Biolice

loves your environment
bilocie is made, using a process unique in the bioplastics market, from whole cereal grains and from a number of specific Limagrain maize varieties. Limagrain’s researchers and technicians have achieved the optimum alliance between Limagrain plant genetics and the processes used by plastic manufacturers. The product’s innovation lies in the combination of cereal fractions with a biodegradable polymer.

bilocie benefits from the “OK Compost” and “Kompostierbar” labels, which, in accordance with standard EN 13432, guarantees the product’s complete decomposition in under twelve weeks with no toxic risk to the environment.

After use and disposal, bilocie products are broken down by micro-organisms. This process produces good quality humus, suitable for use in gardening or agriculture. It is a natural process for re-using waste.

All bilocie materials are:
- authentic because they are made from flour and not starch,
- natural because of our roots in agriculture and plant selection,
- functional because they have practical characteristics which are adapted to both industry and the consumer.
biolice is a material that is 100% biodegradable, 100% compostable, made principally from maize flour and not starch.

More than ten years of patient work have been dedicated to developing naturally the cereal varieties used to make biolice. These maize varieties are key for functionality. Our maize varieties bring significant natural benefits influencing strength, stability, flexibility and texture.

All our cereals are grown in the black soil of the Auvergne in Central France, by our farmer shareholders. All our production is under contract, based on strict specifications and complying with quality criteria that meet the increasing demand for batching, traceability, quality and safety.

A remarkable alliance between plant breeder, farmer, manufacturer and consumer.

Our growers are supported by our crop scientists who understand the huge variation in grain qualities. They develop varieties with the characteristics required by the plastics industry for applications such as, extruded, heat-formed or laminate products.

Together, they ensure the environment is protected within an efficient, sustainable and low input agricultural system. The result of these unique partnerships enable our customers to reap the benefits of what our plant breeders have sown, and produce a "tailor made" product that reflects Limagrain’s strong reputation for cereal innovation.
Flexible applications

Bags
- Dustbin bags, green waste bags, compost bags
- All retail shopping bags
- Liners for wheeled bins
- High quality bags with coloured compostable masterbatches

The biolice benefits for your finished products...
- Natural texture,
- A soft and silky feel,
- No electrostatics,
- No cold sensation to the touch,
- Good optical properties,
- Good processability,
- Strength, stability, flexibility,
- Resistant to fats, water and most organic solvents
- GMO free
- and... a pleasant cereal odour.

Biolice can be used in existing industrial processes without the need for modification or investment.

Better tear resistance than PE
12 - 200 μm
Mono layer & co-extrusion
Flexible applications

Industrial films
(single layer or co-extrusion)

- Mulch films for agricultural, horticultural and market garden use
- Films for seaweed and mud therapy (thalasso)
- Free films for heavy duty sacks
- Packing films and laminating films
- Stretch film and stretch hoods
- Protective sheaths and covers
- Netting
- Safety tapes

Proven on 1000’s of hectares of crops
Strength and durability
Soft & silky feel
Rigid applications
Thermoformed products
- Thin wall packaging
- Trays, containers and plant pots
- Multi-cell and standard seed trays
- Injection for retail products

Shaped extruded products
- Cotton buds

Shatter proof & strong
Temperature resistant -40 °C ~ 80 °C
Process friendly
Since its creation, Limagrain’s strategy has been to develop the production of added value cereal crops in the limited locality of its member farmers in the Limagne. We control the production of all of our maize from seed and have created a unique site, where seed processing, grain storage and transformation into biolice granules are situated together to limit transport and protect traceability.

Maize, an ecologically efficient plant
Maize is the most widely cultivated grain in the world, ahead of both wheat and rice. Discovered by Columbus in the 15th century, “maíze” has since travelled around the world, adapting to all climates and latitudes.

Maize is a plant that combines immense possibilities. Its formidable ability to capture CO$_2$ emissions makes it an important ally in the fight against global warming. Particularly efficient in photosynthesis, maize also has the extraordinary ability to capture the sun’s rays and transform them into biomass, providing it has enough water to grow. It uses water parsimoniously (40% more efficiently than wheat).

The equation between life and maize (average data):[^2]

1 ha of maize + 25 t of CO$_2$ + 7 t of H$_2$O = 17 t of biomass + 17 t of O$_2$

Farmed crops have a positive effect on the environment overall, due notably to the storage of carbon (from solar energy) via photosynthesis.

One hectare of maize absorbs 20 to 30 tons of carbon and supplies two to four times more oxygen than one hectare of forest.

Paradoxically, maize has a reputation for high water consumption when, in fact, nothing could be further from the truth.

[^2]: During a year, 1 hectare of maize produces 13 to 20 tons of biomass, captures 20 to 30 tons of carbon dioxide (CO$_2$) and releases 13 to 20 tons of oxygen (O$_2$) while using only 4 to 10 tons of water (H$_2$O). Source: AGPM.

[^3]: Evapotranspiration: combined water lost through evaporation from the soil and plant transpiration.

[^4]: Biomass: mostly carbon dioxide, expressed in tons of dry matter after dehydration of water.
**Biodegradability**

The word “bioplastic”

“Bioplastics” is a new term with no precise definition. It generally refers to both plastics made from renewable resources (i.e. plants) and biodegradable plastics. Everything therefore depends on the objective… this can be the use of renewable resources, it may be that the raw material used will be the focus of interest, if, however, the objective is biodegradability, then focus will be on the end-of-life options for the product and therefore on materials that meet the applicable standards in force for that product.

**Certifications and labels**

Biodegradability labels and certifications are inspected and are based on standard NF EN 13432. They have been created by private companies but are inspected by an external, independent and accredited body. Several types of certification have been put in place. The Belgian label “OK Compost”, German label “Kompostierbar”, and American label “Compostable” attest to the biodegradability of products under industrial composting conditions. All of these labels guarantee the safety of the final compost.

**Glossary**

**Biodegradable material**

According to the standards in force, a biodegradable material is one which naturally decomposes under the enzymatic action of micro-organisms, resulting in bioassimilation. The result of this degradation is the formation of water, CO₂ and/or CH₄ and possibly some by-products (residues, new biomass) which are not toxic for the environment.

**Compostable material**

This is a material which breaks down through a biological process when composted, producing CO₂ and/or CH₄, water, inorganic components and biomass at a similar pace to other known compostable materials, and does not produce any stable or recognizable toxic residue.

**Fragmentable material**

This is a material which breaks into fragments that may be visible to the naked eye – but persistent in the environment – under the effect of successive physical and/or chemical and/or biological phenomena. *Assimilation by residual micro-organisms has never been proven.*

**Oxo-degradable material**

This is fragmentable material, wrongly referred to as oxo-biodegradable, which is made up of polyethylene chemically a very stable synthetic polymer and combined with starch and/or oxidizing agents that enable it to fragment in UV rays and high temperatures. These materials are not compostable.

**Standard NF EN 13432**

Established in the context of Directive 94/62/EC on packaging and packaging waste, the standard NF EN 13432 lays down the requirements and methods which allow packaging and packaging materials to be composted. The characteristics to be tested and acceptance criteria are the control of the constituents, ultimate biodegradability by disintegration under biological treatment, characterisation of eoxic effects and quality of the final compost. This method limits the test time frame to 6 months, after which the rate of biodegradation of the material must be greater than or equal to 90% of the rate of biodegradation of the reference substance, tested at the same time.