Biodegradable Plastic

US Industry Study with Forecasts for **2012 & 2017**

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Demand will be driven by growing initiatives for greater use of sustainable resources, and by enhanced performance properties resulting from better polymerization and blending techniques.

US demand to grow 15.5% annually through 2012

Demand for biodegradable plastic in the US is projected to rise more than 15 percent annually to 720 million pounds in 2012, valued at $845 million. Although representing less than one-half of one percent of all thermoplastic resin demand in 2007, biodegradable plastic will have substantial growth opportunities, helped by growing initiatives for greater use of sustainable resources. Biodegradable plastic demand is also being broadened by enhanced performance properties brought about by more sophisticated polymerization and blending techniques. Standards have also been set for many types of biodegradable plastics, with growing pressures to limit packaging waste and further develop a composting infrastructure.

Polyester-based, polylactic acid types to lead gains

Demand for starch-based plastic will increase 16.8 percent per year through 2012 as a result of improved resin blends and opportunities in such areas as compostable yard and kitchen bags, as well as foodservice items such as plates, bowls and cutlery. PLA demand will expand nearly 20 percent per annum through the forecast period due to capacity additions and broadened applications brought about by resin improvements, as well as greater processor familiarity. Good opportunities are expected for PLA in areas such as thermoformed food packaging (e.g., clamshells and round containers) and bedding and apparel fibers.

Demand for polyester-based biodegradables will exhibit rapid annual growth of nearly 25 percent through 2012. Gains will reflect significant capacity advances, a more competitive pricing structure and opportunities in film and fiber products, such as compostable yard bags and pallet wrap, as well as fibers for apparel and nonwoven fabrics. Polyester-based biodegradables also have good synergy in blends with PLA and starch-based resins. Photodegradable plastic demand will expand at a slower pace through the forecast period as a result of maturing ring carrier uses and competition from paperboard cartons and shrink film.

Packaging to remain best market opportunity

Packaging, which accounted for nearly three-quarters of all biodegradable plastic use in 2007, will present the largest gains through 2012 due to good growth in areas such as foodservice products and film goods. Fiber markets will exhibit rapid growth, mainly in bedding, apparel and nonwoven areas. Further fiber advances will be constrained by the entrenched position of traditional materials such as cotton. Other biodegradable plastic uses include carpet, coatings and injection and blow molded products.

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Sample Text, Table & Chart

TABLE IV-1

BIODEGRADABLE PLASTIC DEMAND BY MARKET
(million pounds)

Item	1997	2002	2007	2012	2017
Nondurable Goods Expend (bil 2000$)					0
lbs biodegradable/mil $ expend					8
Biodegradable Plastic Demand					0
Packaging					0
Nonpackaging					5
Fiber					0
Other					5
$/lb					2
Biodegradable Plastic Demand (mil $)					5

SAMPLE TABLE

MARKETS

Fiber

Fiber markets for biodegradable plastics are predicted to triple through 2012 to [illegible] the gr[illegible] ability of PLA and pol[illegible]. Fib[illegible] ments and lower fiber [illegible]nces. and apparel will rema[illegible]ther u[illegible] ing carpet, nonwovens[illegible]trol b[illegible] netting.

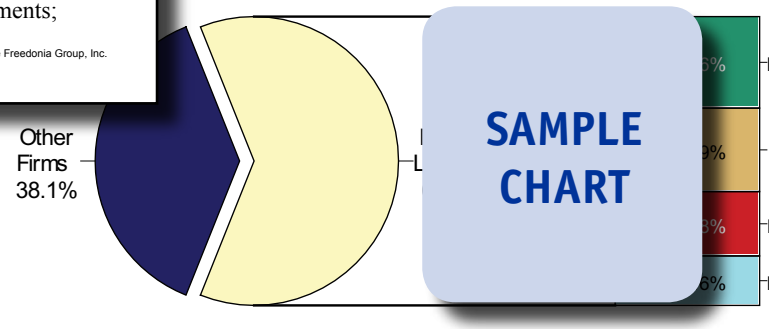
SAMPLE TEXT

NatureWorks is the leading producer of biodegradable fibers under the INGEO brand name. The name INGEO means "ingredients from the earth." The fiber, produced from the firm's polylactic acid, can be used as a stand-alone fiber, as well as in blends with cotton, wool or viscose. Applications include bedding (e.g., pillows), apparel (e.g., shirts), carpet and shoe lining. PLA fibers exhibit high strength, dimensional stability and resiliency. Blends of PLA with cotton or wool result in lighter weight garments that better absorb moisture and are more effective at wicking away moisture from the skin. INGEO products will fully degrade in industrial compost systems, similar to cotton, at the end of their useful life. The fiber is also compatible with standard waste disposal systems such as recycling, landfill and incineration. On the downside, INGEO fibers suffer from a relatively low dye uptake and poor colorfastness. Polyester-based fibers will also be used in the production of biodegradable fibers when supply increases and prices decline.

Other biodegradable fiber producers include American Excelsior, which makes a number of erosion and sediment control products designed to reduce soil erosion and sediment loss during construction and other activities. The firm's CURLEX blankets are made of barbed, interlocking EXCELSIOR Aspen fibers that are held together by photodegradable or biodegradable plastic netting. Applications include highway embankments; residential, commercial and industrial developments;

CHART V-1

[illegible]EGRADABLE PLASTIC MARKET SHARE, 2007
($470 million)



SAMPLE CHART

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Sample Profile, Table & Forecast

TABLE III-2

BIODEGRADABLE/COMPOSTABLE PLASTIC DEMAND BY TYPE (million pounds)

Item	1997	2002	2007	2012	2017
Nondurable Goods Exp (bil 2000$)	17				990
lbs biodegradables/mil $ nondurable					59
Biodegradable/Compostable Demand					40
Starch-Based					10
Polylactic Acid					85
Cellophane					35
Polyester-Based					70
Other					40
$/lb	2				04
Biodeg/Compost Demand (mil $)					83
% biodeg/compostable	1				1.5
Biodegrad Plastics Demand (mil lbs)					260

SAMPLE TABLE

COMPANY PROFILES

Cortec Corporation
4119 White Bear Parkway
St. Paul, MN 5
651-429-110
http://www.c

Annual Sales
Employment:

Key Products gs and related products

SAMPLE PROFILE

Cortec Corporation is a privately held supplier of environmentally friendly corrosion control, packaging, and aerosol chemical products. The Company operates through several divisions and businesses, including the Advanced Films, Coated Products and Spray Technologies divisions.

The Company participates in the biodegradable plastics industry via the Advanced Films division (Cambridge, Minnesota). Through the division, Cortec manufactures a variety of high-performance plastic films, bags and related products, including biodegradable and compostable varieties. In general, the Company's biodegradable and compostable plastic items are designed to retain their strength and physical properties until they are disposed of in soil or composting environments. Once disposed, these products will decompose into carbon dioxide and water within weeks. The Company makes its biodegradable and compostable films and related products under such brand names as ECO FILM, ECO WRAP, ECO-CORR, ECO WORKS and ECO-TIE.

ECO FILM products are designed to replace non-biodegradable, starch-based and polyethylene films in the production of packaging

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"Food applications for cellophane film will remain dominant and expand 1.4 percent per year to 29 million pounds in 2012. Snacks, baked goods and confections will remain cellophane's forte due to the film's excellent machinability (enabling high production rates), a wide heat seal temperature range, low electrostatic levels, durability, versatility, stiffness, high gloss, eye appeal, clarity and good deadfold characteristics."

--Section III, pg. 85

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Other Studies

Natural Polymers

The study analyzes the US natural polymer industry. It presents historical demand data for 1997, 2002 and 2007 and forecasts to 2012 and 2017 by product (e.g., methyl cellulose, carboxymethyl cellulose, wheat proteins, collagen, starch blends, xanthan gum, hyaluronic acid, guar gum, gum arabic, carrageenan, alginates, polyterpenes), and market (e.g., food and beverages, medical, oilfield). The study also considers market environment factors, details industry structure, evaluates company market share and profiles industry players.

#2422 ..... 10/2008..... $4600

Engineering Plastics

This study analyzes the US engineering resin industry. It presents historical demand data (1997, 2002 and 2007) and forecasts for 2012 and 2017 by resin (e.g., ABS, polycarbonate, nylon, polyesters, polyacetal, fluoropolymers, PPO, polysulfones, PPS, polyimides) and market (e.g., electrical and electronic, motor vehicles, consumer and institutional, construction). The study also considers market environment factors, details industry structure, evaluates company market share and profiles industry players.

#2404 ..... 10/2008..... $4600

Silicones

US silicone demand will rise 4.2% annually through 2012. Silicone fluids will lead gains based on their tendency to boost the performance of cosmetics and toiletries. The relatively small medical market will outpace all others. Silicone conditioning agents and emollients will be the fastest growing applications. This study analyzes the $3.2 billion US silicone industry, with forecasts for 2012 and 2017 by product, market and application. It also evaluates company market share and profiles major players.

#2385 ..... 07/2008..... $4500

Nanocomposites

US nanocomposites demand will grow 21% annually through 2011 as nanomaterial and composite prices decline. Higher-priced resins, such as engineering plastics used in applications where cost is not a critical factor, will lead gains. Packaging and motor vehicles will remain two key early markets. This study analyzes the $860 million US nanocomposites industry, with forecasts for 2011, 2016 and 2025 presented by product, market and nanomaterial. It also details market share and profiles major firms.

#2303 ..... 02/2008..... $4500

World Thermoplastic Elastomers

Global demand for thermoplastic elastomers (TPEs) will grow 6.3% annually through 2011, as they continue to replace natural and synthetic rubber, rigid thermoplastics and metal. China will gain market share but the US will remain the top producer of some products such as olefinic-based TPEs. This study analyzes the $10.4 billion world TPE industry, with forecasts for 2011 and 2016 by type, market, world region and for 16 countries. It also evaluates company market share and profiles major producers.

#2284 ..... 12/2007..... $5500

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