Membrane Separation Technologies

US Industry Study with Forecasts for **2014 & 2019**

Study #2632 | May 2010 | $4900 | 375 pages

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US Industry Study with Forecasts for ***2014 & 2019***

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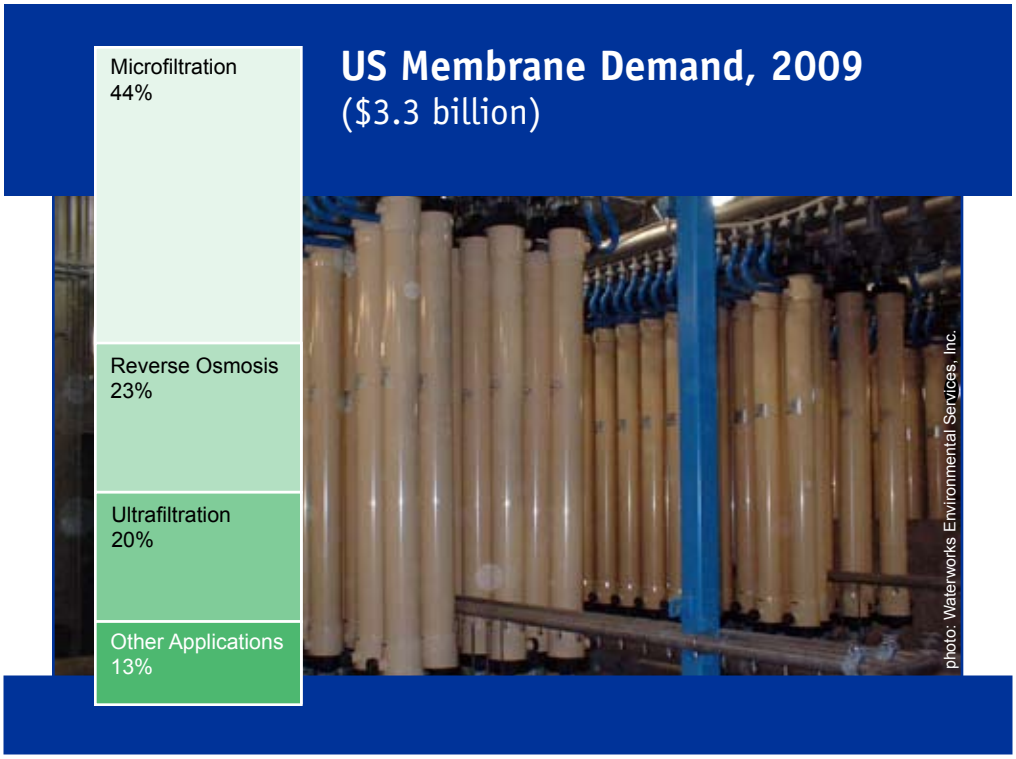
Growth in membranes will be driven by increasingly strict environmental regulations for water and wastewater streams, and greater interest by industries in higher purity process fluids.

US demand to rise 8% annually through 2014

Demand for membrane materials is expected to increase 8.0 percent per year to $4.8 billion in 2014. Growth will be driven by the introduction of increasingly strict environmental regulations for water and wastewater streams, as many of these regulations require purity levels that cannot be achieved with conventional filtration equipment alone. Additional gains will stem from the rising number of industries with interest in process fluids with purity levels that are best reached with membrane separation systems. These factors are leading to the rising penetration of membranes into markets such as water and wastewater treatment, and food and beverage processing.



Nonpolymeric membranes to outpace polymeric

Polymeric membrane materials will continue to dominate the market because of their relatively low initial costs and applicability to a number of products. Cellulosic membranes, the least expensive materials, accounted for the largest share of polymeric membranes -- 57 percent in value terms -- in 2009, although that share is slowly declining as more durable materials become more widely used. However, polymer-based membranes are subject to an increasing level of competition from nonpolymeric membranes because of the former's performance limitations in extreme conditions and a tendency toward biological fouling and clogging. Therefore, demand for nonpolymeric materials, including ceramic, metal and composite types, is expected to record faster growth through 2014, benefitting from better performance in extreme temperatures and greater pH ranges, as well as generally lower maintenance costs.

Ultrafiltration, reverse osmosis among fastest growing applications

As the most established and mature segment of the market, microfiltration membranes are projected to continue to account for the largest share of total demand. However, more rapid advances are projected for ultrafiltration and reverse osmosis membranes, both of which produce higher purity streams. These two segments will also benefit from their ability to highly treat wastewater for re-use and rising interest in brackish water and seawater desalination. Among major applications, gains are expected to be fastest for pervaporation membranes, albeit from a small base. Pervaporation membranes are finding increasing use in high-growth specialty markets such as chemical processing, and medical uses and pharmaceutical manufacturing, as well as fluid treatment in wastewater and industrial gas processing.

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Sample Text, Table & Chart

TABLE VI-1

MEMBRANE DEMAND BY MARKET
(million dollars)

Item	1999	2004	2009	2014	2019
Gross Domestic Product (bil 2005$)					
sq ft membranes/mil $ GDP					
Membrane Demand (mil sq ft)					
$/sq ft					
Membrane Demand					
Water & Wastewater Treatment					
Food & Beverage Processing					
Pharmaceuticals & Medical Uses					
Chemical Processing					
Industrial Gases					
Other Markets					

SAMPLE TABLE

TYPES

Cellulosic Membranes

Demand for cellulosic membranes is expected to advanc
cent per year to 1.4 billion square feet in 2014. Their domina
in the membrane separation market is due in large part to the
the lowest cost option for separation membranes. An additio
tage is their versatility as these membranes can be used in a v
of markets for most separation applications.

Cellulosic membranes are expected to post annual gains
less in line with the industry average through 2014. Further
will be restrained by competition from certain types of better
ing polymers as well as high performance ceramics and meta
of the more advanced separation applications. However, cel
membranes will retain their leading position because of their significant
cost advantages. Additionally, despite the growth of competing materi-
als, many long-time membrane users continue to favor cellulose acetate
membranes because they are familiar with their performance attributes
and the membranes provide sufficient levels of performance for a num-
ber of applications. Advances will be also be aided by increased usage of
these membranes in the food and beverage and water treatment markets,
where they are most commonly used because of their high flow rates.

SAMPLE TEXT

to $ percent annually
gain that for volume
incr membranes is
share grow
For instance, cellulosic membranes used in high value revers
applications are expected to post the strongest advances throu
Further growth will be restrained by the fact that the cellulos
market is more established and mature than other membrane
many manufacturers compete primarily on the basis of price.

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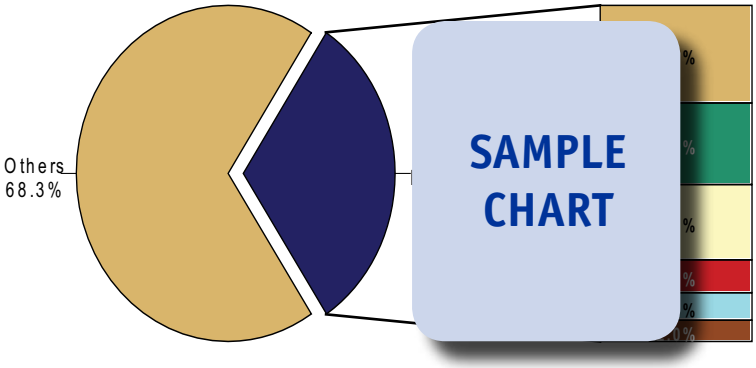
CHART VII-1

US MEMBRANE MATERIAL MARKET SHARE BY COMPANY
($3.3 billion, 2009)



SAMPLE CHART

Sample Profile, Table & Forecast

TABLE V-7

ULTRAFILTRATION MEMBRANE DEMAND BY MARKET
(million dollars)

Item	1999	2004	2009	2014	2019
Ultrafiltration Membrane Demand					465
Water & Wastewater Treatment:					53
Water Treatment					15
Wastewater Treatment					38
Food & Beverages:					35
Foods					10
Beverages					25
Pharmaceutical & Medical					68
Chemicals					08
Other Markets					01

SAMPLE TABLE

COMPANY PROFILES

Medtronic Incorporated
710 Medtronic Parkway
Minneapolis, MN 55432
763-514-4000
http://www.medtronic.com

Sales: $
US Sales
Employr

Key Proc

SAMPLE PROFILE

Me mpany that provides solutions ompany operates through s e Management; Spinal; Neuromodulation; CardioVascular; Surgical Technologies; Diabetes; and Physio Control.

The Company is active in the US membrane separation technologies industry through the CardioVascular segment, which posted sales of $2.4 million in FY 2009. The segment comprises Medtronic's operations for the development and manufacture of a line of minimally invasive products and therapies used to treat coronary artery disease, abdominal and thoracic aortic aneurysms, peripheral vascular disease and heart valve disorders. Products include blood oxygenators sold under the AFFINITY NT, MINIMAX PLUS and ECMO tradenames.

AFFINITY NT blood oxygenators are used to separate carbon dioxide (CO2) from water in the bloodstream, replacing the CO2 with oxygen molecules. These blood oxygenators utilize membranes made from bundles of Medtronic's proprietary plasma-resistant PRF hollow fibers. These bundled membranes minimize blood shear and maintain

"Sales to the chemical, and pharmaceutical and medical markets are expected to achieve the fastest growth through 2014, with 13.2 and 12.6 percent annual gains respectively. Demand in the chemical market will benefit from increasing market penetration and continued strength in chemical shipments. Key applications for ultrafiltration membranes in the pharmaceutical market include the purification of enzymes and other pharmaceuticals, and the separation and concentration of biological components."
--Section V, pg. 120-1

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Other Studies

World Pumps

World fluid handling pump demand will rise 6.5% annually through 2014. The pace of gains will slow in most developing countries, while in industrialized nations pump sales will rebound from depressed 2009 levels. Process manufacturing will be the fastest growing market. This study analyzes the $50.4 billion global pump industry, with forecasts for 2014 and 2019 by product, market, world region and for 34 countries. The study also evaluates company market share and profiles industry participants.

#2676 ..... November 2010 ..... $6100

World Filters

Global demand for filters is forecast to expand 5.1% annually through 2013. Market advances in the developing areas will considerably outpace increases in the US, Western Europe and Japan. Sales of air purification filters will be the fastest growing segment while internal combustion engine and related filters remain the largest. This study analyzes the $45.5 billion world filter industry, with forecasts for 2013 and 2018 by product, market, world region and for 26 countries. It also evaluates market share and profiles industry players.

#2568 ..... November 2009 ..... $6100

World Water Treatment Products

Global water treatment product demand will rise 5.7% yearly through 2013. Large developing markets such as China and India will grow the fastest. Gains in developed areas will be based on efforts to increase water reuse, improve the aesthetic quality of drinking water and further reduce water contamination. This study analyzes the $44.6 billion world water treatment product industry, with forecasts for 2013 and 2018 by product, market, world region and for 23 countries. It also evaluates market share and profiles industry players.

#2563 ..... November 2009 ..... $6100

Nonwovens

Demand for nonwoven roll goods in the US is projected to rise 3.7% annually through 2013. Among disposable nonwovens, consumer items will continue to claim the most sales while the filtration market grows the fastest. Within the nondisposables segment, construction will remain the largest market and grow the fastest. This study analyzes the $5.2 billion US nonwoven fabric industry, with forecasts for 2013 and 2018 by material, product and market. It also evaluates market share and profiles industry players.

#2559 ..... November 2009 ..... $4900

World Water Desalination

Global water desalination demand will grow 9.1% annually through 2013. The Africa/Mideast region will remain the dominant market while the Asia/Pacific region grows the fastest. Technologies such as reverse osmosis membranes and multiple-effect distillation will increase market share. This study analyzes the $8.4 billion world water desalination industry, with forecasts for 2013 and 2018 by technology, product, service, world region and for 17 countries. It also evaluates market share and profiles industry players.

#2523 ..... August 2009 ..... $5700

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