

On top: Research spending will improve, fueling industry revenue growth

IBISWorld Industry Report OD4114 Laboratory Fume Hoods Manufacturing

September 2011

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About this Industry

Industry Definition

This industry comprises establishments that manufacture fume hoods within the United States. A fume hood is a

ventilation device that is designed to limit exposure to hazardous or noxious fumes, vapors or dusts.

Main Activities

The primary activities of this industry are

Designing fume hoods and related equipment

Manufacturing benchtop fume hoods

Manufacturing floor-mounted fume hoods

Manufacturing canopy fume hoods

Manufacturing custom fume hoods

The major products and services in this industry are

Benchtop fume hoods

Canopy fume hoods

Custom fume hoods

Floor-mounted fume hoods

Other fume hoods

Similar Industries

33341 Heating & Air Conditioning Equipment Manufacturing in the US

Companies in this industry manufacture ventilating, heating, air-conditioning, commercial and industrial refrigeration, and freezer equipment.

33911a Medical Instrument & Supply Manufacturing in the US

Companies in this industry primarily research, develop and produce medical, surgical, ophthalmic and veterinary instruments and apparatus.

54138 Laboratory Testing Services in the US

Companies in the industry perform physical, chemical and other analytical testing for commercial purposes.

Additional Resources

For additional information on this industry

www.rdmag.com

R&D Magazine

www.sefalabs.com

The Scientific Equipment and Furniture Association

www.census.gov

US Census Bureau

www.usitc.gov

US International Trade Commission

Industry at a Glance

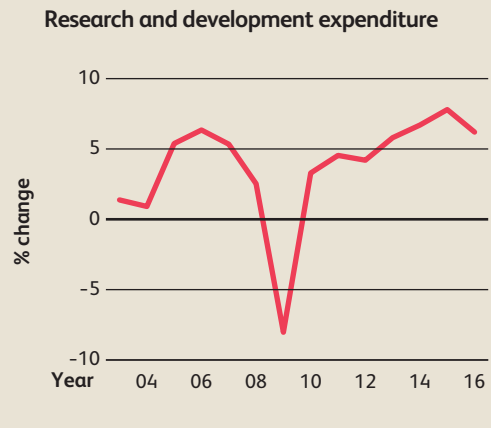
Laboratory Fume Hoods Manufacturing in 2011

Key Statistics Snapshot

Revenue **\$631.2m** Annual Growth 06-11 **-0.6%** Annual Growth 11-16 **3.5%**
 Profit **\$38.5m** Exports **\$107.8m** Businesses **57**

Market Share
 Thermo Fisher Scientific Inc. **31.8%**
 Kewaunee Scientific Corporation **9.9%**
 Labconco **6.6%**

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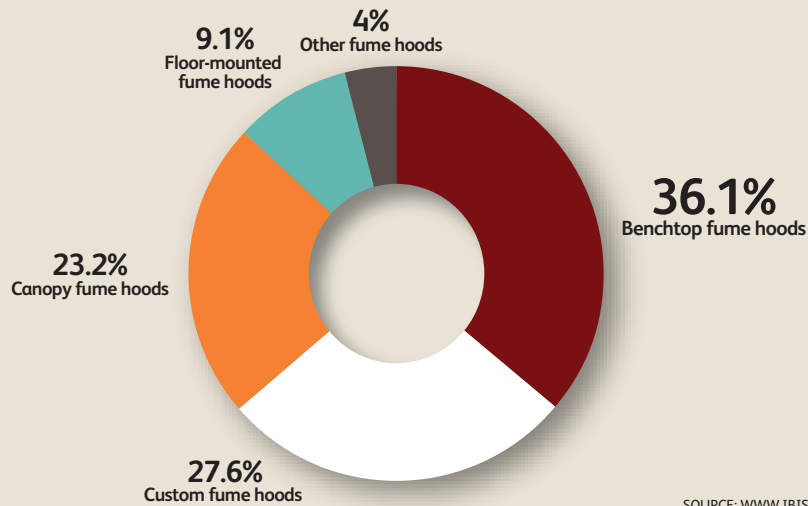


SOURCE: WWW.IBISWORLD.COM

Key External Drivers
 Research and development expenditure
 Demand from laboratory testing services
 Government funding for universities
 Total health expenditure
 Corporate profit

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Products and services segmentation (2011)



SOURCE: WWW.IBISWORLD.COM

Industry Structure

Life Cycle Stage	Mature	Regulation Level	Heavy
Revenue Volatility	Medium	Technology Change	Medium
Capital Intensity	Medium	Barriers to Entry	Medium
Industry Assistance	Low	Industry Globalization	Medium
Concentration Level	Medium	Competition Level	High

FOR ADDITIONAL STATISTICS AND TIME SERIES SEE THE APPENDIX ON PAGE 34

Industry Performance

Executive Summary | Key External Drivers | Current Performance
Industry Outlook | Life Cycle Stage

Executive Summary

The Laboratory Fume Hoods Manufacturing industry has been blown away by the gusts of the recession. This industry manufactures ventilation devices that are designed to limit exposure to hazardous or noxious fumes, vapors or dusts. As the economy started showing signs of weakness and the United States retreated into a recession, demand for industry products fell, and revenue declined. When revenue for businesses and laboratories fell, they could not justify investing in new lab

During 2010, the economy started to turn the corner and corporate profit returned, following the downturn in 2008 and 2009. Total R&D expenditure rose 3.3% in 2010 and is forecast to rise 4.5% in 2011. Despite the cutback in R&D expenditure, the industry has benefited from new product offerings. Manufacturers are increasingly offering systems that save energy through lower air volume while at the same time adhering to changing regulations and testing standards. Ductless hoods have further improved energy efficiency and cost savings by using activated carbon filters to remove toxins from the airstream.

Companies will spend on R&D again, reviving demand for laboratory equipment

equipment such as fume hoods. As a result, the industry's revenue is expected to decline at an average annual rate of 0.6% to \$631.2 million in the five years to 2011. However, revenue is forecast to turn the corner and grow 1.6% in 2011.

R&D spending is tied to total corporate revenue; as a result, it moves closely with the overall economy. As revenue tightened during the recession, businesses cut back on funding research to develop new products. R&D expenditure fell significantly in 2009, with total spending dropping by 8.0%. The decline in R&D spending resulted in lower investment in laboratory and safety equipment such as fume hoods.

Over the five years to 2016, the industry is projected to grow at a faster rate as companies invest in new products again; in turn, increasing their R&D expenses. The Laboratory Fume Hoods Manufacturing industry is forecast to grow at an average annual rate of 3.5% to \$748.1 million over the next five years. Exports are expected to grow at a rate of 5.8% to \$143.0 million during the five years to 2016. One of the primary impetuses of that growth will be an increase in demand for US laboratory fume hood products in Asia Pacific. Strong growth in research capabilities among private, government and educational institutions in China and the rest of Asia will likely drive growth in exports.

Key External Drivers

Research and development expenditure

The total amount of R&D expenditure significantly affects industry revenue. The greater the amount of expenditure, the more likely that businesses will purchase laboratory fume hoods. This driver is expected to increase during 2011, presenting a potential opportunity for the industry.

Demand from laboratory testing services

Testing laboratories demand laboratory fume hoods manufactured by this industry. When government regulations rise and more tests are required for consumer products, demand for industry products grow. This driver is expected to increase during 2011.

Industry Performance

Key External Drivers continued

Government funding for universities

As local governments cut spending on education, discretionary spending on laboratory supplies such as laboratory fume hoods by professors and school administrators will decrease. In particular, schools use industry products for research experiments. When funding is cut, schools typically delay or cancel orders for scientific supplies. This driver is expected to increase slowly during 2011.

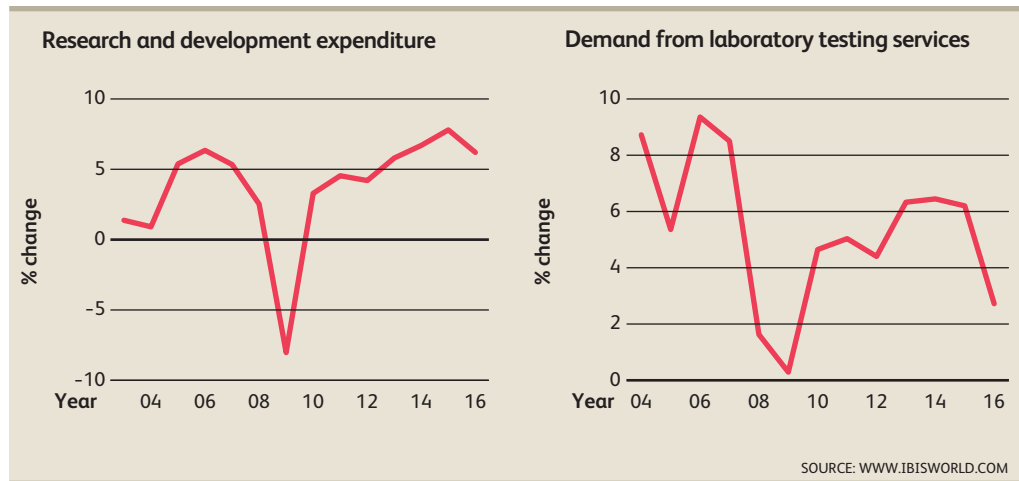
Total health expenditure

This driver consists of public and private spending on activities that aim to promote health and prevent disease, including investment in structures and equipment. This driver is a proxy that indicates demand shifts for product

testing. As private and public spending on health initiatives grows, it positively influences industry revenue, because a proportion of this spending goes toward testing to ensure that products meet health and safety standards. This driver is expected to increase in 2011.

Corporate profit

R&D is often one of the first spending cuts a company makes when its profit is squeezed, which reduces demand for laboratory fume hoods. Even though the economy and corporate profit are recovering and this driver is expected to increase during 2011, businesses will remain hesitant to spend significantly on new products and related testing. Therefore, this driver represents a potential threat to the industry.



Current Performance

The Laboratory Fume Hoods Manufacturing industry's revenue went up in smoke during the recession as laboratories scaled back their capital and research and development (R&D) expenditures. Businesses, universities and other public and private sector research institutions buy laboratory fume hoods in order to perform tests on, develop or manufacture products that

emit hazardous and noxious fumes, vapors and dusts. In 2011, the industry is expected to earn \$631.2 million, representing an average annual decline in revenue of 0.6% over the five years to 2011. Industry revenue grew 8.0% in 2007, as demand for research and lab equipment increased in response to robust consumer spending. However, as the economy started showing signs of

Industry Performance

Current Performance continued

weakness and the United States retreated into a recession, industry demand and revenue declined. With revenue for businesses and laboratories falling, they had little justification to invest in new lab equipment. Furthermore, during the recession, laboratories and other companies cut back on their R&D expenses as they shifted their focus to shoring up core business instead of

devoting resources to into future products that may never materialize. Industry revenue fell 2.5% in 2008, 3.9% in 2009 and an additional 5.4% in 2010. However, the industry is expected to turn the corner in 2011 as revenue grows 1.6% in response to a larger proportion of resources being invested in R&D and other capital expenditures.

R&D trends

R&D spending is tied to total corporate revenue; therefore, it moves closely with the overall economy. As revenue tightens during a recession, businesses tend to cut back on funding research to develop new products. R&D expenditure grew strongly from 2006 through 2007 to keep pace with the record corporate profit seen during that time. However, the financial crisis of 2008 dramatically reduced R&D expenditure. R&D fell significantly in 2009, with total spending dropping by 8.0%. The decline in R&D spending resulted in lower investment in the laboratory and safety equipment such as fume hoods. During 2010, the economy started to turn the corner and corporate profit returned after the downturn in 2008 and 2009. Total R&D expenditure rose 3.3% in 2010 and is anticipated to rise 4.5% in 2011. This increase will be led by manufacturing companies responding to recovering consumer demand.

Historically, the government has contributed significantly to R&D, but its share declined steadily over the second half of the 20th century. The government spent more on R&D than private companies in the 1950s, and represented almost a third of total R&D spending in the 1980s; however, since 2000, the split for total R&D expenditure has hovered around 90.0% private and 10.0% public. The decline in government funding has tied the total expenditure even closer to the business cycle.

With government contributions declining, laboratories have less funds to invest in fume hoods

The educational institutions market provides 29.7% of industry revenue (with the majority of funding for schools coming from the local, state and federal governments), while government facilities provide an additional 11.5% of industry revenue. In total, over a quarter of the industry's major markets depend in one way or another on government funding. The recession caused many people across the nation to lose their jobs, which dramatically shrunk tax income for all government levels. As a result, many states faced budget crises, forcing cuts. During most budget crises, government spending (particularly on education) comes under intense scrutiny and is often reduced. In 2009 and 2010, government funding for universities only grew 2.1% each year. As unemployment remains high and state governments struggle to balance their budgets, the slow growth is expected to continue into 2011. With government contributions slowing and declining, universities and government laboratories have less funds to invest in new laboratory equipment such as fume hoods.

Industry Performance

R&D trends continued

Private medical labs provide 24.0% of industry revenue, though demand for their services and products largely depends on healthcare funding and expenditure trends. Total health expenditure has increased each year during the five years to 2011, with an average annual growth rate of 4.9% during this period. Still, continued growth in 2011 of 5.0% is largely attributable to an improving economy and escalating Medicare and Medicaid spending. The improved economic environment will boost per capita disposable income, making healthcare spending more affordable for individuals. Medicare spending is expected to increase due to the rising age of the US population. In 2008 and 2009, health

expenditure growth decelerated due to the economic recession. While health expenditure growth slowed, it significantly outpaced gross domestic product (GDP). The difference in the 2009 percentage of GDP versus 2008 resulted in the largest one-year increase in the health share of GDP in history (from 17.6% in 2008 to 19.0% in 2009). The health share of GDP has increased most rapidly during periods of recession. The necessary nature of healthcare makes spending on it resilient, even while GDP growth slows during economic downturns. The sustained increase in demand for medical laboratories and medical devices has driven steady demand for fume hoods from this market segment.

Industry trends

Manufacturers increasingly offer systems that save energy through lower air volume, while adhering to changing regulations and testing standards. The average fume hood is estimated to rack up as much as \$300,000 in energy costs over the course of its lifetime. Many labs operate multiple hoods. When the number of hoods in a lab is doubled, it more than doubles the amount of air volume required. Consequently, fume hoods can represent as much as half of a lab's operating costs. More than 750,000 fume hoods are estimated to be in use in the United States today, representing thousands of megawatts consumed and an energy cost in the billions.

A decade ago, low-flow hoods revolutionized the industry by reducing air throughput and related energy costs by 40.0%. More recently, ductless hoods have further improved energy efficiency and cost savings. Ductless fume hoods use activated carbon filters to remove toxins from the airstream. Unlike

Fume hood manufacturers are addressing ergonomics and energy-efficiency issues

traditional hoods, which vent heated or conditioned workspace air, ductless fume hoods return conditioned air to the lab. This method leads to a significant drop in energy use and operating costs, while protecting the environment. A ductless fume hood requires no ductwork, arrives fully assembled, and may be installed in locations where, barring a significant and expensive renovation process, a traditional fume hood could not.

Also, fume hood manufacturers are increasingly addressing ergonomic issues, which are important since many technicians spend extended periods of time in their hoods. Hood entrances are now slanted back, rather than outward, making them easier to work in for long

Industry Performance

Industry trends continued

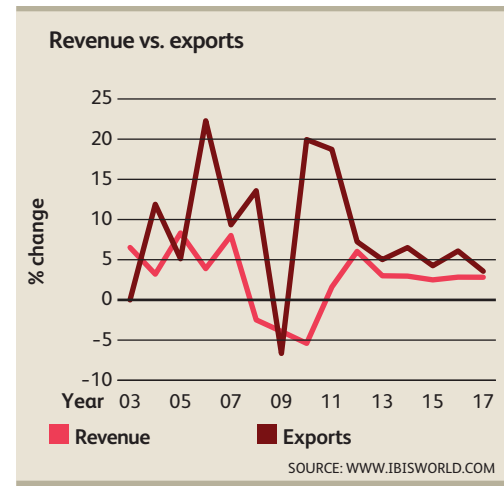
periods. Sash designs have also improved, and some units now feature horizontal sliding panels. An “intelligent

sash” closes when a motion sensor detects no movement in front of the hood for a specified time period.

International trade

Industry imports are forecast to increase at an average annual rate of 4.1% per year to \$125.9 million during the five years to 2011. In that period, China and Mexico represented strong import growth. The increasing trend of manufacturing activities being relocated to cost-competitive regions in the Asia-Pacific, such as China, has driven growth in imports in the past few years. US-based manufacturers are setting up manufacturing operations in Mexico to take advantage of trade benefits offered by the North American Free Trade Agreement. China represents the major source of imports, accounting for about 28.6% in 2011, followed by Mexico (20.9%) and Canada (11.2%). While the total import share of domestic demand has grown to 19.4% in 2011, from about 15.0% in 2006, import competition is relatively low compared with other related manufacturing industries. This factor is due to the need for products to adhere to US safety standards; the high value added nature of technologically advanced fume hood systems; and the growth in custom-made fume hoods that require heavy producer and client interaction.

Industry exports are projected to increase at an annualized rate of 10.5% to \$107.8 million over the five years to



2011. The growth has been supported by the competitiveness of high value added fume hoods produced by domestic manufacturers in the world market. Additionally, the relative weakness of the US dollar against other major currencies has supported foreign demand for US goods. China, Canada and Mexico are the most significant destinations for US exports, accounting for shares of 15.8%, 7.2% and 5.1%, respectively. Strong growth in research capabilities among private, government and educational institutions in China has driven growth in exports to that country. In 2011 alone, industry exports to China are expected to soar 90.9%.

Consolidation and profit

Industry employment is expected to fall an average of 1.6% per year from 2,858 in 2006 to 2,634 in 2011. Employment levels will fall between 2008 and 2011, with smaller operators squeezed out of the industry as they struggled to obtain clients during the recession. Many

industry employees were temporarily or permanently laid off from their jobs, while others had their work hours reduced. However, a weak dollar, which benefits domestic manufacturers, has started driving up employment in the second half of 2011.

Industry Performance

Consolidation and profit continued

Overall, total wages fell at a slower rate than employment, slipping 1.0% annually to \$106.7 million in 2011. This slower decline reflects the high skill level required to design and manufacture these technically intricate devices. The recession reduced wages in line with closures of smaller firms, but wages have since increased in the second half of 2011 as industry revenue and demand have begun to recover.

Average industry profit margin (before interest and taxes) is expected to decrease from 6.4% in 2006 to 6.1% in 2011. During the five years to 2011, profitability decreased largely because of rising raw material costs, particularly for metal parts (e.g. aluminum sheets) and plastic add-ons. Firms attempted to mitigate the effects of rising material costs by cutting production and eliminating lower-margin products.

Industry Outlook

After fighting declines, the industry has begun to recover, with revenue forecast to perk up in 2011 and 2012. IBISWorld anticipates that revenue will increase at an average annualized rate of 3.5% to \$748.1 million through 2016, with

revenue growing 6.0% to \$631.2 million in 2012. Revenue growth will primarily occur because of expanding research and development (R&D) budgets growing on the back of record high corporate profit.

R&D expenditure

IBISWorld forecasts that total R&D expenditure will rise steadily in the five years to 2016 (6.1% per year). Many of the R&D programs aided by the American Recovery and Reinvestment Act of 2009 will receive their funding starting in 2011. This factor will boost the government's share of R&D spending and help drive growth in R&D during this time. Manufacturing expenditure will continue to grow in 2011, but non-manufacturing expenditure is not expected to grow again until 2012 due to the lagged response to the economy discussed above. IBISWorld estimates R&D expenditure will not pass the 2008 total until 2012. Total R&D spending will continue to increase for the rest of the five-year period, as the economy expands and corporate profit grows, driving demand for fume hood purchases and replacements.

Government postsecondary education funding will continue to increase slowly in the five years to 2016, trickling down into more funding for university research

Annual health expenditure will accelerate, driving this market's demand for fume hoods

laboratories and fume hood purchases. Growth will be slow due to the stagnation of federal grants from the worsening deficit of the federal government. However, state and local appropriations are poised to grow again once the unemployment rate improves and governments recover lost tax revenue. The conflicting pressures will cause total funding to grow by an estimated average of 2.5% annually for the next five years, compared with the 3.4% annual average for the previous five years.

Annual health expenditure growth is forecast to continue accelerating in 2012 under current legislation, increasing by 5.1%, and eventually reaching 7.4% growth in 2016. Based on the projected

Industry Performance

R&D expenditure continued

economic recovery, private health spending growth is expected to rebound from 6.4% in 2010 to 6.9% by 2015. This growth will drive demand for fume hoods from medical device manufacturers, medical researchers and testing labs. Public spending growth is projected to accelerate significantly, in large part as the oldest baby boomers

become eligible for Medicare. While Medicaid spending growth is expected to slow because of improving economic conditions in 2011 and 2012, spending will likely accelerate in 2013 through 2015 as the relatively expensive aged and disabled eligibility groups comprise a larger share of total Medicaid enrollment.

Future opportunities

Exports are forecast to increase at a rate of 5.8% per year \$143.0 million. One of the primary motivators for that growth will be an increase in demand for US laboratory fume hood products in Asia. Strong growth in research capabilities among private, government and educational institutions in China and the rest of Asia is expected to drive export growth. For example, ThermoFisher Scientific views the Asia Pacific region as its primary growth opportunity over the next five years. Within the region, a number of countries and markets are expected to experience increases in demand for laboratory equipment such as fume hoods. These countries and markets include China, India, Japan, Australia and New Zealand, South Korea and Southeast Asia. The Asia Pacific region currently makes up 13.0% of the company's revenue (compared with 8.0% in 2006). In 2006, the company's revenue from the Asia Pacific region totaled \$0.7 billion, while in 2011, it is forecast to total \$1.3 billion, which represents a growth rate of 13.2% per year. The company targets future growth within that region of 8.0% to 10.0% per year, largely on the back of increased demand

Exports to the Asia Pacific region will take off, as countries demand more energy-efficient fume hoods

in China and India. These countries are expected to considerably increase their R&D investments. Big pharmaceutical companies have already begun outsourcing their research operations to India, and stricter environmental regulations and enforcement necessitates the need for fume hoods that meet American manufacturers' specifications. China has a five-year plan in place that emphasizes the country's scientific development to shift it from being the factory of the world to an innovation leader, as well as a shift to low emissions energy. All of these goals reinforce the need for modern energy-efficient fume hoods, causing the United States to have a comparative advantage in manufacturing. Because of this advantage and the weak US dollar, US companies are poised to experience huge strides in export growth to the Asia Pacific region.

Industry Performance

Changes in the industry's landscape

With more resources and technologies, larger firms can service clients from a wide range of industries. This aspect gives them a competitive advantage with large manufacturers that produce a variety of products. Fume hood manufacturers will likely acquire smaller manufacturers in order to increase their service offerings and profitability. IBISWorld projects that the number of enterprises will decline at a rate of 0.4% per year to 56 in 2016. As a result of consolidation, industry profit is forecast to rise over the next five years to 6.8% of industry revenue by 2016. Demand increases and more stable raw material (metal) costs will also contribute to an expanding profit margin.

IBISWorld projects that the public and private sectors will significantly increase expenditure on R&D activities. Growth in high-tech industries is expected to attract significant R&D investment aimed at developing new products and improving existing products. As product life cycles continue to shorten over the next five years, companies will seek to introduce new products to the marketplace as quickly as possible. As a result, industry employment is forecast to increase at an average annual rate of 1.4% to 2,827 by 2016, while wages are projected to rise 2.5% on average annually to \$120.5 million.

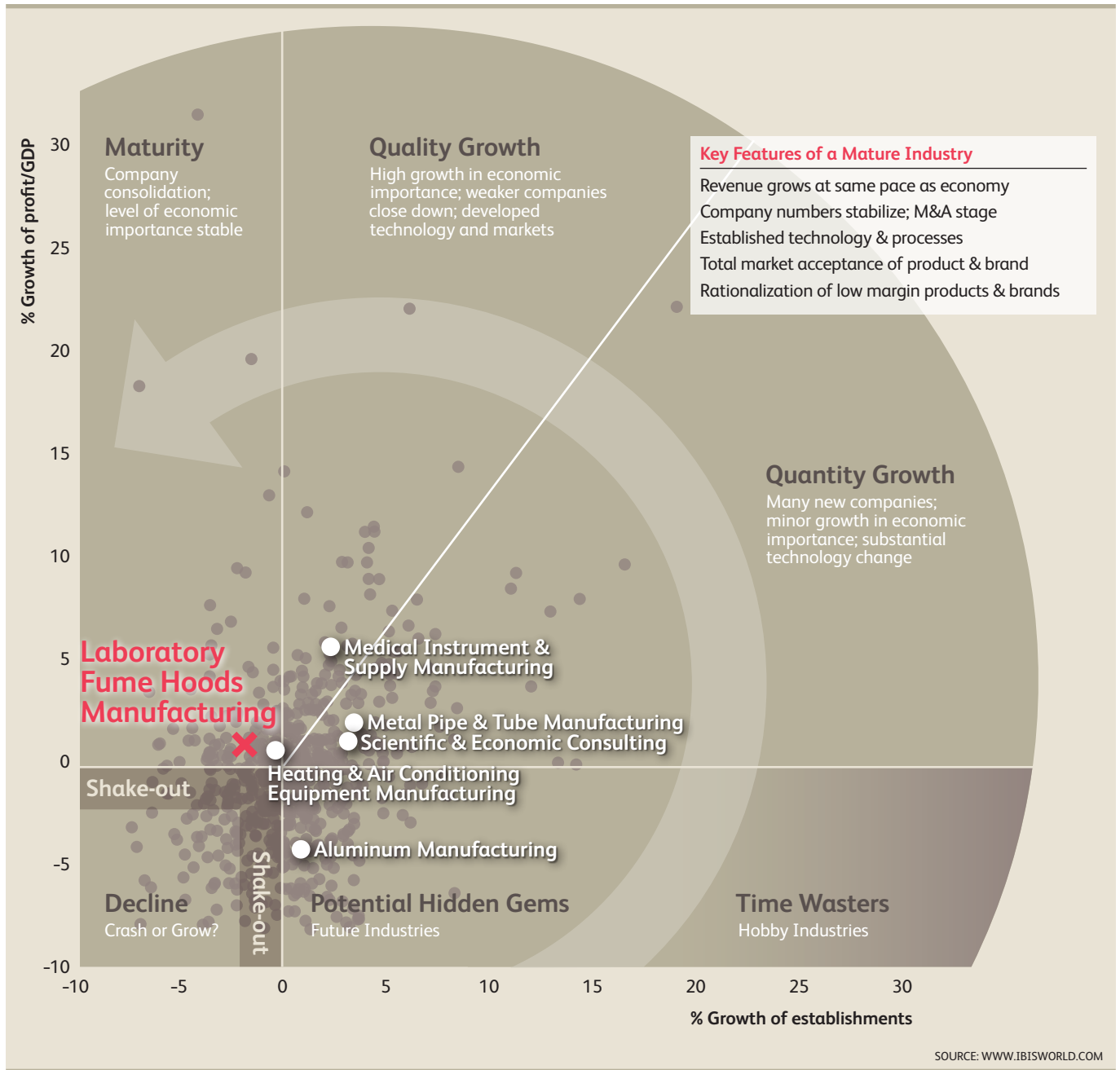
Industry Performance

Life Cycle Stage

Industry IVA is expected to mirror changes in GDP over the 10 years to 2016

New technological advancements have not dramatically affected demand

The industry has undergone consolidation during the past five years



Industry Performance

Industry Life Cycle

This industry
is **Mature**

IBISWorld estimates that the Laboratory Fume Hoods Manufacturing industry is in the mature stage of its life cycle. Over the 10 years to 2016, the industry's contribution to the economy is projected to grow at an average yearly rate of 1.4%, representing similar growth to US GDP (2.0%).

An increase in firm consolidations has occurred during the past five years, and this trend is expected to continue in the next five years. Because larger industry players make more profit, bigger firms will continue to buy smaller firms. These bigger firms are able to offer a wider range of services to a larger number of clients. The number of

enterprises is expected to decline at an average annual rate of 0.4% over the 10 years to 2016. Industry employment is also forecast to fall at a rate of 0.1% per year over the same period.

While a number of new products and innovations were introduced over the past five years, they have not had a substantive impact on industry demand. The majority of demand for industry products is for initial purchases versus replacement demand. However, as more consumers become informed about cost savings associated with newer energy-efficient fume hoods and their ergonomic benefits, product innovations will likely play a larger role in driving industry demand.

Products & Markets

Supply Chain | Products & Services | Demand Determinants
 Major Markets | International Trade | Business Locations

Supply Chain

KEY BUYING INDUSTRIES

- 31-33 **Manufacturing in the US**
 Manufacturing facilities demand fume hoods to limit exposure to hazardous or noxious fumes, vapors or dusts.

- 54138 **Laboratory Testing Services in the US**
 Firms that conduct laboratory testing services require fume hoods to limit exposure to hazardous or noxious fumes, vapors or dusts.

- 54169 **Scientific & Economic Consulting in the US**
 Scientific consultants often operate laboratories that require fume hoods.

- 54171 **Scientific Research & Development in the US**
 Research laboratories install fume hoods to limit exposure to hazardous or noxious fumes, vapors or dusts.

- 62151 **Diagnostic & Medical Laboratories in the US**
 Medical laboratories utilize fume hoods to limit exposure to hazardous or noxious fumes, vapors or dusts.

KEY SELLING INDUSTRIES

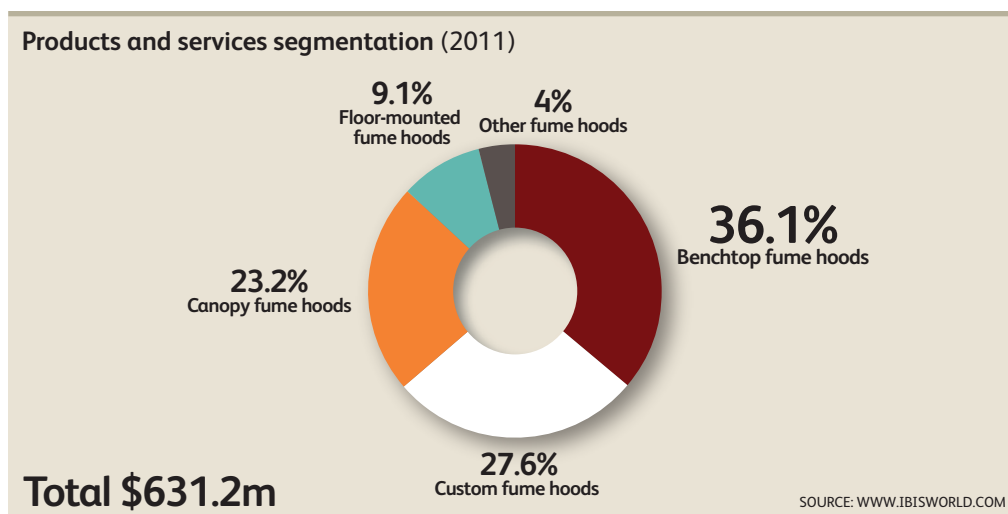
- 33121 **Metal Pipe & Tube Manufacturing in the US**
 This industry supplies steel bars, bar shapes, and plates as well as steel sheet and strip, including tin plate, to laboratory fume hood manufacturers.

- 33131 **Aluminum Manufacturing in the US**
 This industry supplies aluminum and aluminum-base alloy shapes and forms to build fume hoods.

- 33291 **Valve Manufacturing in the US**
 This industry supplies metal pipes, metal valves and pipe fittings to laboratory fume hood manufacturers.

- 33531 **Electrical Equipment Manufacturing in the US**
 This industry supplies electric motors and generators, integral horsepower electric motors and generators to laboratory fume hood manufacturers.

Products & Services



Products & Markets

Products & Services continued

The Laboratory Fume Hoods Manufacturing industry produces fume hoods for the private and public markets. These hoods are used in laboratories and facilities that require proper ventilation of workspaces to limit exposure to hazardous and noxious fumes, vapors and dusts. Fume hoods also serve as physical barriers between reactions and the laboratory, providing a measure of protection against inhalation exposure, chemical spills, run-away reactions and fires. IBISWorld estimates that more than 750,000 fume hoods are in use in the United States today, with replacement and new fume hood demand driving growth in industry revenue.

A typical fume hood has a box-like structure with a moveable sash window. Experimental procedures are performed within the hood, which is consistently and safely ventilated, usually by means of an extract blower and ductwork. When environmental concerns are important, businesses install an extract treatment system, often referred to as a scrubber, to remove most of the vapors from the exhaust air stream. Two main types of fume hoods exist: ducted and recirculating. In both, air is drawn in from the front (i.e. open) side of the workspace, and it is either expelled outside the facility or made safe through filtration and fed back into the room, with the latter being the recirculating variety. The industry excludes manufacturers of non-ventilated fume hoods and safety cabinets.

Products by segment

Fume hood demand can be divided into four product segments: benchtop, floor-mounted, canopy and custom designed. The first three are generally mass-produced for use by customers, regardless of laboratory or hazard type. Custom-designed fume hoods are

customer-specific products that require input and design specifications. Custom enclosures require particular testing and usage parameters that customers specify, though manufacturers often assist in the design concept. Overall, custom fume hoods supply an estimated 27.6% of industry revenue. This sizeable share is due to the greater cost of custom-made fume hoods and the greater service requirements in design and installation. In addition, customers typically require custom fume hoods because of size preferences, and larger fume hoods are pricier than their smaller counterparts.

Benchtop fume hoods are the most common variety of fume hood produced by the industry, representing roughly 36.1% of revenue in 2011. Benchtop fume hoods are typically priced lower than other products because of their relative simplicity and small size. They are often designed for smaller facilities or installations, in which a number of fume hoods are needed. This product's share of industry revenue has increased during the past five years as the number of small research laboratories has increased. Moreover, the economic slump reduced demand for larger, more-expensive research projects and related products.

Canopy fume hoods are another popular product that laboratories and research centers demand. After benchtop and custom-designed fume hoods, canopy fume hoods supply the third largest share of industry revenue at about 23.2%. Canopy fume hoods are either wall-mounted or suspended from the ceiling, and they are typically designed to vent non-toxic materials such as heat, steam and odors from large or bulky apparatus such as ovens, steam baths and autoclaves. Other products include floor-mounted fume hoods (9.1% of revenue), which are larger products that people can walk in and place large objects inside.

Products & Markets

Demand Determinants

Demand for fume hoods depends largely on R&D expenditure from private and public markets. As expenditure increases, the number of research facilities and laboratories grows, consequently raising the need for fume hoods. The industry's major markets include private and public research laboratories and manufacturing facilities, government agencies and educational institutions. Consequently, the industry is highly sensitive to demand from these markets and demand for research provided by its participants.

Research and development activity

Total R&D spending is tied to total corporate revenue; as a result, it moves closely with the overall economy. As revenue tightens during a recession, businesses tend to cut back on funding research to develop new products. During times of economic expansion, increased revenue is often invested back into businesses. The government historically contributed significantly to R&D, but its share declined steadily over the second half of the 20th century. The government spent more on R&D than private companies in the 1950s, and represented almost a third of total R&D spending in the 1980s; however, since 2000, the split for total R&D expenditure has hovered around 90.0% private and 10.0% public. The decline in government funding has tied total expenditure even closer to the business cycle. Total R&D expenditure has trended up since 1990, even when adjusted for inflation. The economy's growth over the same period has allowed more companies and larger companies to spend greater amounts on R&D.

R&D expenditure grew strongly from 2005 through 2007 to keep pace with the record corporate profit experienced during that time. The financial crisis of 2008 reverberated throughout the business world as the economy went into recession, and overall R&D was no exception. However, not all types of R&D felt the

downturn immediately. Manufacturing companies, which represent about two-thirds of total private investment, alter their R&D spending within a couple months of a drastic change in demand because they directly feel changes in consumer expenditures. Consequently, growth in manufacturing R&D fell sharply from 9.1% in 2007 to 1.4% in 2008. Meanwhile, non-manufacturing companies (e.g. telecommunications, finance and professional service companies) typically lag behind the business cycle by about one year because most demand for their goods and services comes from other businesses, which means they are only indirectly tied to consumer spending. As a result, growth in non-manufacturing R&D actually increased from 7.8% in 2007 to 13.9% in 2008. However, both types of R&D fell significantly in 2009, and total spending dropped 8.0% to \$212.0 billion.

Over 2010, the economy started to turn the corner and corporate profit has returned, following the downturn in 2008 and 2009. IBISWorld estimates total R&D expenditure rose 3.3% to \$218.9 billion during 2010. Manufacturing companies will respond to recovering consumer demand, leading to this increase. However, non-manufacturing R&D expenditure will continue to slide.

Technology and medical demand

The advent of new technology can boost demand for research and development, particularly when it involves a variety of new product and service possibilities. Testing is often performed on a new product to ensure that it conforms to government safety regulations (e.g. car passing regulators' crash tests) or individual company standards (e.g. making sure food that is advertised and packaged as low fat is actually low fat). Hence, the constant introduction of new technologies over a variety of industries

Products & Markets

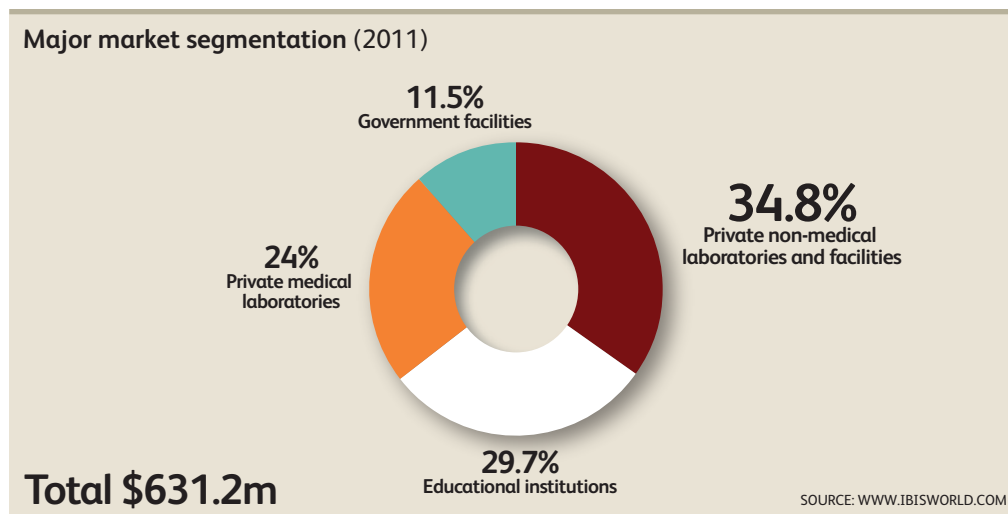
Demand Determinants continued

has led to an increase in demand for testing because new products need to be validated for safety, quality and any necessary regulatory standards before being made available for sale. In turn, increased demand for testing raises demand for accompanying equipment such as fume hoods.

In particular, technological developments in medical research have greatly boosted demand for industry

products. Private medical laboratories alone are expected to supply an estimated 42.8% of the industry's revenue in 2011. Demand for medical laboratories is mainly influenced by: scientific advancements; an aging population, which requires more and better laboratory testing and diagnostic imaging services; and the cost of medical services, which can be influenced by government program reimbursement.

Major Markets



The market for fume hoods is limited to scientific research and educational laboratories. Specifically, laboratories in which personnel and other visitors may be exposed to hazardous chemical fumes, vapors, gases, dust, mist and aerosols, in addition to chemical spills, run-away reactions and fire are the primary users of fume hoods. While fume hoods may be sold by manufacturers to laboratory equipment wholesalers or facility design and construction contractors, IBISWorld divides market segments by end-users, which are broken up into four groups: private non-medical laboratories, private medical laboratories, government facilities (excluding educational institutions) and educational institutions.

Private non-medical

laboratories and facilities

Laboratories, R&D facilities and manufacturing facilities that are operated by private organizations for purposes other than medical research provide the largest share of industry revenue at 34.8%, or \$219.7 million. This market segment includes R&D activities performed by manufacturers in-house or outsourced to laboratory testing service providers. The segment also includes facilities that are involved in energy (e.g. oil, electric and renewable), environmental and agricultural research. Overall, this segment's share of industry revenue has declined over the five years to 2011. R&D expenditure by

Products & Markets

Major Markets continued

manufacturing firms fell heavily during the recession and has been outpaced by growth in medical research.

Private medical laboratories

Private medical laboratories supply an additional 24.0% of industry revenue. This market segment primarily includes firms that are involved in healthcare and pharmaceutical research and the production of related products (e.g. medications). Medical diagnostic activities are also included within this segment, including hospitals, clinics and other firms that perform blood tests, forensic tests and bacteriological studies, among other activities. This market's share of industry revenue has grown significantly from just 16.5% in 2006. This increase has occurred, since demand for medical and healthcare services was less affected by the economic downturn. Further, demand for healthcare services continues to mount in the United States as the population ages.

Educational institutions and government facilities

Educational institutions, including universities and primary and secondary schools, comprise the second largest market for industry revenue. The

segment includes private and public institutions, regardless of funding source or partnerships. Demand from higher education typically moves in line with changes in national R&D expenditures. Demand from primary and secondary schools moves in line with changes in educational spending. As a result, demand from higher education markets tends to be more stable as primary and secondary schools are highly price sensitive and are subject to changes in state and local budgets. Nevertheless, an increased focus by schools and governments on science education has created an opportunity for growth within the segment.

Government facilities, excluding educational and medical facilities, account for the remaining 11.5% of industry revenue, or \$72.6 million. This share has decreased slightly over the past five years as budget issues have decreased expenditures by public agencies. Government spending in this field is largely for the purpose of researching and developing advancements in renewable energy sources and defense-related products. These activities often involve potentially hazardous materials that require proper facilities with fume hoods.

International Trade

Level & Trend
Exports in the industry are **Medium and Increasing**
Imports in the industry are **Medium and Increasing**

Imports

According to data from the US International Trade Commission (USITC), the industry's imports are estimated to increase by an average annual rate of 4.1% during the five years to 2011. In that period, China and Mexico represented strong import growth. The increasing trend of manufacturing activities being relocated to cost-competitive regions in the Asia-Pacific, such as China, has driven growth in imports during the past few years. US-based manufacturers are setting up

manufacturing operations in Mexico to take advantage of trade benefits offered by the North American Free Trade Agreement. Imports contracted in 2008 and 2009 as the slowing US economy resulted in lower domestic demand for the industry's products.

China represents the major source of imports, accounting for about 28.6% in 2011, followed by Mexico (20.9%) and Canada (11.2%). While the total import share of domestic demand has grown to 19.4% in 2011, from about 15.0% in 2006, import competition is relatively low

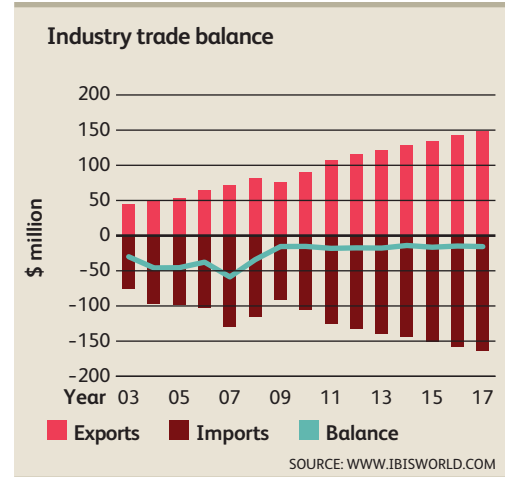
Products & Markets

International Trade continued

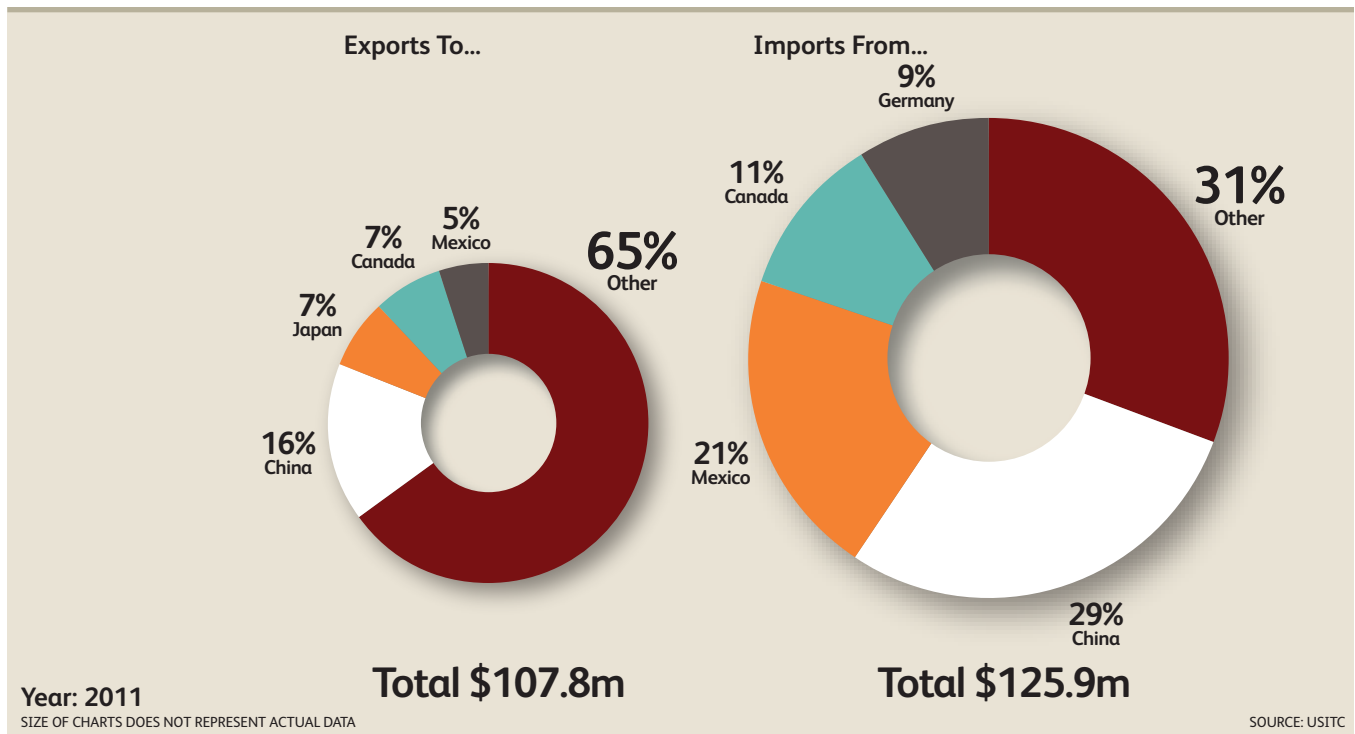
compared with other related manufacturing industries. The reasons for this relative strength are: the requirement for products to adhere to US safety standards; the high value added nature of technologically advanced fume hood systems; and the growth in custom-made fume hoods that require heavy producer and client interaction.

Exports

The total value of exports is expected to increase at an average annualized rate of 10.5% to \$107.8 million over the five years to 2011. The growth has been supported by the competitiveness of high value added fume hoods produced by domestic manufacturers in the world market. Additionally, the relative weakness of the US dollar against other major currencies has supported foreign demand for US goods. China, Canada, Japan and Mexico are the most significant destinations for US exports,

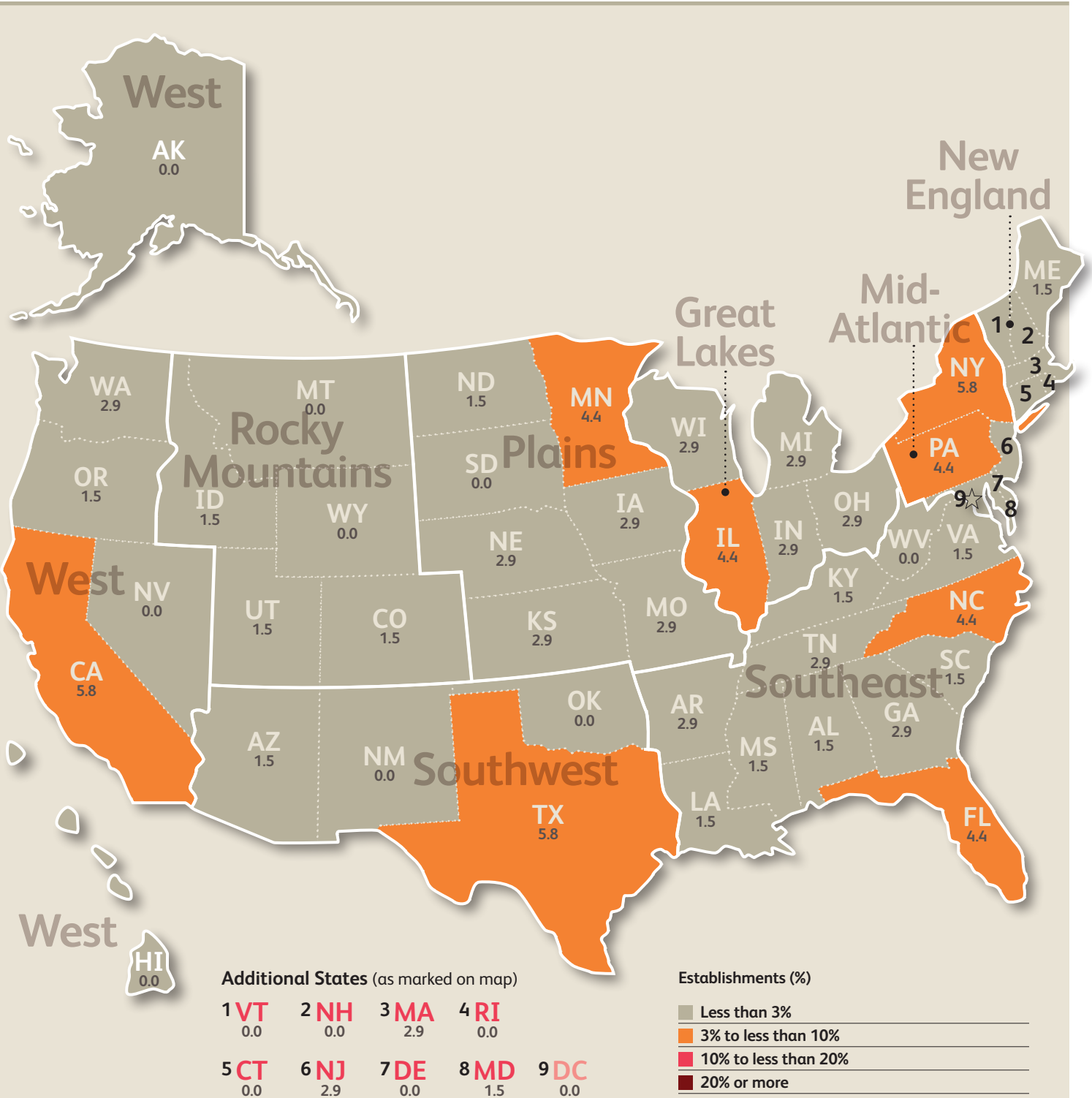


accounting for shares of 15.8%, 7.2% and 5.1%, respectively. Strong growth in research capabilities among private, government and educational institutions in China has been the major driver of growth in exports to that country. In 2011 alone, industry exports to China are expected to soar 90.9%.



Products & Markets

Business Locations 2011



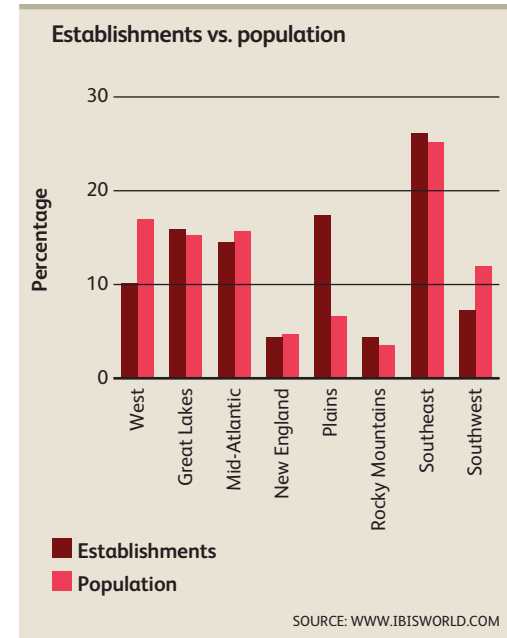
Products & Markets

Business Locations

Based on the most recent data from the US Census Country Business Patterns report, the Laboratory Fume Hoods Manufacturing industry is concentrated in the Southeast, Plains, Great Lakes and Mid-Atlantic regions of the country. Currently, the domestic industry includes only 69 manufacturing and operating establishments, operated by a total of 57 firms. The states with the greatest number of establishments are California, Texas and New York with four each, and Florida, Illinois, Minnesota, North Carolina and Pennsylvania with three establishments.

Federal and state research funding, tax laws, proximity to large private enterprises and proximity to research firms (i.e. farms for agricultural studies and oceans for oceanographic studies) affect establishment locations. The distribution also displays a mix of metropolitan areas where technological research and pharmaceutical firms are located, combined with the dominant regions for higher education where major universities are located. Firms need to locate themselves near customers, such as areas that have a strong research presence (primarily related to universities and government agencies), and near suppliers where materials can be easily accessed.

Major universities that have active research interests include Stanford,



Berkeley and the University of California in the West region. The Mid-Atlantic region includes Georgetown in the District of Columbia; Cornell and Columbia in New York; Johns Hopkins and the University of Maryland in Maryland; Princeton and Rutgers in New Jersey; and Carnegie Mellon and the University of Pennsylvania in Pennsylvania. New Jersey, Massachusetts and Pennsylvania are also home to a number of large pharmaceutical and chemical manufacturing companies.

Competitive Landscape

Market Share Concentration | Key Success Factors | Cost Structure Benchmarks
Basis of Competition | Barriers to Entry | Industry Globalization

Market Share Concentration

Level
Concentration in this industry is **Medium**

The level of market share concentration within the Laboratory Fume Hoods Manufacturing industry is medium, as the four largest firms account for 40.0% to 70.0% of revenue. Market share concentration among the top four players has increased as major companies pursue mergers and acquisitions in order to acquire new technology patents and

reach new target markets. Additionally, the recession reduced some firms' ability to compete in the marketplace, with the ongoing economic slump expected to continue this trend through 2011. Overall, the total number of firms operating in the domestic industry is projected to decrease at an average annualized rate of 0.3% to 57.

Key Success Factors

IBISWorld identifies 250 Key Success Factors for a business. The most important for this industry are:

Having a diverse range of clients

A company's client and geographic diversity can mitigate the effects of fluctuations in market demand.

Availability of supplies

A disruption in material supplies can have an adverse effect on a company's ability to meet its commitments.

Ability to vary services to suit different needs

Because of the diverse range of fume hood systems available to customers, firms within this industry must have the flexibility to manufacture a

range of models and sizes to suit customer requirements.

Ability to accommodate environmental requirements

In light of environmental concerns over energy usage of fume hoods, many firms within this industry group compete on their ability to accommodate environmentally friendly goods and services.

Must comply with required product standards

Companies in this industry develop products that are used by laboratories to comply with safety regulations.

Cost Structure Benchmarks

Average industry profit margin (earnings before interest and taxes) is expected to decrease from 6.4% in 2006 to 6.1% in 2011. During the five years to 2011, profitability decreased largely because of rising raw material costs, particularly for metal parts (e.g. aluminum sheets) and plastic add-ons. Firms attempted to mitigate the effects of rising material costs by cutting production and eliminating lower-margin products. According to the Bureau of Labor Statistics (BLS), the price of nonferrous metals has grown at an average annual rate of 4.1%; however, this figure hides major fluctuations that occurred over the period, including a 19.1% drop in 2009,

21.3% jump in 2010 and an expected 12.0% increase over the current 2011 year. This rapid price increase in nonferrous metals, a key industry input, has limited industry margin improvements since the recession.

Purchases

IBISWorld expects that the cost of materials will account for about 62.0% of industry revenue in 2011. As a percentage of revenue, total material costs have fluctuated between 48.0% and 65.0% during the past decade. There is a near-perfect correlation between revenue and the amount spent on materials. The industry purchases a broad range of

Competitive Landscape

Cost Structure Benchmarks continued

materials and components throughout the world, including steel, copper tubing, aluminum, ferrous and nonferrous castings, clays, motors and electronics. Operators rely on the ability of suppliers to meet delivery schedules and performance and quality specifications. Other purchases include: compressors, electric motors, castings, forgings, stampings, electronic starters and controls, aluminum fins, fan blades, capacitors, transformers, refrigerant gases, valves and fittings.

As a result of commodity cost increases between 2004 and 2006 and since 2010, many manufacturers have increased the prices for many of their products. Raw material costs fluctuate for a number of reasons, such as prevailing market conditions, the quality of raw materials, the quantity of raw materials and the number of suppliers. Firms' raw material costs can increase or decrease depending on the volumes of raw materials purchased from suppliers, and the quality or composition of raw materials used to manufacture fume hoods.

Costs in this industry vary in relation to the type of products manufactured and the configuration of particular products. Larger and more specialized products may require higher technical

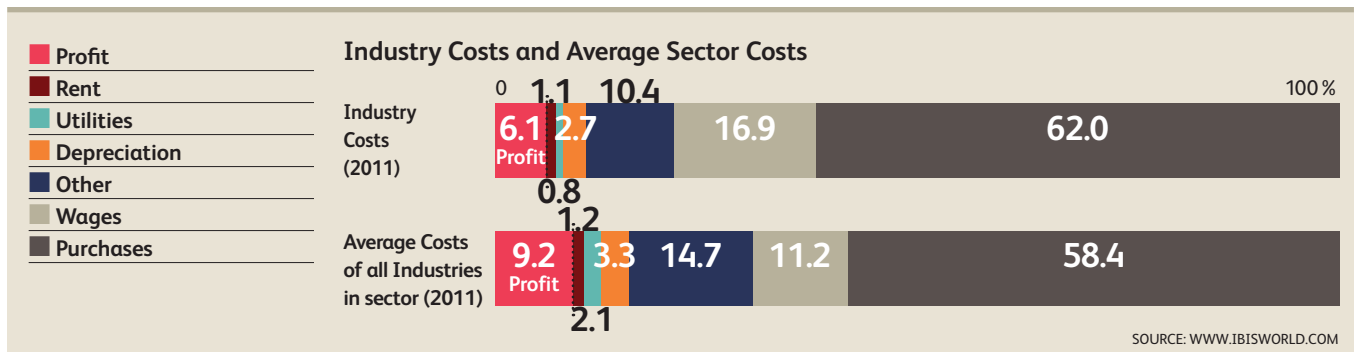
development, and relatively higher input costs in comparison with standard type products. Changes in selling prices correspond with changes in the cost of acquiring raw materials.

Wages

Wages are expected to account for 16.9% of revenue in 2011. The average wage and salary cost per worker will be about \$40,500 in 2011 compared with \$39,300 in 2006. Some factors of production, such as managerial expertise and skilled labor, are relatively expensive in this industry. Nevertheless, because of the possibility of increased efficiency with such inputs, they can lead to a decrease in the average cost of production and selling. Most employees in this industry are production workers.

Other costs

IBISWorld estimates that depreciation, which includes depreciating assets such as buildings, machinery, equipment and computers, has accounted for about 2.7% of industry revenue since 2006. All other expenses include selling, advertising, legal, accounting and administrative expenses; fuel and electricity; contract work; leases on buildings and machinery; and communications.



Competitive Landscape

Basis of Competition

Level & Trend
 Competition in this industry is **High** and the trend is **Increasing**

The Laboratory Fume Hoods Manufacturing industry has a high level of competition. Currently, 57 domestic companies compete in the industry. However, domestic manufacturers also face competition from imported industry products, which play a medium and growing role in the US market.

The industry’s major competitive factors include price, quality, service, location, product diversity, technological innovation and patents. Price is one of the most important factors; the majority of industry products are relatively expensive, but prices may vary depending on customer needs. Benchtop fume hoods tend to be the least expensive industry product segment, while more expensive walk-in and custom fume hoods can be major expenditures for laboratories. Producers that have economies of scale and sufficient purchasing power can negotiate to buy metal and plastic resin inputs at lower costs, enabling them to produce lower-cost products and giving them a competitive advantage.

In addition to price, the product’s quality is a significant factor for

companies. Since the industry provides a safety product to employees in manufacturing, healthcare, research and service industries, the product’s ability to absorb fumes and properly ventilate workspaces is integral for generating repeat sales and providing an image of exceptional product quality. Product diversity is another important competitive factor. Industry operators must have the ability to offer a range of fume hoods to a variety of downstream industries.

Timeliness and speed of delivery and after-sales service are integral for generating repeat sales. The location of a manufacturing facility and its proximity to key customers is also important in regard to meeting delivery deadlines and reducing transportation costs.

There is a moderate level of technological innovation in the industry. Companies that develop new products with better ventilation capacity, enhanced safety features, or those that utilize new materials can more effectively compete in the industry. The ability to patent technological innovations gives industry operators incentive to invest in research and development.

Barriers to Entry

Level & Trend
 Barriers to Entry in this industry are **Medium** and **Steady**

The industry has moderate barriers to entry, given the capital requirements required for starting a new business. Furthermore, several regulations govern the proper operation of fume hoods, which manufacturers must adhere to. The industry faces a moderate level of competition; while there are only 57 domestic firms, the level of import competition is also growing.

Start-up costs vary depending on the scale of operations and the manufacturing location. In general, high capital costs are required to manufacture laboratory fume hoods. Skilled labor is another important

Barriers to Entry checklist

	Level
Competition	High
Concentration	Medium
Life Cycle Stage	Mature
Capital Intensity	Medium
Technology Change	Medium
Regulation & Policy	Heavy
Industry Assistance	Low

SOURCE: WWW.IBISWORLD.COM

requirement for entering the industry. Typical employees include engineers, designers, management and floor staff. The level of difficulty in securing staff

Competitive Landscape

Barriers to Entry continued

depends on labor market conditions; the difficulty increases when the market is tight. Conversely, when many

people lose their jobs because of a downturn or a recession, it is easier to find qualified staff.

Industry Globalization

Level & Trend
Globalization in this industry is **Medium** and the trend is **Increasing**

The level of globalization within the Laboratory Fume Hoods Manufacturing industry is medium and increasing. Imports currently make up about 19.4% of domestic demand, while exports account for 17.1% of total industry revenue. China is the industry's major import source, and many imported products are produced

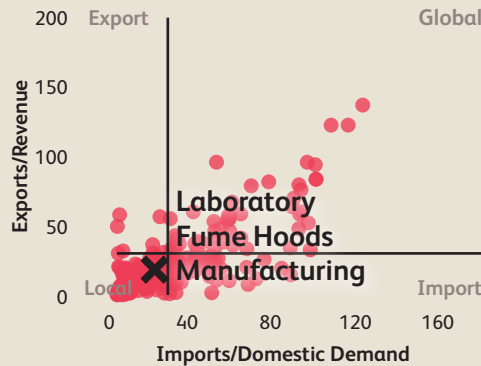
under license from US companies. Furthermore, some of the industry's largest firms operate facilities abroad, and the level of offshoring activity is increasing. For example, major player Thermo Fisher Scientific recently closed one of its New York manufacturing establishments and set up a new facility in Mexico.

International trade is a major determinant of an industry's level of globalization.

Exports offer growth opportunities for firms. However there are legal, economic and political risks associated with dealing in foreign countries.

Import competition can bring a greater risk for companies as foreign producers satisfy domestic demand that local firms would otherwise supply.

Trade Globalization



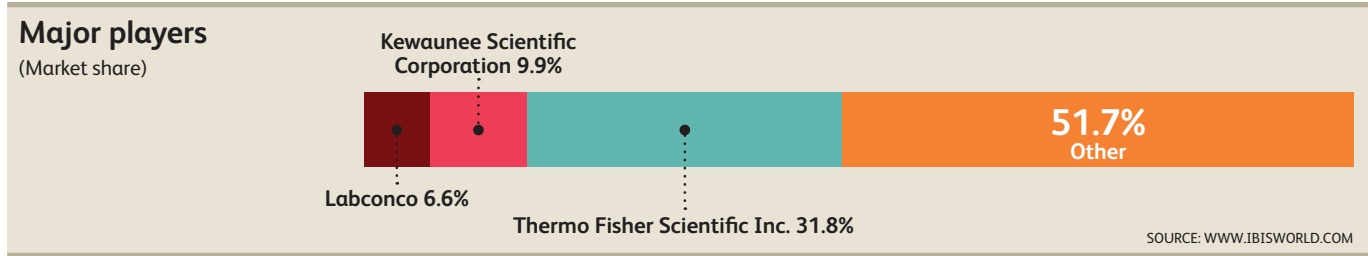
Going Global: Laboratory Fume Hoods Manufacturing 2000-2011



SOURCE: WWW.IBISWORLD.COM

Major Companies

Thermo Fisher Scientific Inc. | Kewaunee Scientific Corporation
 Labconco | Other Companies



Player Performance

Thermo Fisher Scientific Inc.
 Market share: 31.8 %
Industry Brand Names
 Hamilton Fisher LLC
 ALC Collegedale

Thermo Fisher Scientific Inc. is a worldwide leader in analytical and scientific products and services. The company’s primary clients include pharmaceutical and biotech companies, hospitals and clinical diagnostic labs, universities and research institutions, and government agencies. Thermo Fisher is the result of a 2006 merger between Thermo Electron Corporation and Fisher Scientific International Inc. It continues to separate these brands. Thermo Scientific represents the technology side of the company, and Fisher Scientific offers a portfolio of equipment and supplies such as consumables, analytical instruments and specialty diagnostic and bioscience products.

The company is divided into two operating segments: analytical technologies and laboratory products and services. About 33.0% of Thermo

Fisher’s revenue is from the manufacture and sale of instruments, equipment and software. Meanwhile, US sales are expected to generate about 59.9% of total company revenue in 2011.

Thermo Scientific offers more than 1,000 fume hood types and accessories under its subsidiary brands Hamilton and ALC Collegedale. Thermo Scientific manufactures fume hoods, casework and other laboratory furniture at six manufacturing facilities throughout the United States, Mexico and China. The company’s US facilities are located in Two Rivers, WI (two facilities); Mountain Home, AR; and Round Rock, TX. In 2010, the company ceased manufacturing at an ALC Collegedale plant in Ooltewah, TN. The company cited heightening price competition from a general overcapacity in the laboratory furniture

Thermo Fisher Scientific Inc. (US laboratory fume hood manufacturing segment) – financial performance*

Year	Revenue (\$ million)	(% change)	Net Income (\$ million)	(% change)
2006	41.9	N/C	2.9	N/C
2007	169.3	304.1	11.8	306.9
2008	184.7	9.1	13.3	12.7
2009	183.9	-0.4	12.7	-4.5
2010	191.5	4.1	13.6	7.1
2011	200.5	4.7	19.8	45.6

*Estimates

SOURCE: ANNUAL REPORT AND IBISWORLD

Major Companies

Player Performance continued

market and began consolidating its Tennessee operations with the Round Rock, TX plant in early 2010.

Financial performance

Over the five years to 2011, the company has made multiple acquisitions of other manufacturers and distributors in the scientific field. Altogether, the company has acquired 35 companies since 2006, while it has made only four divestures over the same period. As a result of these acquisitions and growth in key downstream markets, the company's

total revenue is estimated to expand at an average annualized rate of 24.7% over the five years to 2011 to reach \$11.4 billion. This figure includes 6.1% growth expected in 2011. Within the US Laboratory Fume Hoods Manufacturing industry, IBISWorld anticipates the company will record \$200.5 million over 2011, which is about 31.8% of total industry revenue. During the year, Thermo Fisher's profit performance is expected to be bolstered by improving economic conditions and newly consolidated manufacturing facilities.

Thermo Fisher Scientific Inc. – financial performance

Year	Revenue (\$ million)	(% change)	Net Income (\$ million)	(% change)
2006	3,791	N/A	166.7	N/A
2007	9,746	157.1	748.4	349.0
2008	10,498	7.7	980.9	31.1
2009	10,109	-3.7	850.3	-13.3
2010	10,788	6.7	1,035.6	21.8
2011*	11,446	6.1	1,503.7	45.2

*Estimate

SOURCE: ANNUAL REPORT AND IBISWORLD

Player Performance

Kewaunee Scientific Corporation
Market share: 9.9%

Kewaunee Scientific Corporation is a Statesville, NC-based manufacturer of laboratory, technical and laminate furniture products. The company divides its operations into two reportable business segments: domestic operations (accounting for 84.1% of total sales in fiscal 2011), and international operations (15.9% of Kewaunee's sales in fiscal 2011). As of April 30, 2011, Kewaunee had about 598 full-time employees, including approximately 475 employees in the United States.

Kewaunee operates four manufacturing plants, three of which are located in Statesville, NC. Together with corporate administrative, marketing,

research and development and warehouse space, the company's North Carolina facilities comprise about 413,000 square feet and are located on more than 20 acres of land. The company also has a manufacturing facility in Bangalore, India, which serves the expanding Asian markets.

Kewaunee is strongly committed to researching and developing new products, resulting in a reputation for solid quality and innovation. In fiscal 2011, Kewaunee spent \$1.2 million on R&D activities related to new or redesigned products. Over 2010, the company completed the design of a new product line of laminar fume hoods,

Major Companies

Player Performance continued

Kewaunee Scientific Corporation (US laboratory fume hood manufacturing segment) – financial performance**

Year*	Revenue (\$ million)	(% change)	Net Income (\$ million)	(% change)
2006-07	49.6	N/A	1.7	N/A
2007-08	54.7	10.3	3.4	100.0
2008-09	61.7	12.8	4.1	20.6
2009-10	59.2	-4.1	3.5	-14.6
2010-11	57.3	-3.2	1.9	-45.7
2011-12	62.2	8.6	0.4	-78.9

*Year end April; **Estimates

SOURCE: ANNUAL REPORT AND IBISWORLD

several ductless fume hood products and its Class B fume hood for its biological safety product line. The introduction of these products is expected to boost sales within the industry over the remainder of fiscal 2011 to 2012. The company has focused on expanding its presence to growing Asian markets, developing and marketing more energy-efficient products and implementing strategies to reduce manufacturing costs and improve efficiencies.

Financial performance

Over the five years to 2011, total company revenue is expected to grow at a rate of 5.4% to \$105.9 million. In fiscal

2011, Kewaunee generated net sales of \$100.0 million, just a 0.9% increase from 2010. In the five years through fiscal 2011, Kewaunee's revenue within the US Laboratory Fume Hoods Manufacturing industry is expected to grow at an average annualized rate of 4.6% to \$62.2 million. After dipping over fiscal 2010 and 2011, domestic sales volumes are anticipated to increase significantly in the year ending April 2012. A broader recovery in the downstream markets and a new dealer relationship with leading laboratory furniture dealer and service provider ISEC will likely drive this growth. Despite a strong uptick anticipated in

Kewaunee Scientific Corporation – financial performance

Year*	Revenue (\$ million)	(% change)	Net Income (\$ million)	(% change)
2006-07	81.4	N/A	1.8	N/A
2007-08	89.5	10.0	3.6	100.0
2008-09	104.0	16.2	4.5	25.0
2009-10	99.1	-4.7	3.8	-15.6
2010-11	100.0	0.9	2.1	-44.7
2011-12**	105.9	5.9	0.7	-66.7

*Year end April; **Estimate

SOURCE: ANNUAL REPORT AND IBISWORLD

Major Companies

Player Performance continued

sales volume over the current year, the company's profit margins are expected to continue contracting because of lower

average selling prices and higher costs paid for raw materials, particularly steel and epoxy resin.

Player Performance

Labconco

Market share: 6.6 %

Labconco, originally named Laboratory Construction Company, was established in 1925 to develop scientific equipment. Since then, the company has grown from a garage operation to an internationally known laboratory supply and equipment manufacturer. In addition to fume hoods, the company manufactures forensic enclosures, freeze dry systems, glove boxes, lab animal enclosures, vacuum desiccators, glassware washers, and base cabinets and accessories. The company manufactures all 16 of its product lines at two US manufacturing facilities; one is in Kansas City, MO (also home to the company's corporate headquarters) and the other is in Fort Scott, KS.

Labconco distributes its products worldwide through a network of laboratory supply wholesalers and

distributors. The company has been awarded the President's "E" award for excellence in exporting from the United States. The company is also a member of the US Green Building Council (USGBC) a nonprofit organization committed to expanding sustainable building practices. Three of Labconco's product lines currently contribute to LEED credits (USGBC's sustainable building rating system): fume hoods, biosafety cabinets and glassware washers.

Labconco is a privately held corporation and does not publically disclose its financial results. Nevertheless, during the five years to 2011, IBISWorld estimates the company's revenue within the US Laboratory Fume Hoods Manufacturing industry will grow at an average annual rate of 0.8% to \$41.7 million.

Labconco Corporation (US laboratory fume hood manufacturing segment) – financial performance*

Year	Revenue (\$ million)	(% change)	Net Income (\$ million)	(% change)
2006	40.0	N/A	2.7	N/A
2007	43.9	9.7	3.0	11.1
2008	44.3	0.9	2.9	-3.3
2009	41.6	-6.1	2.7	-6.9
2010	39.8	-4.3	2.5	-7.4
2011	41.7	4.8	2.6	4.0

*Estimates

SOURCE: IBISWORLD

Major Companies

Other Companies

This industry is characterized by a large number of small to medium sized companies, and as such does not have many major players. Participants are generally private companies that operate single manufacturing plants and do not release any financial or performance information. The following text highlights a few examples of the types of companies that are prevalent throughout the Laboratory Fume Hoods Manufacturing industry. Some other notable companies include Sheldon Laboratory Systems, AirClean Systems and NuAire.

The Baker Company

Estimated market share: 3.6 %

The Baker Company has developed, tested and manufactured laboratory contamination control equipment for more than 60 years. The company serves four main markets: biotech, pharmaceuticals, government, clinical and medical education. Baker's corporate headquarters is located in Sanford, ME, along with its 120,000 square foot testing and manufacturing facility. IBISWorld expects the company to maintain a 3.6% share of the US Laboratory Fume Hood Manufacturing industry's total revenue over 2011, accounting for about \$24.1 million.

AirScience

Estimated market share: Less than 2.0 %

AirScience manufactures a range of high-efficiency air filtration systems for the biotech, clinical, hospital, dental, educational, forensic, pharmaceutical and government markets. All of AirScience's products use proprietary filtration technology developed in house. The company's 45,000 square foot facility is located in Fort Meyers, FL, and this location also serves as its corporate headquarters and manufacturing facility. AirScience generates about \$15.0 million annually.

Air Master Systems

Estimated market share: Less than 2.0 %

Air Master Systems has been manufacturing fume hoods since 1975. The company manufactures all of its products at its Muskegon, MI, plant with a strong emphasis on quality and customer support. The company employs a total of 30 full-time employees at its headquarters and sales offices in California and Wisconsin. Air Master offers more than 20 different fume hood products and accessories, including eco-friendly solutions. IBISWorld estimates Air Master will record about \$15.0 million in revenue over 2011.

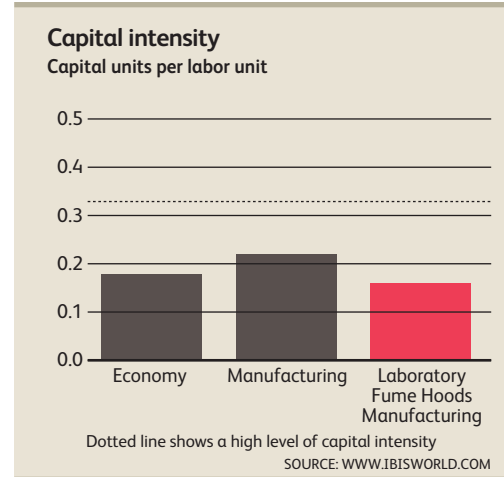
Operating Conditions

Capital Intensity | Technology & Systems | Revenue Volatility
 Regulation & Policy | Industry Assistance

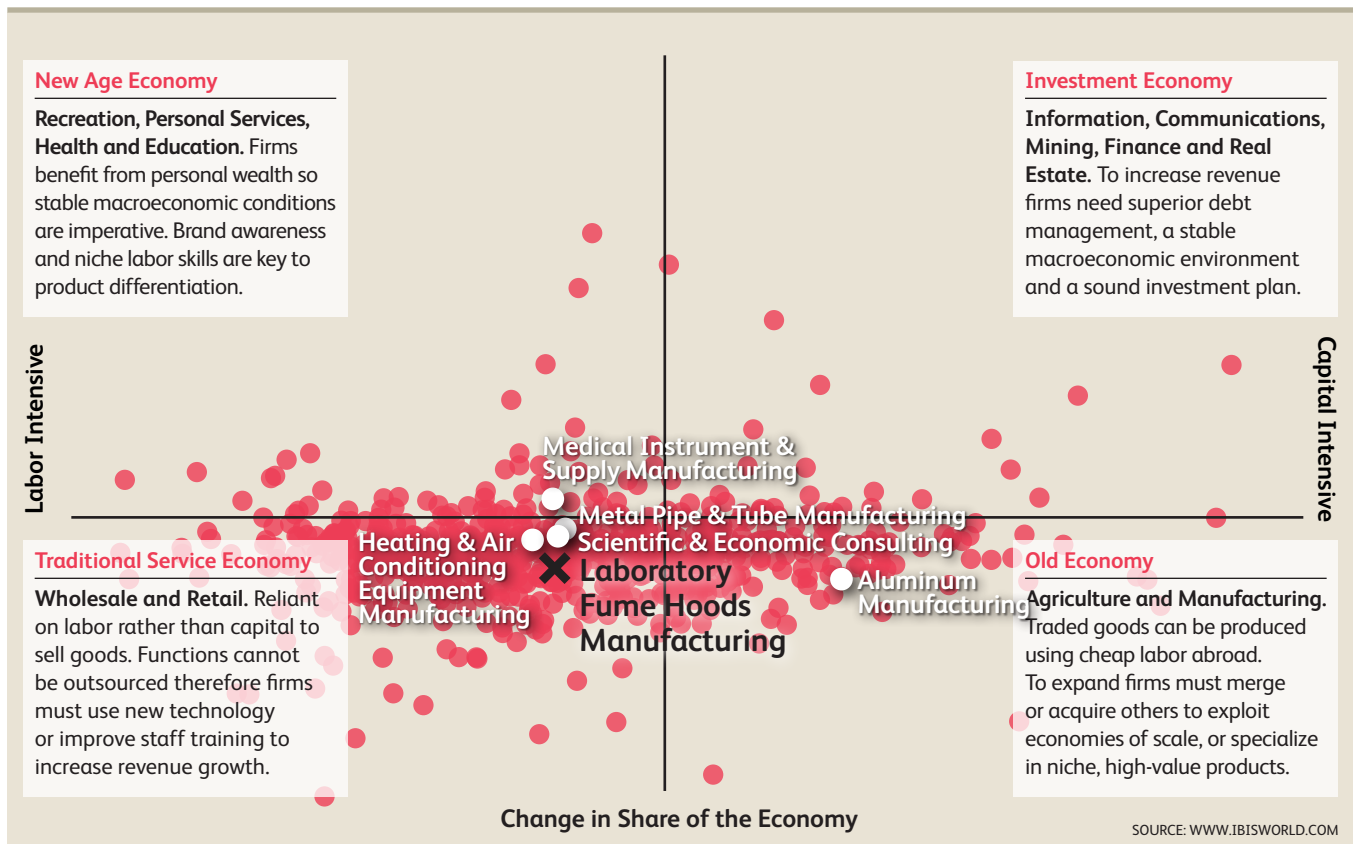
Capital Intensity

Level
 The level of capital intensity is **Medium**

The Laboratory Fume Hoods Manufacturing industry is characterized by a medium level of capital intensity. IBISWorld estimates that the average firm allocates roughly \$16 in capital expenditures for every \$100 spent on labor in 2011. While total capital expenditures are expected to amount to \$17.0 million in 2011, this total has decreased slightly over the past five years, due to a drop during the economic slump over recent years. However, several industry participants have noted greater capital expenditure for information technology systems and the replacement of manufacturing equipment and machinery.



Tools of the Trade: Growth Strategies for Success



Medical Instrument & Supply Manufacturing
 Metal Pipe & Tube Manufacturing
 Scientific & Economic Consulting
Laboratory Fume Hoods Manufacturing
 Heating & Air Conditioning Equipment Manufacturing
 Aluminum Manufacturing

Operating Conditions

Technology & Systems

Level
The level of
Technology Change
is **Medium**

Technology in the Laboratory Fume Hoods Manufacturing industry is primarily focused on maintaining a competitive cost structure by controlling manufacturing and operating expenses, and investing in global standardization, IT infrastructure and product development. Costs are kept relatively high as manufacturers' activities and technologies are often redesigned in response to changes in inputs and outputs. Firms undertake investment to reconfigure consumer products to become more innovative and comply with changing customer needs. Production facilities must accommodate rapid changes in production schedules and produce profitable batch runs of varying sizes. Therefore, the equipment used by industry firms is important to meet the needs of customers. While the types and extent of technology within this industry vary across product segments, some common technological issues exist. For instance, there are intensive manufacturing operations that use computer numerically controlled machinery to manufacture products. Nearly all businesses and the products they manufacture make use of the latest controls technology to enhance all areas

of product performance. Some of the larger firms develop "next generation" controls to meet global and regional market demands.

An important part of firms' growth strategies is to invest in research and new product development. Many companies have R&D centers that are focused on combustion technology, air movement and indoor air quality, heat transfer and power generation. Manufacturers often have to build relationships with a range of service providers and end users, such as project construction contractors, architects, construction engineers and maintenance service providers.

Due to changing environmental regulations, R&D expenditure is also related to alternative ventilators with less impact on the environment, airflow technology, acoustics and micro-electronic controls. Firms use commercially available computer-aided design, computer-aided manufacturing and computational fluid dynamics to streamline the design and manufacturing processes. They also use these technologies to run computer simulations on a product design before a working prototype is created.

Revenue Volatility

Level
The level of
Volatility is **Medium**

The industry is characterized by moderate revenue volatility. Industry market demand from manufacturing customers can be highly volatile and cyclical. Additionally, the introduction of laboratory or workplace equipment standards and regulations requires customers to purchase new equipment for their employees over a short period of time in order to comply. However, volatility is lessened by

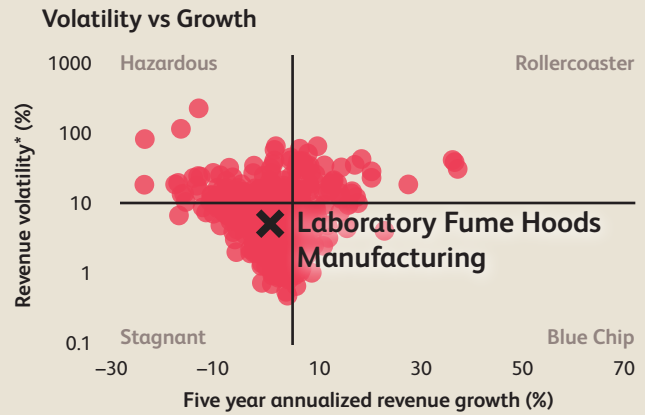
more stable demand markets such as healthcare facilities and research laboratories. Moreover, fixed workplace and educational regulations mean that demand for industry product cannot fall drastically because employers and educational institutions cannot risk noncompliance by withholding the purchase of proper fume hoods to save costs.

Operating Conditions

Revenue Volatility continued

A higher level of revenue volatility implies greater industry risk. Volatility can negatively affect long-term strategic decisions, such as the time frame for capital investment.

When a firm makes poor investment decisions it may face underutilized capacity if demand suddenly falls, or capacity constraints if it rises quickly.



* Axis is in logarithmic scale

SOURCE: WWW.IBISWORLD.COM

Regulation & Policy

Level & Trend
The level of Regulation is **Heavy** and the trend is **Steady**

Federal, state, local and international laws and regulations concerning the environment include the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation and Liability Act, the Occupational Safety and Health Act, the National Environmental Policy Act and the Toxic Substances Control Act. The industry is also influenced by any regulations that are promulgated under these acts and various other federal, state and local laws and regulations governing environmental matters.

Companies within this industry segment are subject to appliance efficiency regulations promulgated under the National Appliance Energy Conservation Act of 1987 and various state regulations concerning the energy efficiency of its products. As a result, firms have developed, and are developing, products that comply with the recently revised National Appliance Energy Conservation Act. Stricter standards in the future will require additional R&D investment and capital expenditures to maintain compliance and continue to give choices to customers.

Industry Assistance

Level & Trend
The level of Industry Assistance is **Low** and the trend is **Steady**

The industry receives little to no federal industry assistance. However, regulations regarding workplace safety set by the Occupational Safety & Health

Administration (OSHA) tend to support demand for fume hoods as employer markets and other facilities must comply with regulations.

Key Statistics

Industry Data

	Revenue (\$m)	Industry Value Added (\$m)	Establishments	Enterprises	Employment	Exports (\$m)	Imports (\$m)	Wages (\$m)	Domestic Demand (\$m)	R&D Expenditure (\$b)
2002	524.5	127.3	69	60	2,611	45.4	61.6	99.4	540.7	186.1
2003	558.7	135.6	71	62	2,976	45.4	75.4	113.1	588.7	188.6
2004	576.6	138.3	71	61	2,951	50.8	96.7	115.8	622.5	190.4
2005	624.6	139.7	70	60	2,770	53.4	99.0	112.7	670.2	200.6
2006	648.9	146.4	67	58	2,858	65.3	103.0	112.4	686.6	213.3
2007	700.9	156.9	68	59	2,868	71.4	130.1	116.4	759.6	224.7
2008	683.5	154.8	72	61	2,952	81.1	115.3	116.4	717.7	230.4
2009	656.7	141.8	71	60	2,691	75.7	91.2	112.8	672.2	211.9
2010	621.2	134.4	70	59	2,674	90.8	106.1	110.2	636.5	218.9
2011	631.2	137.1	69	57	2,634	107.8	125.9	106.7	649.3	228.8
2012	669.3	150.0	69	56	2,664	115.6	133.0	109.1	686.7	238.4
2013	689.4	151.7	68	56	2,685	121.4	139.1	111.1	707.1	252.3
2014	709.8	156.7	70	57	2,782	129.3	143.3	116.2	723.8	269.2
2015	727.5	159.3	70	56	2,814	134.8	151.3	118.8	744.0	290.2
2016	748.1	161.0	70	56	2,827	143.0	157.8	120.5	762.9	308.1

Annual Change

	Revenue (%)	Industry Value Added (%)	Establishments (%)	Enterprises (%)	Employment (%)	Exports (%)	Imports (%)	Wages (%)	Domestic Demand (%)	R&D Expenditure (%)
2003	6.5	6.5	2.9	3.3	14.0	0.0	22.4	13.8	8.9	1.3
2004	3.2	2.0	0.0	-1.6	-0.8	11.9	28.2	2.4	5.7	1.0
2005	8.3	1.0	-1.4	-1.6	-6.1	5.1	2.4	-2.7	7.7	5.4
2006	3.9	4.8	-4.3	-3.3	3.2	22.3	4.0	-0.3	2.4	6.3
2007	8.0	7.2	1.5	1.7	0.3	9.3	26.3	3.6	10.6	5.3
2008	-2.5	-1.3	5.9	3.4	2.9	13.6	-11.4	0.0	-5.5	2.5
2009	-3.9	-8.4	-1.4	-1.6	-8.8	-6.7	-20.9	-3.1	-6.3	-8.0
2010	-5.4	-5.2	-1.4	-1.7	-0.6	19.9	16.3	-2.3	-5.3	3.3
2011	1.6	2.0	-1.4	-3.4	-1.5	18.7	18.7	-3.2	2.0	4.5
2012	6.0	9.4	0.0	-1.8	1.1	7.2	5.6	2.2	5.8	4.2
2013	3.0	1.1	-1.4	0.0	0.8	5.0	4.6	1.8	3.0	5.8
2014	3.0	3.3	2.9	1.8	3.6	6.5	3.0	4.6	2.4	6.7
2015	2.5	1.7	0.0	-1.8	1.2	4.3	5.6	2.2	2.8	7.8
2016	2.8	1.1	0.0	0.0	0.5	6.1	4.3	1.4	2.5	6.2

Key Ratios

	IVA/Revenue (%)	Imports/Demand (%)	Exports/Revenue (%)	Revenue per Employee (\$'000)	Wages/Revenue (%)	Employees per Est.	Average Wage (\$)	Share of the Economy (%)
2002	24.27	11.39	8.66	200.88	18.95	37.84	38,069.71	0.00
2003	24.27	12.81	8.13	187.74	20.24	41.92	38,004.03	0.00
2004	23.99	15.53	8.81	195.39	20.08	41.56	39,240.94	0.00
2005	22.37	14.77	8.55	225.49	18.04	39.57	40,685.92	0.00
2006	22.56	15.00	10.06	227.05	17.32	42.66	39,328.20	0.00
2007	22.39	17.13	10.19	244.39	16.61	42.18	40,585.77	0.00
2008	22.65	16.07	11.87	231.54	17.03	41.00	39,430.89	0.00
2009	21.59	13.57	11.53	244.04	17.18	37.90	41,917.50	0.00
2010	21.64	16.67	14.62	232.31	17.74	38.20	41,211.67	0.00
2011	21.72	19.39	17.08	239.64	16.90	38.17	40,508.73	0.00
2012	22.41	19.37	17.27	251.24	16.30	38.61	40,953.45	0.00
2013	22.00	19.67	17.61	256.76	16.12	39.49	41,378.03	0.00
2014	22.08	19.80	18.22	255.14	16.37	39.74	41,768.51	0.00
2015	21.90	20.34	18.53	258.53	16.33	40.20	42,217.48	0.00
2016	21.52	20.68	19.12	264.63	16.11	40.39	42,624.69	0.00

Figures are inflation-adjusted 2011 dollars. Rank refers to 2011 data.

SOURCE: WWW.IBISWORLD.COM

Jargon & Glossary

Industry Jargon

ACTIVATED CARBON FILTER A porous highly adsorptive form of carbon used to remove impurities from oxygen.

FUME HOOD A ventilation device that is designed to limit exposure to hazardous or noxious fumes, vapors or dusts.

OCCUPATIONAL SAFETY & HEALTH

ADMINISTRATION (OSHA) An agency of the US Department of Labor. Its mission is to prevent work-related injuries, illnesses and occupational fatality by issuing and enforcing standards for workplace safety and health.

IBISWorld Glossary

BARRIERS TO ENTRY Barriers to entry can be High, Medium or Low. High means new companies struggle to enter an industry, while Low means it is easy for a firm to enter an industry.

CAPITAL/LABOR INTENSITY An indicator of how much capital is used in production as opposed to labor. Level is stated as High, Medium or Low. High is a ratio of less than \$3 of wage costs for every \$1 of depreciation; Medium is \$3 – \$8 of wage costs to \$1 of depreciation; Low is greater than \$8 of wage costs for every \$1 of depreciation.

CONSTANT PRICES The dollar figures in the Key Statistics table, including forecasts, are adjusted for inflation using 2011 as the base year. This removes the impact of changes in the purchasing power of the dollar, leaving only the 'real' growth or decline in industry metrics. The inflation adjustments in IBISWorld's reports are made using the US Bureau of Economic Analysis' implicit GDP price deflator.

DOMESTIC DEMAND The use of goods and services within the US; the sum of imports and domestic production minus exports.

EARNINGS BEFORE INTEREST AND TAX (EBIT) IBISWorld uses EBIT as an indicator of a company's profitability. It is calculated as revenue minus expenses, excluding tax and interest.

EMPLOYMENT The number of working proprietors, partners, permanent, part-time, temporary and casual employees, and managerial and executive employees.

ENTERPRISE A division that is separately managed and keeps management accounts. The most relevant measure of the number of firms in an industry.

ESTABLISHMENT The smallest type of accounting unit within an Enterprise; usually consists of one or more locations in a state or territory of the country in which it operates.

EXPORTS The total sales and transfers of goods produced by an industry that are exported.

IMPORTS The value of goods and services imported with the amount payable to non-residents.

INDUSTRY CONCENTRATION IBISWorld bases concentration on the top four firms. Concentration is identified as High, Medium or Low. High means the top four players account for over 70% of revenue; Medium is 40–70% of revenue; Low is less than 40%.

INDUSTRY REVENUE The total sales revenue of the industry, including sales (exclusive of excise and sales tax) of goods and services; plus transfers to other firms of the same business; plus subsidies on production; plus all other operating income from outside the firm (such as commission income, repair and service income, and rent, leasing and hiring income); plus capital work done by rental or lease. Receipts from interest royalties, dividends and the sale of fixed tangible assets are excluded.

INDUSTRY VALUE ADDED The market value of goods and services produced by an industry minus the cost of goods and services used in the production process, which leaves the gross product of the industry (also called its Value Added).

INTERNATIONAL TRADE The level is determined by: Exports/Revenue: Low is 0–5%; Medium is 5–20%; High is over 20%. Imports/Domestic Demand: Low is 0–5%; Medium is 5–35%; and High is over 35%.

LIFE CYCLE All industries go through periods of Growth, Maturity and Decline. An average life cycle lasts 70 years. Maturity is the longest stage at 40 years with Growth and Decline at 15 years each.

NON-EMPLOYING ESTABLISHMENT Businesses with no paid employment and payroll are known as non-employing establishments. These are mostly set-up by self employed individuals.

VOLATILITY The level of volatility is determined by the percentage change in revenue over the past five years. Volatility levels: Very High is greater than $\pm 20\%$; High Volatility is between $\pm 10\%$ and $\pm 20\%$; Moderate Volatility is between $\pm 3\%$ and $\pm 10\%$; and Low Volatility is less than $\pm 3\%$.

WAGES The gross total wages and salaries of all employees of the establishment.

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