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Specialty Gases

US Industry Study with Forecasts for **2013 & 2018**

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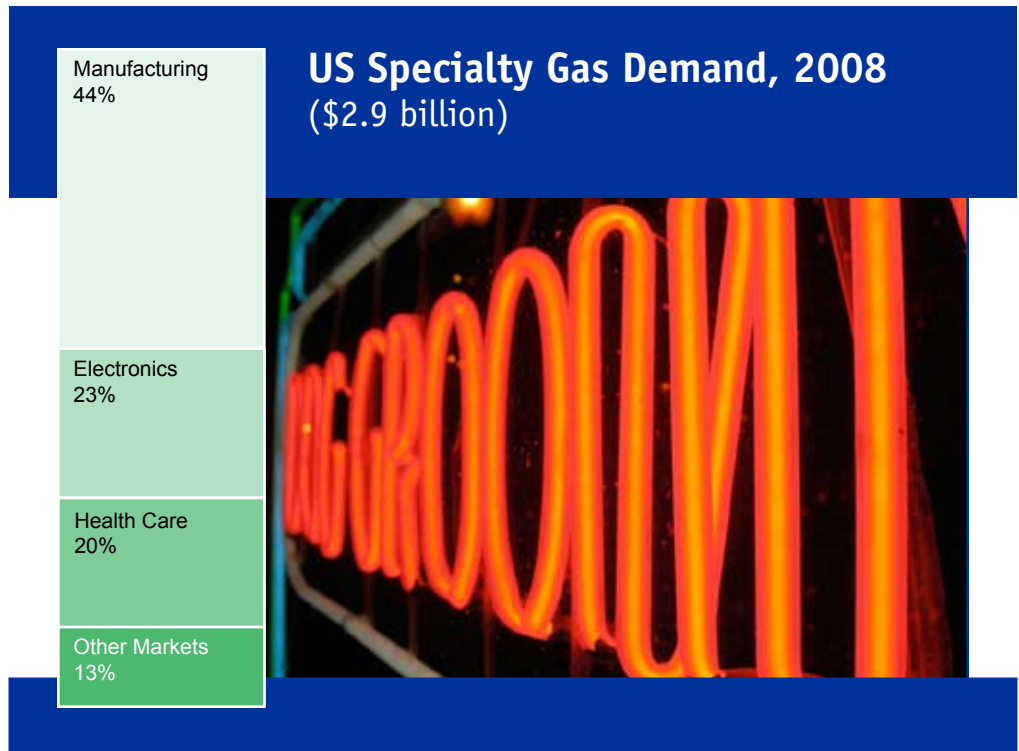
Increased demand for photovoltaic products and plasma display panels in the US will help shore up an otherwise sagging US electronics market for specialty gases through 2013.

US demand to rise 3.5% annually through 2013

Specialty gas demand in the US is forecast to expand 3.5 percent per year to \$3.4 billion in 2013. The manufacturing, electronics and health care sectors together accounted for 87 percent of total specialty gas demand in 2008. The dominance of these sectors will continue, though weakness in the US electronics industry will limit demand for silane gases, high purity nitrogen and hydrogen, halogen gases, and others used in the production of semiconductors and other electronic components. By 2013, the outsourcing of US electronics manufacturing will cause this sector to drop from the second largest consumer of specialty gases to the third largest. Increased demand for photovoltaic products and plasma display panels in the US will help shore up an otherwise sagging electronics market.

Health care industry to be fastest growing market

The health care industry, in contrast, will be the fastest growing specialty gas segment. This industry uses significant amounts of specialty gases in analytical, diagnostic and imaging equipment; for institutional and home respiratory therapies; for equipment and instrument sterilization; for dental and general surgical anesthesia; as imaging contrasts; and in many other applications. Ongoing research into new applications, as well as an aging population, will help



fuel specialty gas demand growth by the health care sector.

Manufacturing will remain the largest consumer of specialty gases, comprising about 44 percent of total demand. Applications for specialty gases in general manufacturing are extremely diverse. The chemical industry uses large quantities of specialty gases as intermediate feedstocks in the manufacture of many chemicals; the food industry uses specialty gases for food processing, packaging and refrigeration; manufacturers of thermal windows use noble gases as fill gases between glass panes; and lighting and laser manufacturers also use significant amounts of specialty gases.

Analytical gases to be fastest growing application

Inert atmosphere/purge gases used, for example, in food processing and semiconductor manufacturing are the largest application for specialty gases, representing 19 percent of demand in 2008. Second by application are specialty gases used for instrument calibration, environmental monitoring and other analytical processes, which accounted for 14 percent of specialty gas demand in 2008. Analytical gases will grow more rapidly than other applications due to the increasing need to monitor pollutants, maximize production efficiency, monitor product quality, render diagnoses, etc.

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Sample Text, Table & Chart

MARKETS & APPLICATIONS

Specialty Gas Demand: Demand for specialty gases in the industry will advance 4.4% to \$107 million in 2008. Growth will be driven by the lighting industry, though the dated shift away from incandescent lighting and compact fluorescent lamps will alter the market. Additionally, the increased use of LEDs will limit the market's growth.

SAMPLE TEXT

Specialty gases serve as fill gases in some lighting bulbs, and demand is still tightly linked to lamp production technology and other factors affecting the lighting industry. As a result, demand will benefit from the shift toward energy-efficient products, which typically contain higher-priced specialty gases, krypton and xenon. However, the biggest such shift will occur as incandescent lamps are replaced in bulk by the more energy-efficient compact fluorescent lamps (CFLs), which for most consumer applications are designed to fit into existing fixtures. In this case, both types of lamps use argon as a fill gas, so argon's role in the lighting market will be affected only insofar as the life expectancy of fluorescent bulbs is much greater than that of incandescents. As a result, gains in the value of argon consumed in this sector will more reflect price increases than growth in volume consumption.

In general, the noble gases will continue their domination of the lighting market in those applications that use gas. However, the maturity of the lighting industry and competition from alternative lighting technologies that do not consume specialty gases in their manufacture will limit demand. For instance, neon tubing will face increased competition from advanced technologies such as LEDs in outdoor lighting markets.

In value terms, xenon and krypton dominate the lighting market for specialty gases, combining for more than 60 percent of the market in 2008. These gases possess superior performance characteristics that are

TABLE IV-18

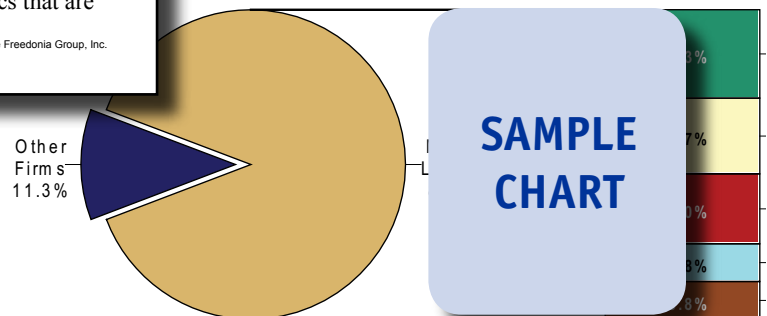
HEALTH CARE MARKET FOR SPECIALTY GASES
 BY APPLICATION & TYPE
 (million dollars)

Item	1998	2003	2008	2013	2018
National Health Expenditures (bil \$)	100.0	100.0	100.0	100.0	100.0
\$ gas/mil \$ expenditures	0.38	0.38	0.38	0.38	0.38
Health Care Mkt for Specialty Gases	0.00	0.00	0.00	0.00	0.00
By Application:					
Analytical & Laboratory	0.69	0.69	0.69	0.69	0.69
Sterilant Gases	0.72	0.72	0.72	0.72	0.72
Other	0.59	0.59	0.59	0.59	0.59
By Type:					
Atmospheric Gases	0.00	0.00	0.00	0.00	0.00
Hydrocarbon	0.06	0.06	0.06	0.06	0.06
Halogen	0.23	0.23	0.23	0.23	0.23
Noble Gases	0.63	0.63	0.63	0.63	0.63
Other	0.08	0.08	0.08	0.08	0.08
% health care	4.4	4.4	4.4	4.4	4.4
Total Specialty Gas Demand	100	100	100	100	100

SAMPLE TABLE

CHART V-1

SPECIALTY GAS MARKET SHARE, 2008
 (\$2.9 billion)



SAMPLE CHART

Sample Profile, Table & Forecast

COMPANY PROFILES

Honeywell International Incorporated

101 Columbia Road
 Morristown, NJ 07962
 973-455-2000
 http://www.honeywell.com

Sales: \$1.2 billion
 US Sales: \$1.2 billion
 Employees: 100,000

**SAMPLE
PROFILE**

Key Products: Fluorocarbon gas blends, hydrogen peroxide

Honeywell is a manufacturer that offers a variety of products, technologies and services. The Company operates in five segments: Aerospace, Automation and Control Solutions, Specialty Materials, Transportation Systems, and Corporate.

The Company is active in the US specialty gas industry through the Specialty Materials segment, which generated sales of \$5.3 billion in 2008. The segment manufactures and distributes a wide range of products, including fluorocarbon and fluorine specialty products. Among Honeywell's fluorocarbon items are OXYFUME and STERIFLO gas blends. The OXYFUME product line comprises nonflammable ethylene oxide sterilant gas blends that are used to sterilize reusable, heat sensitive medical devices. These gases are available in two types: OXYFUME 2000, which is commonly used to sterilize single-use medical devices; and OXYFUME 2002, which is typically used by hospitals to process reusable medical devices. STERIFLO gases is a nonflammable sterilizing hydrofluorocarbon gas that is engineered to replace various OXYFUME blends that will be phased out of production by 2030.

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TABLE III-2

HIGH PURITY ATMOSPHERIC GAS DEMAND BY TYPE & MARKET (million dollars)

Item	1998	2003	2008	2013	2018
Gross Domestic Product (bil \$)	90	115	140	165	190
\$ gas/mil \$ GDP	0.0001	0.0001	0.0001	0.0001	0.0001
High Purity Atmospheric Gas Demand	10	15	20	25	30
By Type:					
Nitrogen	5	7	9	11	13
Oxygen	5	8	11	14	17
By Market:					
Electronics	5	7	9	11	13
Manufacturing	3	4	5	6	7
Health Care	0	0	0	0	0
Government/Academia	2	3	4	5	6
Other	0	0	0	0	0
% atmospheric	0.0001	0.0001	0.0001	0.0001	0.0001
Total Specialty Gas Demand	10	15	20	25	30

**SAMPLE
TABLE**

"Demand for krypton is expected to increase 4.3 percent annually through 2013 to \$63 million. Like xenon, krypton finds use in the lighting and laser markets. Gains will result from a shift in the product mix from argon to krypton in various lighting technologies, particularly incandescent. Partially offsetting these advances will be increased competition for krypton-containing lasers from diode lasers, which do not contain gas."

--Section III, pg. 56

OTHER STUDIES

World Fluorochemicals

Global demand for fluorochemicals will rise 2.7% yearly by volume through 2013. The Asia/Pacific region will remain the largest market while the Africa/Mideast region grows the fastest. Inorganic and specialty fluorochemicals will continue as the top segment while fluoropolymers lead gains. This study analyzes the \$12.7 billion world fluorochemical industry, with forecasts for 2013 and 2018 by product, market, world region and for 15 countries. It also evaluates market share and profiles industry players.
 #2528 08/2009..... \$5800

Industrial Gases

Total US industrial gas demand, including some captive consumption, will grow 4.9% annually through 2013. The petroleum and natural gas industry will remain the dominant and fastest growing market, driven by the massive amounts of hydrogen needed to produce cleaner-burning fuels from increasingly impure crude oil, as required by law. This study analyzes the \$14.3 billion US industrial gas industry, with forecasts for 2013 and 2018 by market and product. It also evaluates market share and profiles industry players.
 #2460 03/2009..... \$4700

Flavors & Fragrances

US flavor and fragrance demand will grow 3.7% annually through 2012. Gains will be driven by consumer interest in costlier natural and value-added ingredients, especially in cosmetics and toiletries. Growth in the addition of active ingredients with unpleasant tastes and aromas will also support the use of flavors and fragrances to mask them. This study analyzes the \$4.4 billion US flavor and fragrance industry, with forecasts for 2012 and 2017 by market and product. It also evaluates company market share and profiles major players.
 #2461 01/2009..... \$4700

Amines

US demand for amines will grow 3% annually through 2012. Gains will be driven by new applications in personal care products, pharmaceuticals and wood preservation chemicals. Ethanolamines will remain the largest product segment by volume, and the fastest growing. Specialty amines will also offer good growth opportunities. This study analyzes the \$2.8 billion US amines industry, with forecasts for 2012 and 2017 by product and market. It also evaluates company market share and profiles industry players.
 #2446 12/2008..... \$4600

World Industrial Gases

Global industrial gas demand will rise 6.9% yearly through 2011. The developing regions of Asia/Pacific, Latin America, Eastern Europe and Africa/Mideast will continue growing at above average rates. Metals production and fabrication will remain the largest market, while the medical/health care market grows the fastest. This study analyzes the \$26.4 billion world industrial gas industry, with forecasts for 2011 and 2016 by type, market, world region and for 15 countries. It also evaluates market share and profiles major players.
 #2318 04/2008..... \$5500

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