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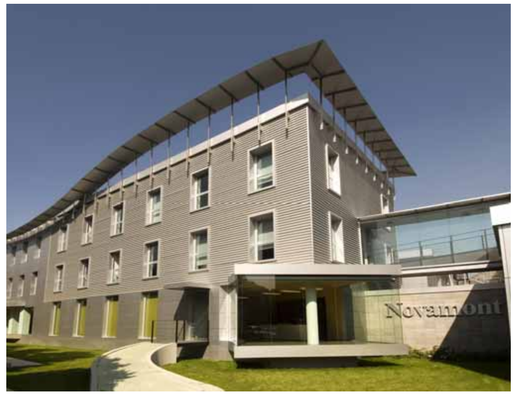
## A success story.

Since 1989, Novamont, pioneers in the bioplastic sector, have invested over 120 million euros in developing a broad range of products for specific applications, containing renewable vegetable raw materials, with the aim of combining the environment, industry and agriculture.
With a constant commitment to producing new materials from renewable sources and systems that have a limited environmental impact, Novamont have become an internationally recognised leader in this sector and a model of a company that cares about environmental, ethical and cultural aspects.
Novamont's basic philosophy is that the environment is something that can propel the development of a business that is economically sustainable and competitive on a large scale.
Novamont was formed with this spirit and it keeps its pioneering approach and the passion of the working team intact, continually achieving new quality standards that safeguard man and his environment. Today, Novamont is the largest European company that produces bioplastics using vegetable components.

Europäisches Patentamt
European Patent Office
Office européen des brevets

Inventor of the year 2007




## An evolving project.

Novamont produce families of biodegradable plastics created using patented technologies developed in the fields of starches, cellulose, vegetable oils and combinations of these. These bioplastics are sold under the names Mater-Bi® and Origo-Bi® and are the first results of the project "Living Chemistry for Quality of Life". Thanks to the experience gained, Novamont are now introducing another evolution to their development model, the "bio-refinery integrated into the territory". This model uses locally-produced, renewable raw materials in an integrated production cycle to make products that come from the earth and return to the earth, thereby activating the whole sector of chemistry from renewable sources.

## Respecting the environment.

Every material is the result of a careful analysis of the whole reference system which includes the product, the sector in which it is used and the land, in all of the life cycle phases. The assessment includes production, distribution and disposal costs, as well as environmental and social costs. The performance of Novamont products, which is assessed using the same system logic, demonstrates economic advantages with the utmost respect for the environment.

## Certified quality.

All commercially available grades of Mater-Bi® are certified biodegradable and compostable in accordance with international and Italian regulations (EN13432, ASTM 6400, UNI 10785, EN14995), by officially recognised organisations, such as Vinçotte (OK Compost), DIN-CERTCO (Kompostierbar), IIP (Istituto Italiano Plastici – the Italian Institute of Plastics), BPS (Biodegradable Plastic Society, Japan) and BPI (Biodegradable Products Institute, the USA).

The "OK Compost Home" certificate guarantees that certain Mater-Bi® films biodegrade completely in lo-tech home composting bins and the "OK Biodegradable SOIL" certificate guarantees that the grades of Mater-Bi® for mulching biodegrade into the soil.

AIAB (a member of IFOAM) and DEBIO have certified that the mulching films made of Mater-Bi® are suitable for use in organic farming.

Some grades of Mater-Bi® have obtained the Environmental Product Declaration (EPD) in accordance with the Swedish EPD system, which has set the international reference level for certification in accordance with ISO standard 14025. The EPD document contains detailed, credible and verifiable information about the environmental performance of the life cycle of products and services, using Life Cycle Assessment (LCA) methods.
The compostable bags made of Mater-Bi® bring about a progressive reduction in the weight of waste thanks to the loss of water vapour through transpiration, which is in accordance with the UNI standard 11185.

Furthermore, Novamont have obtained ISO 9001-2000 quality certification and ISO 14001 environmental management certification.

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Novamont
Living Chemistry for Quality of Life.

# Mater-Bi®: the original.

Novamont
Living Chemistry for Quality of Life.

## MATER-BI®: OUR FIRST RESOURCE.

This is the first family of biopolymers that use vegetable components, such as starch from maize, potatoes and other starchy crops. Through a process of "complexing" the starch with a variable amount of complexing agents (natural, from renewable sources, from synthetic or mixed sources), a variety of molecular superstructures capable of equalling or exceeding the performance of traditional plastics are created. In addition they have the advantage of being completely biodegradable and compostable, thereby keeping the environmental impact to a minimum.

## ORIGO-BI®: NEW TECHNOLOGY, NEW PERFORMANCE.

This family of polyesters, created from vegetable oils, is the result of combining Novamont's research on raw materials of natural origin and, in part, the Eastman Eastar-Bio technology. Origo-Bi® increases the range of properties of the various grades of Mater-Bi® and improves their technical, economic and environmental characteristics.


# FILM

PROPERTY RANGE

| | |
|---|---|
| Young's Modulus | 100 - 1000 MPa (ASTM D882) |
| Elongation at Break | 200 - 1000 % (ASTM D882) |
| Tensile Strenght at Break | 20 - 40 MPa (ASTM D882) |
| Water Vapour Transmission Rate | 100 - 1500 [(g*30µm)/(m²*24h*atm)] (ASTM E96) |

APPLICATION & TECHNOLOGY

**Agriculture:** Mulch Film

**Bags:** Waste Bags (kitchen and garden)

**Shoppers:** T-shirt, Patch-handle, Loop-handle

**Packaging:** Wrapping, FFS, Wicketed Bags, Flow Pack, Shrink Film, Cling Film

**Hygiene:** Backsheets, Topsheets, Wrapping

**Lamination:** Packaging, Food Serviceware, Hygiene, Geotextiles

# FOAMS

PROPERTY RANGE

| | |
|---|---|
| Density | 10 - 70 kg/m³ (ASTM D3575) |
| Solubility | Water-soluble and water-resistant grades available. |

APPLICATION & TECHNOLOGY

**Consumer Packaging:** Thermoformed Unsoluble Punnets

**Industrial Packaging:** Soluble Sheets and Loose Fillers

**Industrial Application:** Insulation

**Toys:** Soluble Sheets and Loose Fillers

# INJECTION MOULDING

PROPERTY RANGE

| | |
|---|---|
| Young's Modulus | 100 - 3300 MPa (ASTM D638) |
| Elongation at Break | 2 - 400% (ASTM D638) |
| Tensile Strenght at Break | 20 - 40 MPa (ASTM D638) |

APPLICATION & TECHNOLOGY

**Agriculture:** Clips, Nursery Pots, Slow Release Devices

**Pet Toys:** Bones, Chewing Items

**Food Serviceware:** Cutlery

**Gadgets:** Pens, Give-aways

**Packaging:** Cosmetics, Food, Industrial, Housings

# EXTRUSION

PROPERTY RANGE

| | |
|---|---|
| Young's Modulus | 100 - 3000 MPa (ASTM D638) |
| Elongation at Break | 2.5 - 800 % (ASTM D638) |
| Tensile Strenght at Break | 20 - 40 MPa (ASTM D638) |

APPLICATION & TECHNOLOGY

**Extrusion Coating/Lamination:** Food Serviceware, Consumer and Industrial Packaging, Labels

**Sheets and Profile Extrusion:** Consumer and Industrial Packaging, Agricultural Items

**Net Estrusion:** Consumer and Industrial Packaging, Protective Items, Geotextiles

**Fibres:** Fabrics and Non Wovens