US Industry Study with forecasts to 2008 & 2013

Activated Carbon

US demand to grow 4.3% per annum through 2008

US demand for virgin activated carbon is forecast to expand 4.3 percent per annum to 475 million pounds in 2008, valued at $315 million. The activated carbon market is volatile, with spikes in demand related to the enactment of environmental legislation or routine changeouts of spent carbon, as well as economic upswings. Activated carbon is used primarily as an adsorbent to remove organic compounds and pollutants from liquid and gas streams; thus the market is heavily impacted by the implementation of various environmental regulations.

Laws such as the Clean Water and Clean Air Acts, as well as activated carbon’s low cost and excellent performance, drive demand in many large volume markets such as municipal and industrial water treatment, and industrial air purification. As most pollution control systems stemming from the Clean Water and Clean Air Acts have been in place for several years, the majority of activated carbon demand in these applications will be dedicated to the replacement requirements of existing systems. To a lesser extent, demand will benefit from municipalities upgrading antiquated water treatment systems.

Targeted new regulations to benefit powdered and granular types

While major pieces of environmental legislation have been in place for several years, additional regulations targeting specific industries are occasionally implemented. The implementation of various proposed environmental regulations will provide opportunities for activated carbon through 2008.

In particular, granular activated carbon will benefit from a larger number of motor vehicles requiring emission canisters, while powdered activated carbon will be increasingly used in the removal of mercury from gas streams in industrial applications.

Market forces to also drive gains

Growth will also depend on continuing product development, such as material dedicated to consumer end uses (e.g., odor control agents in cat litter) and for the production of electrodes designed for ultracapacitors and fuel cells. In addition, increased consumer concerns over indoor air quality in motor vehicles and residential settings will provide opportunities for activated carbon, since this material is often used to adsorb air contaminants.

Moreover, the continued penetration of consumer water purification systems and the replacement requirements of existing systems will provide favorable opportunities for activated carbon since it is a commonly used filtration material. Activated carbon demand will also be promoted by a rebound in food and beverage shipments, where this material can be used during the processing stage.

Study coverage

Details on these and other key findings are available in the 244-page Freedonia industry study, Activated Carbon, priced at $4100. It provides historical US demand data (1993, 1998, 2003) plus forecasts to 2008 and 2013 by product and application. The study also examines the market environment, discusses supply and demand, details industry structure, presents company market share data and profiles selected industry competitors.

Visit www.freedoniagroup.com for tables of contents & complete text & tables
Activated Carbon Demand

Freedonia Industry Study
#1839 - “Activated Carbon”

TABLE IV-4
GRANULAR ACTIVATED CARBON DEMAND BY TYPE & APPLICATION
(million dollars)

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<tr>
<td>Activated Carbon Demand</td>
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<td>% GAC</td>
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<td>Granular Activated Carbon Demand</td>
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<td>By Type:</td>
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<td>Traditional</td>
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<td>Specialty (e.g., extruded)</td>
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<td>By Application:</td>
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<tr>
<td>Liquid Phase Applications</td>
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<td>Food &amp; Beverage Process</td>
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<td>Other Liquid</td>
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<td>Gas Phase Applications</td>
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<tr>
<td>Emission Canister</td>
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<td>Air Purification</td>
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<td>Other Gas</td>
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Supply & Demand

Gains in value demand will benefit from a gradual shift to value-added products. Pricing, for example, will continue to recover from the segment’s performance in the mid- to late-1990s, when pricing was depressed due to overcapacity and low demand in China and other nations in the Asia/Pacific region. Although imports from the Asia/Pacific region are likely to continue on the US market, rising operating costs and an emphasis on higher value-added products will likely promote pricing increases. As such, average GAC prices are forecast to increase 3.8 percent per pound per annum through 2013.

PAC to GAC...

Historical data through 2003 plus Freedonia forecasts to 2008 and 2013

TABLE III-7
ACTIVATED CARBON SUPPLY & DEMAND
(million pounds)

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<td>lbs activated carbon/mil $ GDP</td>
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</table>

This study can help you:

- Determine your market & sales potential
- Complement your research & planning
- Learn more about industry competitors
- Assess new products & technologies
- Identify firms to merge with or acquire
- Gather data for presentations
- Confirm your own internal data
- Make better business decisions

(continued on opposite page)
Activated Carbon Demand

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<td>320</td>
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<td>475</td>
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<tr>
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<td>By Type:</td>
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<tr>
<td>Air Purification</td>
<td>Emission Canister</td>
<td>Solvent Recovery</td>
<td>Other Gas Phase</td>
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<tr>
<td>% gas phase</td>
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**GAS PHASE APPLICATIONS**

**Industrial** — Demand for activated carbon in industrial air purification applications is forecast to expand 3.1% per year to 7.3 million pounds in 2008. Proposed regulations in many industries that use activated carbon to purify air will provide favorable opportunities through 2008. Proposed regulations for volatile organic compounds (VOC) and ozone will continue to be a driver of activated carbon applications, particularly those mandated by the Occupational Safety and Health Administration (OSHA) and worker and union stipulations. However, many of these indoor air quality mandates will limit gains through 2008.

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**Company Profiles**

**Asbury Carbons Incorporated** (Asbury, New Jersey) makes a variety of graphitic and a variety is privately held. The Company is active in the US activated carbon industry through Asbury Carbons’ Cummings-Moore Graphite Mills and Asbury Carbons Incorporated subsidiaries. Among other carbonaceous products, Cummings-Moore (Detroit, Michigan) offers coconut shell activated carbon. The activated carbon is purchased from various companies located in the Asia/Pacific region. Further processing of this activated carbon, in the form of screening and grinding, is conducted at a plant located in Detroit, Michigan.

Asbury Carbons Incorporated makes a variety of carbon and graphite products at facilities located in Asbury, New Jersey and Kitanning, Pennsylvania. These plants offer a range of processing equipment for the crushing, sizing, grinding and blending of carbon and graphite materials for use in cast metals and industrial applications. Specific products made by the company include the 5562 and 5588 grades of activated carbon, which are supplied to manufacturers of such friction products as brake linings, clutch facings and specialty friction materials.
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Consumer Water Purification & Air Cleaning Systems
US demand for home water purification and air cleaning will grow 5.6% annually through 2008. Filters will remain the top water purifier while reverse osmosis and distillation lead gains. Electrostatic air cleaners will remain dominant. Point-of-use systems define the water segment while portability is key in air cleaning. This study analyzes the US consumer water purification and air cleaning industry to 2008 and 2013 by product and regional market. It also profiles major producers and assesses market shares.

#1829................08/2004 .....................$4100

World Activated Carbon
World demand for activated carbon will grow 5.2% annually through 2007, driven by growing industrial output and water treatment applications. Best prospects exist in the emerging industrial economies. In developed regions, Japan will lead volume gains while Western Europe paces value growth. This study analyzes the $1.9 billion US biocide industry to 2008 and 2013 by product, function and market. It also evaluates market share and profiles leading players.

#1825................07/2004 .....................$4100

Membrane Separation Technologies
US membrane materials demand will grow 8.3% annually through 2008, driven by rising penetration into water and wastewater treatment and food and beverage processing. Polymeric membranes will remain dominant while nonpolymeric types grow the fastest. Ultrafiltration and reverse osmosis applications will lead gains. This study analyzes the $1.8 billion US membrane materials industry to 2008 and 2013 by type, application and market. It also evaluates market share data and profiles key companies.

#1799.................05/2004 .....................$3900

Nonchemical Water Treatment
Demand for nonchemical water treatment equipment and supplies in the US will grow 7.2% annually through 2007. While filtration and separation will remain dominant, disinfection will lead gains as UV radiation and ozone generating equipment are used to reduce reliance on chlorine and other chemicals. This study details the $4.1 billion US nonchemical water treatment industry to 2007 and 2012 by market (municipal, industrial, residential) and by product. It also evaluates market share and profiles major firms.

#1738...............12/2003 .....................$3900

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