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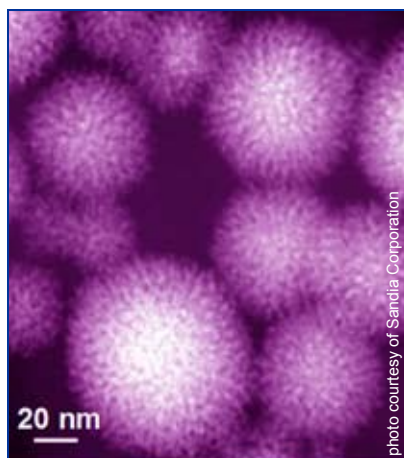
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World Nanomaterials

Industry Study with Forecasts for **2011, 2016 & 2025**

Study #2215 | August 2007 | \$5500 | 473 pages



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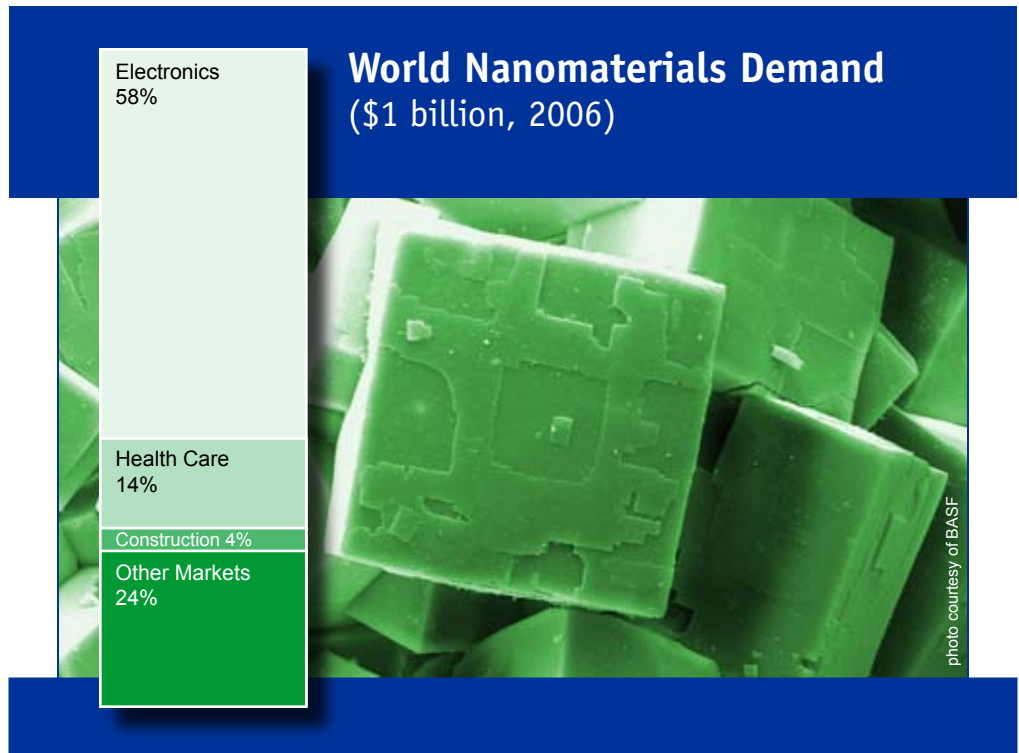
Initial outlets for nanomaterials include silicon wafer polishing slurries, superstrong plastic composites, transparent sunscreens, self-cleaning glass, and high-end sports equipment.

Global demand to reach \$4.2 billion by 2011

While still only scratching the surface of their considerable commercial potential, nanomaterials have established an appreciable market presence -- \$1 billion -- mainly in the United States, Western Europe and Japan. By 2011, world demand for nanomaterials is forecast to reach \$4.2 billion. In the longer term, the global market is projected to swell to \$100 billion in 2025. By then, use of nanomaterials will have expanded well beyond their initial outlets, such as wafer polishing slurries used in semiconductor manufacturing, high performance superstrong plastic composites, transparent sunscreens and other personal care products, self-cleaning glass, and high-end sports equipment.

Nanoscale oxides, metals are commercializing first

Although much of the media coverage and other hype surrounding nanotechnology and nanomaterials have focused on more futuristic applications, the nanomaterials making the greatest initial commercial impact are the less exotic but more widely used nanoscale oxides and metals. Silica, titanium dioxide, alumina, iron oxide, zinc oxide and other nanoscale versions of conventional materials are now finding use in cosmetics, paint, construction materials and electronic equipment. Eventually, these materials will also be widely used in such applications as drug delivery systems,



creating opportunities for safer and more effective dosages of medication to treat cancer and other diseases. In the next decade or two, some of the relatively novel nanomaterials, such as nanotubes and dendrimers, will account for a larger share of overall nanomaterial usage.

Health care to top US, European markets; electronics to remain key in Asia

Although the electronics market is currently the largest outlet for nanomaterials, it is anticipated that health care applications will eventually be the leading global market, reaching \$50 billion by 2025. Use of nanomaterials in health care will be concentrated in the

US and Western Europe, where a large share of the world's pharmaceutical products are manufactured. France and Switzerland are among the countries at the forefront of nanomaterial development for pharmaceutical applications.

Electronics will remain the leading outlet for nanomaterials in the Asia/Pacific region, as a large and ever-growing proportion of electronics production occurs there. Although Japan is currently the largest market in Asia for nanomaterials, China is the fastest growing market and will eventually become the largest in the region. While smaller in terms of global market size, a number of other nations will offer opportunities for nanomaterials.

Sample Profile, Text & Table

COMPANY PROFILES

Nanophase Technologies Corporation

1319 Marquette Drive
 Romeoville, IL 60446
 630-771-6700
<http://www.nanophase.com>

Revenues: International 14%
 Geographical: earth powders
 Employment: s engineered
 Key Products: products and manufac-

Nanophase's engineered products and manufacturing processes have a wide range of applications in a variety of industries. The company's products have unique performance attributes such as transparency, wear resistance and conductivity.

The Company is a leading developer and producer of nanomaterials, manufacturing and supply a variety of nanoscale powders. Nanophase specializes in the creation of nanocrystalline metal oxide and rare earth powders that can be used in a range of applications. The Company typically develops its engineered nanomaterials as solutions for specific customer applications.

Products & Manufacturing Activities -- Nanophase's nanomaterial products, which include both single and multielement oxides, are supplied as nanoparticles, surface-treated nanoparticles and stable nanoparticle dispersions. It uses a range of integrated, patented and proprietary nanotechnologies for the manufacture and processing of nanomaterials. These technologies encompass two nanomaterial production processes, which are known as physical vapor synthesis (PVS) and NANOARC synthesis. Nanophase's PVS process is used to create nanometer-sized crystals of various metal oxide and rare earth materials, which are primarily offered under the NANOTEK, NANOGARD

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TABLE VII-3

JAPAN: KEY INDICATORS FOR NANOMATERIAL DEMAND
 (billion 2005 dollars)

Item	2001	2006	2011	2016	2025
Population (million persons)	127				128
per capita GDP	29				30
Gross Domestic Product	3				35
Manufacturing Value Added					32
Personal Consumption Expenditures	2				35
Construction Expenditures	46				48
\$ nanomaterial/capita					1
Nanomaterial Demand (mil \$)					20

SAMPLE
TABLE

SAMPLE
PROFILE

FIGURE III-3

NANOBALL



SAMPLE
FIGURE

Source: The Freedonia Group, Inc.

Sample Table, Text & Forecast

ASIA/PACIFIC

In terms of national government R&D spending on nanotechnology, Japan is among the world leaders, with annual spending in 2006 of \$1.1 billion. In most of these years, the Japanese government has larger than any nation's other national government. The overall US federal budget for nanotechnology is only and economically advanced nations. Japan has extensive ongoing R&D activities in nanotechnology in other research laboratories and corporate settings. Among the leading Japanese universities with nanotech research programs are the University of Tokyo, Tohoku University, Osaka University, Kyoto University, Tokyo Institute of Technology, Nagoya University and Kyushu University. The University of Tokyo's research undertakings, for example, include the development of a nanowire production process for disagglomerating nanotubes. Kyoto University has hosted projects relating to the production of higher fullerenes and the development of effective nanosensors. The University has also collaborated with a number of firms to develop business card-sized malleable electronic displays.

Among the leading government agencies with nanotechnology programs are the Ministry of Economy, Trade and Industry (METI), the Science and Technology Agency (STA), and Monbusho (Ministry of Education, Science, Sports and Culture). The key national laboratory for nanotechnology is the National Institute of Advanced Industrial Science and Technology (AIST), although several others are also involved. Among AIST's more ambitious undertakings is a ten-year, \$185-million project designed to develop techniques of atomic and molecular manipulation.

TABLE VII-4

JAPAN: NANOMATERIAL DEMAND BY TYPE & MARKET (million dollars)

Item	2001	2006	2011	2016	2025
Gross Domestic Product (bil 2005\$)	3729	4054	4455	4830	5585
\$ nanomaterial/000\$ GDP	0.02	0.04	0.11	0.31	1.13
Nanomaterial Demand					
By Type:					
Oxides					
Clays					
Metals					
Nanotubes					
Other					
By Market:					
Electronics					
Health Care					
Pharmaceuticals					
Other					
Construction					
Energy					
Other					

**SAMPLE
TABLE**

"Demand for nanomaterials in Japan is projected to increase more than threefold to over \$480 million in 2011. By 2025, demand in Japan is expected to exceed \$6.3 billion. Much as in the US, nearly every commercially significant application for nanomaterials is expected to grow substantially over the next decade or two. This will be due in large part to the commitment by Japanese corporations, universities and the national government to undertake R&D projects focused on developing and commercializing nanotechnology-enhanced products."
 --Section VII, pg. 207

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Signature _____

OTHER STUDIES

Glass Fibers

US glass fiber demand will reach \$7 billion in 2011. The dominant glass wool fiber sector will grow the fastest, driven by rebounding demand in office and commercial construction and increasing insulation use per structure to improve energy efficiency. Reinforced plastics will present the best opportunities for textile glass fiber. This study analyzes the US glass fiber industry, with forecasts for 2011 and 2016 presented by type and market. It also evaluates company market share and profiles leading competitors.
 #2199 05/2007..... \$4400

Nanotechnology in Construction

US demand for nanomaterials in construction will reach \$100 million in 2011, and leap to \$1.75 billion by 2025. Coatings will be the largest application, followed by composites and concrete additives. Nanoscale silica, titanium dioxide, and clay will post substantial gains. This study analyzes the US market for nanomaterials in construction, with forecasts for 2011, 2016 and 2025 presented by product, application and market. It also considers market environment factors and profiles leading industry players.
 #2185 05/2007..... \$4500

Industrial Crystals

US industrial crystal demand will grow 5.8% yearly through 2011, led by uses in nonlinear optical materials and compound semiconductor substrates. Communications and security/defense will see the largest market gains. Transition metal-based crystals and semiconducting types will be the fastest growing materials. This study analyzes the \$845 million US industrial crystal industry, with forecasts for 2011 and 2016 by material, application and market. It also evaluates market share and profiles leading players.
 #2166 05/2007..... \$4500

Reinforced Plastics

US reinforced plastics demand will reach 4.2 billion pounds in 2011, driven by broadened applications and enhanced competitiveness with steel and aluminum. Thermoset resins will remain dominant while thermoplastics will grow faster. Glass fibers will stay the top reinforcement material while nanomaterials will lead gains. This study analyzes the \$6.7 billion US reinforced plastics industry to 2011 and 2016 by resin, market and reinforcement. It also evaluates company market share and profiles major players.
 #2195 04/2007..... \$4400

Nanotechnology in Health Care

US demand for nanotechnology medical products will grow 17.5% annually through 2011, driven by the critical need for new or improved therapies and diagnostics. The greatest short-term impact will be in cancer and central nervous system disorders, followed by orthopedic nanoimplants. This study analyzes the \$23.6 billion US nanotech medical product industry to 2011, 2016 and 2021 by material, product and application. The study also reviews product development activities and profiles major players.
 #2168 02/2007..... \$4500

About The Freedonia Group

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