New study finds:

- Demand for nonwoven roll goods in the US will increase 4.5 percent per year to $4.6 billion in 2005. Advances will be driven by strong gains in most disposables consumer and filtration markets, as well as nondisposables markets such as geotextiles and battery separators.

- Spunbound nonwovens accounted for the largest share of US nonwoven fabric shipments in 2000, benefitting from the development of new applications, as well as strong demand for the composite nonwovens featuring spunbound webs.

- Eight companies -- Kimberly-Clark; DuPont; Polymer Group; BBA (United Kingdom); Johns Manville, a unit of Berkshire Hathaway; Freudenberg (Germany); Ahlstrom (Finland); and Buckeye Technologies -- accounted for 73 percent of total US nonwovens demand in 2000.
Nonwovens, a new study from The Freedonia Group, provides you with an in-depth analysis of major trends in the industry and the outlook for product segments and major markets -- critical information to help you with strategic planning.

This brochure gives you an indication of the scope, depth and value of Freedonia’s new study, Nonwovens. Ordering information is included on the back page of the brochure.

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• Demand for nonwoven roll goods in the US will increase 4.5 percent per year to $4.6 billion in 2005. Advances will be driven by strong gains in most disposables consumer and filtration markets, as well as nondisposables markets such as geotextiles and battery separators.

• Disposable consumer products, which primarily include baby diapers, adult incontinence products, feminine hygiene products and a variety of wiping products such as baby wipes, personal care wipes and household cleaning wipes, will remain the largest market for nonwovens.

• Spunbound nonwovens accounted for the largest share of US nonwoven fabric shipments in 2000, benefitting from the development of new applications, as well as strong demand for the composite nonwovens featuring spunbound webs.

• Polypropylene is the most widely used fiber in nonwoven production, accounting for 42 percent of fiber consumption in 2000. This is also the fastest growing material due to its dominance in rapidly advancing nonwovens such as spunbonded and meltblown nonwovens.

• Eight companies -- Kimberly-Clark; DuPont; Polymer Group; BBA (United Kingdom); Johns Manville, a unit of Berkshire Hathaway; Freudenberg (Germany); Ahlstrom (Finland); and Buckeye Technologies -- accounted for 73 percent of total US nonwovens demand in 2000.
## Study Highlights

### Nonwoven Fabrics Demand

(million dollars)

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<th>Item</th>
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<th>2000</th>
<th>2005</th>
<th>2010</th>
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<td>665</td>
<td>865</td>
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<td>3.3</td>
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### Summary Table

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Market Environment

The Market Environment Section discusses factors influencing nonwovens demand, including consumer spending and demographic trends.

This information provides you with an understanding and an analysis of the climate in which the nonwovens industry operates.

Pricing Trends

Average manufacturers’ prices for nonwovens are forecast to remain steady at $.11 per square yard through 2005. Although the average price of nonwovens per square yard rose slightly from 1990 through 1995, prices fell back somewhat by 2000. These movements were largely a result of a shifting product mix, fluctuating raw material prices, and a competitive pricing environment that made it difficult for manufacturers to change their prices. Various materials cost factors and competitive pressures have generally succeeded in limiting price advances.

Additionally, some types of nonwoven fabrics have also shifted away from being custom produced and have become more commodity-like products, resulting in additional pricing pressure, particularly among lower cost types. Further price reductions will be restrained by ongoing product innovation, particularly among more specialized, value-added products, and the development of new applications for nonwoven fabrics.

Average prices are based on estimates of the value of demand in relation to the total square yardage sold. However, there can be significant differences in price for individual products, depending on the fibers, resins and additives used, as well as the web formation and web bonding processes used. For example, a basic carded, thermal bonded nonwoven made from polyester fibers is less costly than a meltblown, thermal bonded nonwoven made from polyester fibers. This is primarily due to the high energy costs involved with the hot airstreams of meltblown web formation, as well as the fact that meltblowing is a more complex technology in which it is difficult to properly balance the variables.

Individual prices also vary based on the type and availability of materials used in a particular application. For instance, as a result of strong gains in applications such as disposable consumer wipes, the industry has experienced fast growth in production capacity for spunbonded nonwovens and nonwoven webs bonded with...
The Materials and Products Sections provide demand for historical years and forecast growth to 2005 and 2010.

This information helps you:

- Analyze your company’s growth potential in the industry.
- Outline your strategic plans for five and ten years out.
- Establish sales goals.

**Wood Pulp**

In nonwovens, consumption of wood pulp fiber is projected to increase 4.7 percent per year, which will be driven by the popularity and increasing use of hybrid materials such as Kimberly-Clark’s COFORM composite, a meltblown polypropylene and air laid wood pulp. Additionally, pulp benefits from its status as a natural product and its position as the leading fiber used in air laid and wet laid nonwovens. Further advances will be restrained by the presence of significant price fluctuations due to the cyclical nature of the pulp market.

Wood pulp used in nonwovens is primarily composed of softwood such as southern pine and hemlock due to their high quality and high level of absorbency. Pulp is used in wet laid and pulp-based air laid nonwovens, which feature a higher pulp content compared to wet laid nonwovens. With its short fiber length, pulp is not suitable for other types of web formation such as carding or textile air laid. Additionally, pulp can be combined with other fibers for more specialized hybrid products. For instance, pulp can be spunlaced with longer polyester fibers for applications in medical fabrics, or with light weight polypropylene spunbonded nonwovens for additional strength in spunbonding applications. The pulp industry has also benefitted from the increasing use of chlorine-free, environmentally friendly, oxygen bleaching processes, particularly in tea bags, coffee filters and other applications.

The primary advantage of pulp is its high level of absorbency. First, the fiber itself is a hollow tube which collapses upon drying. Second, the cooking treatment used in pulping allows for high absorbency. The fiber is also relatively strong. The leading performance disadvantage for pulp is its stiff, brittle feel, which feels less like textiles and more like paper. To counteract this problem, pulp is often blended with synthetic fibers for a softer hand. Additionally, pressure and thermal...
The Market Sections analyze trends and consider the threats and opportunities in disposable and nondisposable nonwovens markets.

The information presented will help you:

- Focus your sales and marketing efforts on high growth areas.
- Propose new areas for development.

**DISPOSABLES MARKETS**

**Wipes - Nonwoven Fabric Demand**

The US market for nonwoven wipes is considered to be in its infancy, a new market compared to the wipe markets of Japan and Western Europe, which are more established. The consumer wipes market is forecast to increase from $380 million in 2005 to $2 billion in 2010, primarily resulting from a strong increase in the number of wipe products available. Additional value gains will result from the use of higher value added nonwoven materials in many of these new wipe products. Concerns about the number of wipes ending up in landfills are expected to be addressed by the introduction of a growing number of flushable wipes as well as emphasis on the biodegradability of many wipes. Further growth will be restrained by the high cost of many of these wipe products compared to the much lower cost of a cleanser applied to a substrate such as a wash cloth or paper towel by the end user.

Although most of these types of wipes are single-use disposable products, some are short-life disposable wipes. This means that they can be reused a few times, but not washed and reused. For example, Polymer Group’s CHiX brand wipes are absorbent, rinsable and reusable for one to three days and feature MICROBAN (Microban) antimicrobial treatment to inhibit growth of mold, mildew and bacteria.

A variety of nonwoven materials are used to produce wipes for the consumer market. The fibers most widely used in the production of wipes include cotton, rayon, polypropylene, polyester and wood pulp. Bicomponent fibers are also used for certain specialty applications, such as facial cleansing wipes. Air laid, carded and spunbonded nonwovens are the materials which are primarily used as wipes.

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**Industry Structure**

Gain a better understanding of your competition and analyze your company's position in the industry with information about:

- industry structure
- market share
- competitive strategies
- research & development
- manufacturing
- distribution
- marketing
- mergers & acquisitions
- cooperative agreements

**Research & Development**

Research and development expenditures and activities remain an important aspect of the nonwovens industry, in stark contrast to most other parts of the textile industry. In fact, these activities have become even more important as many manufacturers shift away from lower margin products which have become commodity-like, and toward higher margin, more specialized and custom-produced nonwovens. Ongoing research and development have resulted in nonwovens that are stronger, more absorbent, lighter weight and less expensive, enabling companies to enter markets traditionally dominated by conventional textiles.

For instance, the development of innovative hybrid nonwoven webs has led to the introduction of nonwoven fabrics which feature the performance advantages of more than one type of nonwoven. Examples include spunbonded and meltblown webs sandwiched into SMS composite nonwovens which are stronger, lighter weight and more uniform compared to most single web nonwovens. The addition of more meltblown layers in the middle results in a loftier nonwoven.

The development of new nonwoven products is primarily driven by the desire to gain share of traditional textile markets such as apparel and to increase the use in nonwovens in additional components of more mature nonwoven markets such as diapers. For instance, in 2000, Freudenberg introduced its EVOLON continuous fiber spunbonded and spunlaced nonwoven fabric. The endless filaments mean the fabric will not fray and can be cut and sewn without using seams or hem finishes. EVOLON, which is being marketed for high performance athletic clothing, general apparel and outerwear, is designed to be an easy-care fabric which is washable, quick drying, wrinkle resistant, breathable and ultraviolet resistant. The material is also light weight, providing warmth similar to comparable wovens and knits but with 40 percent less weight. Further developments include versions made with fibers other...
Company Profiles

The Profiles Section analyzes 38 companies active in the U.S. nonwovens market. These profiles represent a sampling or cross-section of the types of companies involved in the industry.

Divisions, subsidiaries, joint ventures, etc., are discussed under appropriate parent companies.

Sources for profiles included:

- Information provided by key staff members in the respective companies
- Annual reports
- 10-K reports
- Security analysts reports
- Corporate product literature

Buckeye Technologies Incorporated
1001 Tillman Street
Memphis, TN 38108
901-320-8100
http://www.bkitech.com

Buckeye Technologies is a manufacturer of cellulose-based products. The Company’s products are organized into three categories: chemical cellulose, customized paper cellulose and absorbent products. In FY 2001, Buckeye Technologies had sales of $732 million and employed 2,150.

Buckeye is active in the US nonwovens industry through the manufacture of customized paper cellulose and absorbent products. Buckeye believes it is the only manufacturer of cellulose-based products made from both wood and cotton using air laid and wet laid technologies. In October 1999, Buckeye acquired UPM-Kymmene Walkisoft GmbH (Germany), a manufacturer of air laid nonwovens. In the US, Walkisoft operated a plant in Mount Holly, North Carolina. In addition to the company’s facilities, the purchase included the WALKISOFT, AIRSPUN and ACQUILINE nonwovens brands, which are used in the manufacture of moist wipes, tabletop and feminine hygiene products, as well as for medical applications. In the US, manufacturing operations are conducted in Memphis, Tennessee; Perry, Florida; and Lumberton, King and Mount Holly, North Carolina. A distribution facility is located in Savannah, Georgia. Outside of the US, Buckeye’s nonwovens are produced in Canada, Brazil, Germany and Ireland.

The Company’s offers a number of absorbent products made primarily using the air laid process. This process allows cellulose fibers to better absorb liquids, making these nonwovens feasible for use in diapers, baby wipes and similar products. In July 2001, Buckeye commenced production on a new machine at its Mount Holly
Companies Profiled

Nonwovens #1487

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Freedonia does not just collect and reprint data; Freedonia develops data. Our analysts thoroughly investigate an industry by extensively interviewing key industry participants and analyzing information from sources such as associations, government and trade literature. Once this research is complete, Freedonia establishes one set of forecasts. All writing, editing and forecasting is done in-house to assure quality and consistency. In cases where data does not exist, Freedonia develops the data based on input/output ratios, bills of materials and flow charts. The following chart summarizes Freedonia’s methodology:
The Freedonia Group, Inc. is a leading international industry study/database company.

Since 1985, Freedonia has published over 1,600 titles covering areas such as chemicals, coatings and adhesives, building materials, plastics, industrial components and equipment, health care, packaging, household goods, security, and many other industries.

Freedonia has produced a wide variety of titles, including:

- Disposable Medical Supplies
- Coated Fabrics
- Roofing
- Textile Processing & Finishing Chemicals

Because Freedonia is a reliable information source, our forecasts are cited in numerous publications such as The Wall Street Journal, Adhesives & Sealants Newsletter and Purchasing.

In-house operations
Because all of our staff work at the same location, interaction between analysts and departments provides a strong system of checks and balances.

Consistency
Our Economics Group develops indicators that are used by all analysts. Therefore, every Freedonia study is based on a consistent set of economic assumptions (GDP, resident population, manufacturers’ shipments, etc.)

Reliable forecasts
Because all of our forecasts consider the environment in which a product or industry is operating, as well as threats and opportunities to the market, Freedonia forecasts are reliable indicators of future performance.

One-on-one interviews
All studies are produced by conducting interviews with key industry participants and end-users.

Proprietary electronic database
Freedonia’s analysts can tap into an extensive in-house electronic database containing corporate literature (including private company information), trade publications, government reports and many other sources of information.

About
The Freedonia Group

Advantages
of Freedonia Reports

Nonwovens #1487

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About Our Customers

Freedonia’s clients include major US and international companies in the manufacturing, services, consulting and financial sectors.

Typical purchasers of Freedonia studies:

- Key Executives
- Corporate Planners
- Market Researchers
- Financial Analysts
- Information Centers
- New Product Developers
- Merger & Acquisition Specialists

Since 1985 we have provided research to customers ranging in size from global conglomerates to one person consulting firms. More than 90% of the industrial companies in the Fortune 500 use Freedonia research to help with their strategic planning.

Some of Freedonia’s customers in the nonwovens market include: Ahlstrom, DuPont, Johns Manville and Kimberly-Clark.
Disposable Medical Supplies
The US market for disposable medical supplies will grow 6% annually through 2005. Gains will be lead by prefilled inhalers; prefilled syringes; transdermal patches; and hematology, nucleic and immunochemistry diagnostics. Home health care will be the fastest growing market as consumers broaden self treatment and preventive medicine activities. This study analyzes the $48.6 billion US disposable medical supplies industry to 2005 and 2010 by type and market. It also evaluates market share and profiles key firms.

#1484. 11/01. $3,900

Filters
Demand for filters in the US will grow 4.8% annually through 2005. Fluid filters will surpass motor vehicle filters as the largest segment based on continuing gains in high efficiency membranes. Consumer water filters will also do well based on increased water quality concerns. Growth in air filters will be driven by gains in pollution control filters and consumer products. The study analyzes the $7 billion US filters industry to 2005 and 2010 by product and market. It also evaluates market share and profiles key firms.

#1475. 9/01. $3,800

Coated Fabrics
Growth in the US coated fabrics market will be driven by solid demand in motor vehicle air bag fabrics, protective clothing, marine and aerospace equipment, awnings and commercial tents. Vinyl will remain the dominant coating while rubber-coated fabrics grow the fastest. Polyester will remain the top substrate while nylon leads gains. This study analyzes the $2.5 billion US coated fabric industry to 2005 and 2010 by type, substrate and market. It also evaluates market share and profiles key companies.

#1466. 9/01. $3,700

Batteries
Primary and secondary battery demand in the US will grow 6.6% through 2005. Gains will be fueled by continuing technological innovation, increases in demand for battery-powered devices and a shift in the product mix toward more expensive batteries that offer superior performance. Primary lithium, zinc-air and alkaline batteries will offer the best prospects. This study analyzes the $10.4 billion US batteries industry to 2005 and 2010 by product and market. It also evaluates market share and profiles key firms.

#1447. 7/01. $3,800

Dyes & Organic Pigments
The US market for dyes and organic pigments will reach $3.1 billion in 2005. Organic pigments, having become the dominant segment in 2000, will continue to lead growth. Gains will be led by the development of high performance and other specialty pigments for water-based inks, powder coatings and radiation-curable inks and coatings. This study analyzes the 590 million pound US dyes and organic pigment industry to 2005 and 2010 by type and market. It also presents market share data and profiles key firms.

#1439. 6/01. $3,700

Glass Fibers
Demand for glass fibers in the US will reach 6.8 billion pounds in 2005. Best opportunities are expected for textile glass in reinforced plastics applications based on advantages over competitive materials (e.g., light weight, corrosion resistance, favorable cost/performance profile). Demand for fiberglass insulation will slow due to decelerating housing starts. This study analyzes the $5.4 billion US glass fiber industry to 2005 and 2010 by product and market. It also details market share and profiles key companies.

#1428. 6/01. $3,700

Carpets & Rugs
Demand for carpets and rugs in the US will reach 2.2 billion square yards in 2005. Advances will be fueled by healthy repair and improvement spending in both residential and nonresidential sectors. Gains will also be stimulated by product innovations (e.g., built-in stain resistance, recycled content) and high-style products aimed at baby boomers. This study analyzes the $12.4 billion US carpets and rugs industry to 2005 and 2010 by material, product and market. It also presents market share data and profiles key firms.

#1396. 3/01. $3,600

Nonwovens

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