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The Company

Chemistry at the Service of a System-Based Economy

Novamont is an industrial company whose roots lie in the Montedison School of Materials Science and which was set up in 1989 with a view to implementing the ambitious project of some research workers from the large industrial chemistry group: to integrate chemistry, agriculture and the environment. Ever since it was set up, Novamont has encouraged a new model of sustainable development and the transition from a product-based economy to a system-based economy, from a dissipative to a conservative approach to resources, through the use of renewable energy sources for the production of bioplastics for specific applications with a low environmental impact.

Vision

The challenge for the future is to develop an innovative production and consumption model that conciliates socioeconomic and environmental sustainability to ensure the well-being of the future generations.

Mission

“Living Chemistry for Quality of Life”

Developing materials and bio-chemicals through the integration of chemistry and agriculture, by starting up third-generation biorefineries in the area and providing application solutions that ensure efficient use of resources with advantages for the social, economic and environmental system throughout its life cycle.

Production and Research Centres

Novara

Central office, research laboratories and pilot plants (monomer and polymer synthesis, rheology, mechanical characterization, physical and chemical characterization, plastic transformation technologies, biodgradation, vegetable oil and carbohydrate chemistry, biotechnology applied to chemicals, product ecology and environmental footprint, and engineering).

Terni

Production plant (Mater-Bi® grades and Origo-Bi® polyesters), laboratories (process engineering, quality control), compounding technology, oil treatment, polymer synthesis at a pilot plant level.

Number of Employees

About 250, 7 of whom are based at the overseas marketing offices.

Approach to Innovation

Novamont’s innovation strategy is based on the concept of a third-generation biorefinery, fully integrated into the local community and dedicated primarily to the production of bioplastics and chemicals from renewable energy sources. The efficient use of resources and synergism with local biodiversity represent the pillars of the Research and Innovation policy and the development of new markets and products by the company. A fundamental component of Novamont’s innovative activity is thus focused on identifying autochthonous crops that can be grown on marginal and non-irrigated land in order to favour specific local features and increase the fertility of the land and, at the same time, maximize the use of waste and residues as input and raw materials for the biorefinery.

Third-generation biorefineries are based on an approach of close collaboration with the world of farming, research and local institutions in which the area becomes a laboratory capable of absorbing system-based innovation processes and thus increasing the potential for growth of the entire community. The new biorefinery model also offers a major opportunity for converting decommissioned sites and, at the same time, strengthening the leadership of European companies in the field of biomaterials.

Investments in RD&I Projects

Novamont reinvests all its profits in Research, Development and Innovation projects and the construction of new plants and plants for demonstrating innovative technologies built on decommissioned industrial sites.

Over the past 3 years, Novamont has increased its R&D expenditure by 62%. In particular, expenditure for its R&D staff has increased by 46% over the past 3 years and more than doubled over the past 5 years.

Business Ethics and Social Profile

Since 2008 Novamont has published a yearly Sustainability Report following the guidelines of the Global Reporting Initiative (GRI Reporting Framework), in which it describes the company’s performance in terms of the three main types of sustainability: environmental, economic and social sustainability. Since 2010, the Novamont Sustainability Report has reached the highest level of conformance with the GRI guidelines: A+. Also in 2010 Novamont adopted a Code of Ethics, which illustrates the set of values that the company recognizes, accepts and for which it defines corporate responsibilities inside and outside the company. Novamont employees are expected to respect the Code of Ethics to guarantee the good functioning, reliability and reputation of the company, factors that together form a wealth that plays a decisive role in the company’s success.

Stakeholders

With a view to encouraging a system-based, comprehensive approach to its innovation processes, Novamont continuously conducts relations of synergistic collaboration with a series of important stakeholders such as: suppliers, customers, shareholders, trade associations, interest groups, private foundations operating in the reference areas, local, national and international institutional partners, financial partners, journalists, schools and universities, non-governmental organizations and so on.
Types

Mater-Bi®
This is a family of innovative bioplastics based on plant components and biodegradable polymers totally or partially obtained from renewable energy sources. Under the trademark Mater-Bi® Novamont produces and sells various kinds ("grades") of biopolymers. The plant components are of various kinds (cellulose, glyceral, natural fillers and non-genetically modified starch obtained from various crops) and are all extracted from plantations that do not exploit virgin or deforested land.

For example, corn starch, traditionally one of the first plant components to be used in Mater-Bi®, is a substance that has been widely used for decades as an industrial additive to produce a large number of products such as paper. The corn used is not genetically modified and is grown in Europe following the normal agronomic practices adopted by European farms. It is extracted directly from the grains and subjected to physical changes designed to maintain its natural characteristics. This makes the process efficient, reducing the use of resources to a minimum. The grades of Mater-Bi® containing starch are covered by a wide range of patents and present highly diversified structures in which the starch either forms a complex with the other polymer components or presents a very fine dispersed morphology, which make the products particularly tough.

Other grades of Mater-Bi® do not contain starch but simply biodegradable polymers produced using raw materials coming from renewable sources or fossil-derived raw materials. The substances obtained from fossil resources are only used when their renewable equivalents are not available on an industrial level. Vegetable oils used as a raw material for polymers come from non-genetically modified crops (no use is made of palm oil or soybean oil).

Origo-Bi®
This is a family of polyesters obtained from vegetable oils. They are semi-finished products for the chemical industry used in the production of Mater-Bi® to improve its technical, economic and environmental characteristics.

Properties of Mater-Bi®

The properties of Mater-Bi® grades vary considerably. As regards their mechanical properties, the products range from those with a low modulus and extremely high toughness to stiff products that tend to be brittle. As for their transparency, the products range from lacistescent to transparent. All commercial grades may be transformed using blow moulding, casting, extrusion/thermoforming and injection moulding machines for traditional plastics. With regard to their biodegradability, the commercial products are all certified in accordance with the European and international standards by accredited Certifying authorities that guarantee biodegradation in various disposal environments. Mater-Bi® waste may therefore be recovered through "biological recycling" (that is, composting and anaerobic digestion) together with kitchen and garden waste. Biodegradation in household compost and soil is also guaranteed for many grades. The biodegradability of the waste can certainly not be taken as an excuse for dumping it in a wood or the sea but, if an accidental spillage takes place, Mater-Bi® will undergo biodegradation even in the marine environment.

The environmental profile of Mater-Bi® grades is evolving continuously, in line with the development of the Novamont biorefinery model, which is based on continuous integration with the prior agricultural production stage. Second-generation products integrating starch technology with plant-derived polyester technology are currently available on the market. The products and processes are constantly improved using the "Life Cycle Assessment" (LCA) approach. The year 2014 will see the launch of 3rd and 4th generation products that integrate the chemicals produced by the new Joint-Ventures of Novamont in the fields of green chemistry (Matrica) and biotechnology (Mater-Biotech) and that will further reduce the environmental impact of Mater-Bi®. All grades of Mater-Bi® realize their full environmental potential when they are used in applications in which their excellent performance brings advantages to the system both during their use and at the end of their life. In this sense, rather than being considered a simple replacement for traditional plastics, this class of products should be seen as an opportunity to redesign them from a systems-based point of view, focusing attention on the efficient use and recovery of the resources.

Applications

Novamont concentrates its application development activities in fields in which its products can make a tangible contribution to the efficiency with which the resources are used. This principle is valid both for the field of biodegradable and compostable bioplastics and for that of durable bioplastics. In the former case, Novamont has developed applications in which biodegradability and compostability represent an added value (e.g. catering products “contaminated” with leftovers, which is unlikely to be recycled or would be antieconomic to recycle) and/or serve a function (e.g. mulch sheeting).

An application that belongs to the latter category is the use of Mater-Bi® as a biofiller for tyres (as a partial replacement of carbon black and silicon), in which the fundamental aspect is what Mater-Bi® can do to minimize fuel consumption and CO2 emissions in the transport sector.

The main fields of application of Mater-Bi® are: farming, retail purchasing, disposable crockery, separate waste, industry (personal hygiene and cosmetics, automotive, packaging, animal accessories, gift items).

Reference Standards and Certifications

Main reference standards
Europe: European norm EN 13432 (packaging applications)
European norm EN 14995 (plastics)
United States: ASTM D-6400
Australia: AS 4736
Japan: GreenPLA system

Biodogradability and compostability certificates
“CIC Compostable” (CIC-Certuality, Italy), “OK Compost”, “OK Compost Home”, “OK Compost Soil” (VINCOTTE, Belgium), “Compostable” (DIN CERTCO, Germany), “Compostable” (BPI, United States)
Third-Generation Biorefinery

The Novamont biorefinery is a third-generation biorefinery, whose primary objective is to produce high-value chemicals from a wide range of local raw materials (waste or dedicated crops) in full respect of local biodiversity.

The farming, academic and industrial worlds collaborate closely and continuously in the Novamont biorefinery project. One of the company’s strategic developments is represented by the expansion of the Integrated biorefinery project that was launched in Porto Torres by Matrica, the Joint-Venture between Novamont and ENI Versalis.

The objective is to set up and manage a new “Green Centre” on the petrochemical site in Porto Torres. The site, destined to become the first and one of the largest third-generation integrated biorefineries in the world, dedicated principally to the production of chemicals, will use Novamont proprietary technologies and renewable raw materials to produce biomonomers, biolubricants, biofillers, biological semifinished products/additives for elastomers and bioplastics.

The project has the ambition of establishing synergistic relationships with the local community (farming, industrial and academic worlds), thus activating a competitive growth process in the region.

Biotechnology Platform

Another central and synergistic point in the development of Novamont’s bioplastics portfolio is the creation of the first biotechnology platform in Italy for the production of chemicals from renewable resources. The project benefits from the excellent partnership with Genomatica, a leading U.S. company in the development of microorganisms for the production of semifinished chemical products coming from renewable energy sources.

The creation of a 80/20 contractual Joint-Venture between Novamont and Genomatica, called Mater-Biotech together with the purchase of the former BioItalia plant, will enable Novamont to produce bio-Butandiol on an industrial scale for the first time and to use this semifinished product to support the development of Novamont bioplastics.

Case Studies

Separate waste collection

With a view to encouraging good practices in the field of separate organic waste collection, Novamont collaborates in numerous projects involving local authorities across Italy and Europe. These projects comprise special toolkits for informing the public about the benefits for the system and the planet Earth and the advantages of practising separate waste collection in everyday life using biodegradable and compostable bags.

Catering

Mater-Bi® catering materials represent a unique opportunity for collective caterers: they simplify disposal after consumption, reducing industrial costs considerably as disposable crockery, due to its biodegradability and compostability, can be composted with organic waste, thus drastically reducing the environmental impact with respect to non-recyclable waste. Novamont is committed to promoting low environmental impact events with the use of biodegradable and compostable cutlery, plates and cups (for example, the International Taste Fair, Slow Fish, the London 2012 Olympics). Its aim at these events is to publicize good practices in the field of separate waste collection and to maximize reuse, recycling and environmentally responsible behaviour, by increasing the awareness of the public and the local authorities.

Mulch

The use of Mater-Bi® mulch sheeting offers an agronomically and environmentally efficient alternative to traditional plastic sheeting. In fact, the farmers’ production times are respected in that the Mater-Bi® sheets do not have to be removed and biodegrade in the soil, turning into a natural fertilizer. Mater-Bi® sheets also present huge environmental benefits compared to traditional plastic sheeting in terms of reducing CO2 emissions. Agriculture and innovation thus become a combination capable of bringing benefits to the everyday life of the farming world.
Sources and Official Documents

http://www.novamont.com/


Environmental position 02-IT of 16/10/2008, Mater-Bi® and food crops (http://www.novamont.com/detail.asp?c=1&p=0&id=803)

Environmental position 03-IT of 24/03/2011, Information on raw materials (http://www.novamont.com/detail.asp?c=1&p=0&id=805)