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Membrane Separation Technologies

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

Study #2307 | March 2008 | \$4600 | 349 pages

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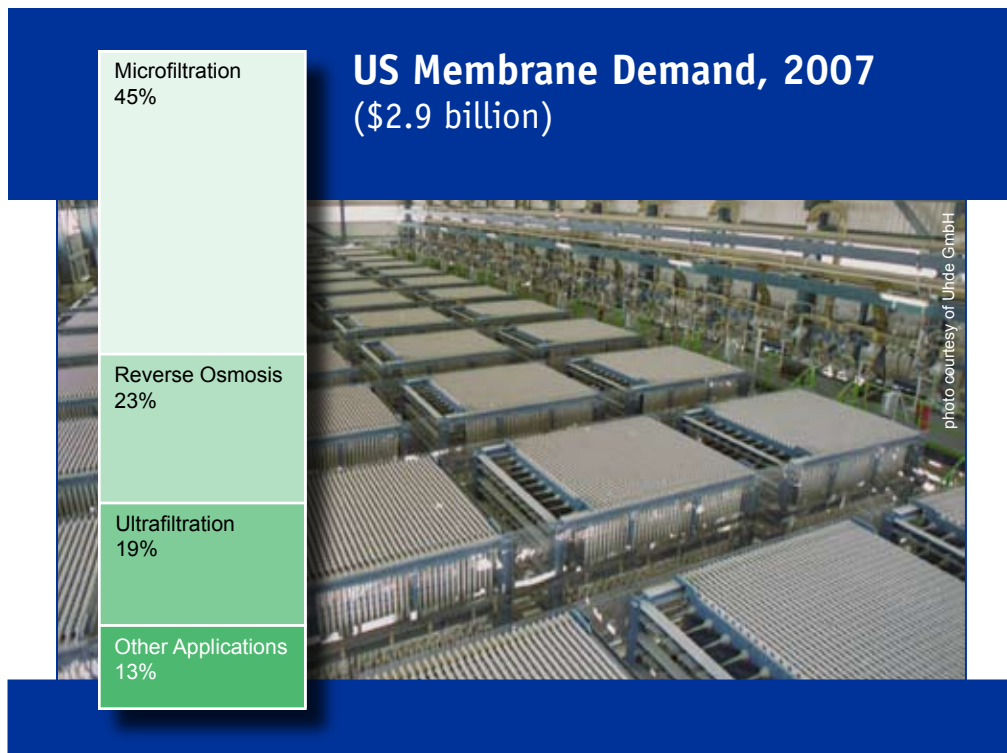
Growth will be driven by ongoing interest in process fluids with higher purity levels in a variety of markets, as well as increasingly strict water and wastewater quality regulations.

US demand to grow 8.2% annually through 2012

Demand for membrane materials is expected to increase 8.2 percent per year to \$4.3 billion in 2012. Growth will be driven by ongoing interest in process fluids with higher purity levels in a variety of markets, as well as the introduction of increasingly strict environmental regulations concerning the quality of water and wastewater streams. These factors are leading to the rising penetration of membranes into markets such as water and wastewater treatment, and food and beverage processing, as industry requirements surpass levels that can be achieved with conventional filtration equipment alone. Additionally, a growing number of industries are using membranes to reduce water use and waste disposal expenditures, and to improve water re-use and material recovery. Value growth will be aided by the increasing use of value-added, high performance membranes, and a gradual shift toward higher value materials.

Ultrafiltration, reverse osmosis to see good growth

Microfiltration membranes will continue to account for the largest share of total demand, but represent a better established and more mature segment of the market. As a result, advances are projected to be stronger for ultrafiltration and reverse osmosis membranes, both of which function in a variety of markets at a higher purity level. However, among



major applications, gains are expected to be strongest for pervaporation membranes, albeit from a small base, because of their use in high-growth specialty markets such as chemical and industrial gas processing, as well as fluid treatment in wastewater, and medical and pharmaceutical markets. Other membrane separation technologies include gas separation, nanofiltration, dialysis and electro dialysis.

Nonpolymeric membranes to outpace polymeric types

Polymeric membrane materials will continue to dominate the market as they have lower initial costs and greater product flexibility than nonpolymeric

materials. However, polymer-based membranes are subject to an increasing level of competition from nonpolymer membranes because of performance limitations, including poor performance in extreme temperatures, intolerance to a number of chemicals and a tendency toward biological fouling and clogging. Demand for nonpolymeric materials, including ceramic, metal and composite types, is expected to record double-digit growth through 2012, due to their better performance in extreme temperatures and greater pH ranges, as well as generally lower maintenance costs since they are better able to withstand the high pressure backwash and/or chemicals involved in cleaning the membrane.

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Sample Text,
 Table & Chart

TYPES

Polymeric Membranes

Consumption of polymeric membrane materials is forecast to increase 6.0 percent annually through 2012. This growth will be driven mostly by the healthy growth for membrane expense of conventional filtration with regulatory criteria in membrane to meet higher performance as pharmaceuticals, food and also be driven by ongoing development of more durable polymeric membranes which are resistant to damage from oxidizing chemicals, fouling and clogging, and can operate in a broader range of temperatures, pressures and pH environments. Additionally, advances will be powered by the low cost of polymeric membranes relative to competitive ceramic, metal and composite membranes.

Further gains will be restrained to some degree by competition from nonpolymeric membranes, such as those made of ceramics and metals, which are two to three times more expensive, but often display better performance characteristics, particularly in extreme environments. These competitive membranes are expected to register much faster growth, but will also continue to account for a much smaller share of the market.

In value terms, demand is projected to advance 7.8 percent per year to \$4 billion in 2012. Several of the major types of polymeric membranes are expected to post subpar growth over the forecast period. Volume growth for higher value specialty polymers is expected to outpace that for more established polymers, such as cellulose, polysulfone and nylon. Additionally, many of these specialty polymer membranes are also forecast to experience modest gains in average prices over the forecast period as they continue to be used in less mature market segments.

SAMPLE
 TEXT

TABLE VI-3

**WATER & WASTEWATER TREATMENT
 MARKET FOR MEMBRANES
 (million dollars)**

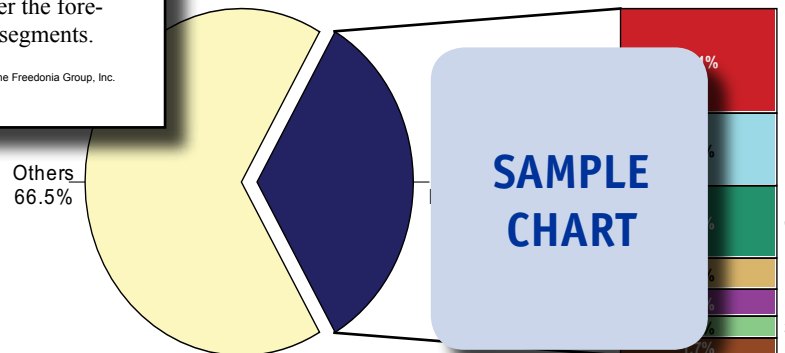
Item	1997	2002	2007	2012	2017
Total Water Use* (tril gal)	1				5
\$ membranes/mil gal					6
Membranes in Water/Waste Treatment				40	65
Water Treatment					75
Wastewater Treatment					
% water				9	
Membrane Demand	1				05

* excludes agriculture

SAMPLE
 TABLE

CHART VII-1

**MEMBRANE MATERIAL MARKET SHARE, 2007
 (\$2.9 billion)**



SAMPLE
 CHART

**Sample Profile,
 Table & Forecast**

TABLE V-6
ULTRAFILTRATION MEMBRANE DEMAND BY TYPE
 (million dollars)

Item	1997	2002	2007	2012	2017
Gross Domestic Product (bil \$)					
\$ ultrafiltration/mil \$ GDP					
Ultrafiltration Membrane Demand					
Cellulosic					
Polysulfone & Nylon					
Other Polymers					
Ceramic & Other					
% ultrafiltration Membrane Demand					



COMPANY PROFILES

Culligan International Company
 9399 West Higgins Road
 Rosemont, IL
 847-430-2800
 http://www.cul

Annual Sales:
 Employment:

Key Products: ...tion systems
 that utilize rev

SAMPLE PROFILE

Culligan International is a producer of water systems that are primarily used to purify water in residential and commercial applications. The Company is a subsidiary of Clayton, Dubilier & Rice Incorporated (New York, New York), a leading global private equity firm.

The Company is active in the US membrane separation technologies industry through the manufacture and sale of residential and commercial water purification systems that utilize reverse osmosis (RO) technologies. Culligan's residential RO systems are sold through the CULLIGAN GOOD WATER MACHINE and CULLIGAN WATER TOWER product lines. For example, the CULLIGAN GOOD WATER MACHINE drinking water system employs a semi-permeable RO membrane to trap most chemicals and many microscopic impurities. This system also incorporates a 5-micron particulate filter to remove larger particulates, as well as a carbon filter to eliminate chlorine, sulfur and other causes of bad taste and odors. The CULLIGAN GOOD WATER MACHINE system is available in sink-mount and under-sink models.

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“Demand for ultrafiltration membranes is projected to increase 9.5 percent per year to \$870 million in 2012. Gains will be driven by increasing interest in the level of fine separation for water treatment or other fluid applications that can be achieved with ultrafiltration membranes. Advances will also be spurred by the growing number of markets that require ultrapure process water -- which can be achieved with ultrafiltration membranes. Demand growth will also benefit from ...”
 --Section V, pg. 112

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OTHER STUDIES

Water Treatment in China

This study analyzes the rapidly growing water treatment market in China. It presents historical demand data for the years 1997, 2002 and 2007, and forecasts for 2012 and 2017 by water treatment market (industrial, municipal, residential and commercial); and product (chemicals, filters, membranes, disinfection, deionization and distillation). The study also considers market environment factors, evaluates company market share and profiles leading industry players.

#2329 04/2008..... \$5100

Filters in China

This study analyzes the Chinese market for filters. It presents historical demand data (1996, 2001, 2006) and forecasts for the years 2011 and 2016 by product type (e.g., internal combustion engine and related filters, fluid filters, air filters); and by market (e.g., transportation equipments, industrial and manufacturing, utilities, consumer). The study also considers market environment factors, reviews filtration technology, details industry structure, evaluates company market share and profiles leading competitors.

#2310 03/2008..... \$5100

World Filters

Global filter demand will climb 5.6% annually through 2011. Developing areas will lead gains based on faster-growing economies and the enactment of stricter environmental laws. China, India and Russia will post some of the strongest sales growth. Air and fluid filters will be the fastest growing types. This study analyzes the \$37 billion world filter industry, with forecasts for 2011 and 2016 by product, market, world region and for 26 countries. It also evaluates company market share and profiles major players.

#2295 03/2008..... \$5800

World Water Treatment Products

Global demand for water treatment products will grow 6.4% annually through 2011. Advances will be the fastest in the developing world, especially China and India. Gains in more established markets will be driven by technology upgrades such as higher-end membranes in desalination and other uses. This study analyzes the \$29.3 billion world water treatment product industry, with forecasts for 2011 and 2016 by product, market, world region and 20 countries. It also details market share and profiles major players.

#2276 01/2008..... \$5800

Nonwovens

US demand for nonwoven roll goods will grow 4.5% annually through 2011, driven by healthy gains in key markets such as filtration, construction and wipes. Spunbonded nonwovens will remain the dominant product based on performance advantages, new applications and more demand for composite nonwovens featuring spunbonded webs. This study analyzes the \$4.7 billion US nonwovens industry, with forecasts for 2011 and 2016 by material, product and market. It also details market share and profiles major firms.

#2271 11/2007..... \$4600

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