Company Overview

NatureWorks LLC is the first commercial scale manufacturer and global supplier of a family of 100% renewably based performance biopolymers, which it markets under the Ingeo™ brand name. The company has the capacity to meet the growing business and consumer demands for attractive, affordable and renewably sourced, products that can be made from this new generation of nature based plastics and fibers.

- The company was created to lead the commercial market adoption of plastics and fibers made from 100% annually renewable resources.
- It is the owner of the patented technologies that produce a family of Ingeo biopolymers on an industrial scale, with a world scale facility in Nebraska, USA, capable of producing a name-plate capacity of 140,000 metric tons (~ 300 million lbs) per annum for use in plastics and fibers production.

Technology Overview

NatureWorks' Ingeo biopolymer is derived from abundant 100% annually renewable plant resources.

- Carbon is captured in these plant resources, sequestered from the atmosphere during plant photosynthesis and stored in the starch found in the grain of the plant.
- This starch is then converted into natural sugars.
- NatureWorks LLC uses these plant sugars, or dextrose, from a simple existing supply stream as their raw base material.
- Through a process of fermentation, separation and polymerization, the carbon and other elements in these natural sugars are transformed into Ingeo.

NatureWorks’ intellectual property is protected through ~300 granted patents, with a further 100 pending.

Environmental Credentials

Ingeo bioplastics are a significant step towards a better future.

- Replacing petroleum with an annually renewable resource for the production of plastics and the fibers reduces fossil fuel dependency and is a positive step toward carbon-neutral manufacturing and more sustainable processes and products.
- Ingeo biopolymer is the world’s first polymer showing a significant reduction in greenhouse gas emissions. NatureWorks LLC’s production system achieves near greenhouse gas neutrality through its proprietary production technology.
- By replacing petroleum with a renewable plant-based feedstock, NatureWorks’ production of Ingeo uses significantly less non-renewable energy, and generates significantly lower CO2 emissions than all traditional oil based polymers. Compared
to PET for example, Ingeo reduces fossil fuel usage by 47% and greenhouse gas emissions by 59%.


**Manufacturing Overview**

NatureWorks LLC is the largest commercial industrial manufacturer of biopolymers dedicated to eco-innovation through its production, management mission and socially responsible values. The manufacturing plant is located in Blair, Nebraska.

The journey to commercialization:

- 1999 – 4,000 metric ton pilot plant
- 2000 – 8,000 metric tons in (doubling the capacity of the pilot plant)
- 2002 – World scale manufacturing facility installed with 140,000 metric ton capacity footprint and first, 70,000 ton line commissioned
- 2002 – Winner of the US EPA’s Presidential Green Chemistry Challenge
- 2003 – World’s largest lactic acid plant of over 400 million pounds, comes on line
- 2004 – Record production and record rates recorded
- 2005 – Published peer reviewed Eco-Profile based on operational data
- 2006 - 2008 – Purchased Renewable Energy Certificates to offset all non renewable energy used for entire 2006 production, drastically reducing greenhouse gas emissions.
- 2009 – Implemented new production technology to further improve environmental footprint, obviating the need for renewable energy certification.
- 2009 – Full 140,000 metric ton capacity online, with commissioning of 2nd 70,000 ton line.
- 2010 – Initiated site selection assessment for a 2nd Ingeo plant
- 2011 – Awarded the “Leader of Change” award by the Foundation for Social Change and the United Nations Office for Partnerships
- 2011 – Attracts $150 million equity investment from PTT Chemical

**The Product**

Ingeo biopolymer is used uniquely to create a full and diverse range of finished consumer lifestyle goods marketed under the Ingeo brand name. Bridging both plastics and fiber categories, Ingeo is fueling innovation and spearheading a whole raft of creativity across a wide range of products from clothing to home wares, and personal care products to natural plastic food packaging, automotive, consumer electronics and durable goods.

The unique selling position of these products rests on the three basic principles of responsible innovation, and these elements combine to offer a unique choice to both manufacturers and more importantly consumers who are looking for better choices.

- Ingeo performs well and often better than incumbents in many of its applications.
- Ingeo represents highly contemporary innovative science but also has very attractive aesthetics, combining better choices without compromise.
• Ingeo is derived from nature, made by man, bringing the best of both worlds together in a new more responsible reality that respects human choices and the environment at the same time.

For the full Ingeo biopolymer eco-profile and Ingeo brand brochures showcasing key product innovations, please visit www.natureworksllc.com. Here you will also find more complete information on performance and attributes relating to the full range of products available today.

The Ingeo Brand

Ingeo: ingenious materials made from plants, not oil.
Ingeo is fast becoming the ever-present better choice for fresh contemporary and responsible living. The brand represents a commitment to offering better choices and a new business reality that comes from this invention, bringing a new meaning of how to do business differently today. Ingeo represents the realization of a simple mission: to make contemporary goods with a natural origin, to bring performance without compromise and to make products that have a powerful environmental message to the consumer who is looking for a means to choose better.

Ingeo innovations.
New products for better choices.
Better for the planet, so better for the consumer and business too.

NatureWorks LLC provides a comprehensive brand policy with clear guidelines designed exclusively for the use of our licensed Partners to help them best represent and safeguard their own product innovations and the Ingeo brand in the market today.

Ingeo Innovations Include

• Natural plastics for new food eco-packaging in both rigid and flexible film formats
• Disposable foodservice ware
• Protective and display packaging
• Gift cards, security cards, display signage
• Casings for personal care and cosmetics
• Casings and moldings for electronics, durable appliances and automotive parts
• Fiber and textile products for apparel. Contemporary sport, essentials and fashion
• Fiber and textile products for the home. Draperies, furnishing, fiberfill, carpets and mattresses
• Fiber and textile products for the garden: weedblock, land conservation, seeded mulches
• Nonwoven based products for baby care, diapers, wipes and personal hygiene
The NatureWorks LLC Business

NatureWorks LLC is successfully moving its products into the global marketplace showing:

- Continued adoption into new markets, new geographies, and new product sectors.
- Continued positive growth year-on-year, even during a period of severe global economic downturn, with 20-40% annual growth 2009-2010
- A truly global business with activity being split across the Americas, Europe and the Asia/Pacific region.

All of this is only possible through the efforts of our partners numbering more than 100 brands and retailers selling in 70,000 stores worldwide. For the most current description of commercial product offerings at both trade & retail, please see www.natureworksllc.com.

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