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Gasping for air: Foreign competition will subdue growth despite improved technology

IBISWorld Industry Report OD4603

Respiratory Protection Equipment Manufacturing in the US

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Jack Curran

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About this Industry

Industry Definition

This industry manufactures respiratory protection equipment, including respirators, masks and accessories, gas masks, respiration air supplying self-contained breathing apparatuses and accessories, respirator filters and accessories, protective films, and powered air-purifying respirator systems and accessories. The industry does not include sleep and breathing aids for consumers with medical conditions since these products are not considered protection equipment.

Main Activities

The primary activities of this industry are

- Manufacturing of respirators
- Manufacturing of masks
- Manufacturing of filters and accessories
- Manufacturing of powered air purifying respirator systems (PAPRs)
- Manufacturing of other respiratory protection equipment

The major products and services in this industry are

- Airline respirators
- Combination air-purifying and air-supplied respirators
- Nonpowered air-purifying respirators
- Powered air-purifying respirators
- Self-contained breathing apparatus and airline combination respirato
- Self-contained breathing apparatus respirators

Similar Industries

33341 Heating & Air Conditioning Equipment Manufacturing in the US
This industry manufactures residential, commercial and industrial ventilation, heating, air-conditioning, refrigeration and freezer equipment.

33911a Medical Instrument & Supply Manufacturing in the US
This industry primarily researches, develops and produces medical instruments and apparatus.

42384 Industrial Supplies Wholesaling in the US
This industry wholesales supplies for manufacturing, oil well and warehousing industries.

Additional Resources

For additional information on this industry

www.cdc.gov/niosh
National Institute for Occupational Safety and Health

www.osha.gov
Occupational Safety and Health Administration

www.isrp.com
The International Society for Respiratory Protection

Industry at a Glance

Respiratory Protection Equipment Manufacturing in 2018

Key Statistics Snapshot

Revenue	Annual Growth 13–18	Annual Growth 18–23
$1.0bn	-3.1%	1.2%
Profit	Exports	Businesses
$49.2m	$372.7m	89

Market Share

3M Company 40.0%

Honeywell International Inc. 34.7%

Mine Safety Appliances 17.4%

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Key External Drivers

Industrial production index

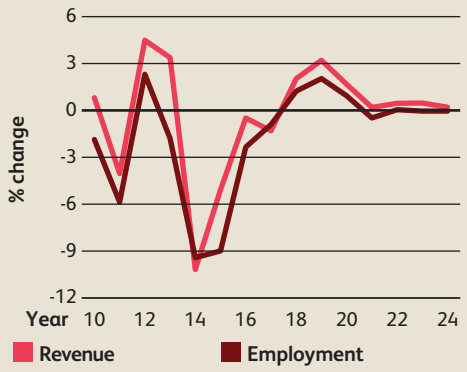
Price of plastic materials and resin

Trade-weighted index

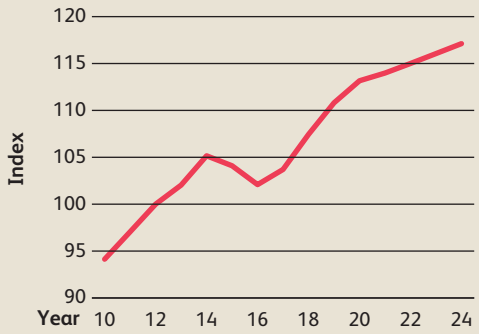
Federal funding for defense

p. 4

Revenue vs. employment growth

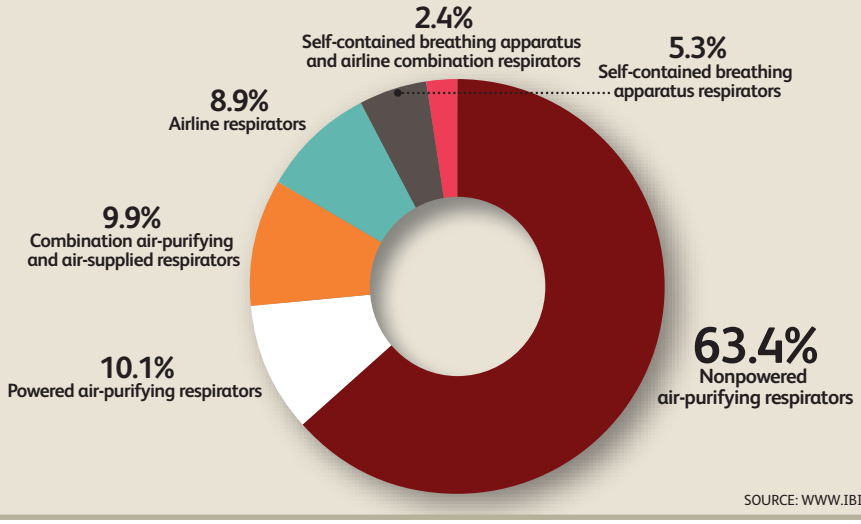


Industrial production index



SOURCE: WWW.IBISWORLD.COM

Products and services segmentation (2018)



SOURCE: WWW.IBISWORLD.COM

Industry Structure

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

FOR ADDITIONAL STATISTICS AND TIME SERIES SEE THE APPENDIX ON PAGE 32

Industry Performance

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

Executive Summary

Over the five years to 2018, the Respiratory Protection Equipment Manufacturing industry has exhibited a decline despite the relatively high prevalence of respiratory diseases among many downstream sectors. For example, the World Health Organization ranks respiratory disease as one of the top six most common workplace ailments, which has incited some downstream markets to invest in respiratory protection devices. The advent of new technologies, namely filter media and exhalation valves, has made it easier for workers to breathe while wearing respiratory devices, thus increasing some workers' compliance with industry products. Moreover, many manufacturers have tailored their respiratory designs to particular end users. For example, manufacturers have started including detectable metal components to help lower food and beverage manufacturers' risk of contamination.

Manufacturers have integrated their products with technology, attracting downstream markets

Additionally, many manufacturers have integrated their products with technology, which has been particularly integral in attracting downstream markets that operate in extreme conditions (e.g. the mining sector). Nevertheless, according to the Occupational Safety and Health Administration (OSHA), respiratory violations were the fourth most commonly cited violation among inspected companies, according to fiscal 2016 data, limiting industry revenue growth. Due to some inspected companies being noncompliant with OSHA respiratory requirements, the cartridge (i.e. filters) change schedule for respiratory device equipment was likely extended over a longer duration, constraining industry revenue. Over the five years to 2018, industry revenue is expected to contract at an annualized rate of 3.1% to $1.0 billion, including a 2.0% increase in 2018. Additionally, profit margins are expected to decline slightly over the five years to 2018, as operators invest in more advanced technology in an attempt to increase demand for their products.

Over the five years to 2023, industry revenue is forecast to grow at an annualized rate of 1.2% to $1.1 billion. Over the next five years, manufacturers will likely tailor their products' cartridge change schedules to individual situations, which will stimulate growth by requiring many downstream markets to purchase filters and other ancillary products more frequently. Additionally, as the industrial production index rises, this may be indicative of more workers requiring respirators and other breathing apparatuses.

Key External Drivers

Industrial production index

The industrial production index (IPI) measures the output from the mining, manufacturing, electric and gas industries. As the IPI rises, so does demand for respiratory protection equipment. In particular, downstream markets that manufacture products with chemical, biological, radiological or nuclear agents will require respiratory protection equipment to comply with the Occupational Safety and Health Administration's respiratory protection standards. In 2018, IPI is expected to increase, presenting an opportunity for the industry.

Price of plastic materials and resin

Plastic materials and resins are key input commodities for respiratory protection

Industry Performance

Key External Drivers continued

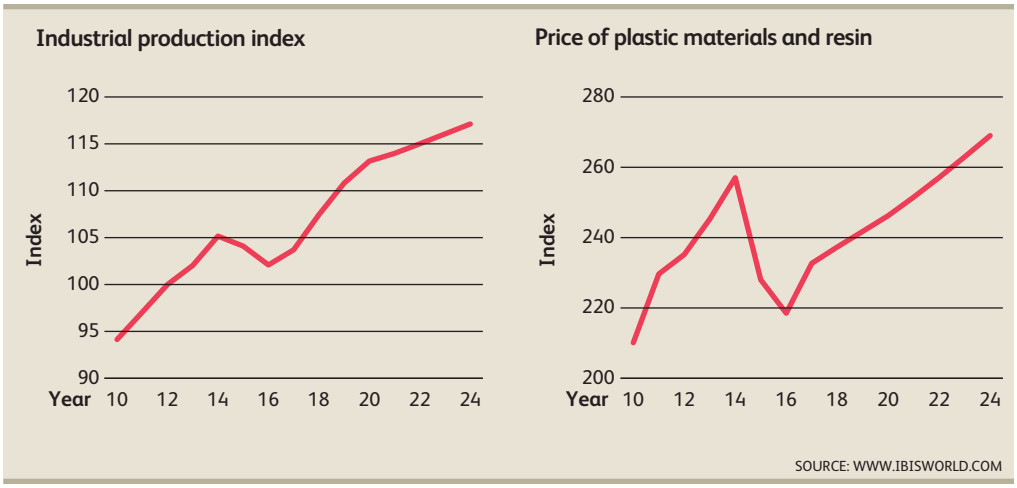
equipment. As these raw material prices rise among strong, price-based competition from foreign manufacturers, the extent to which operators can mark up prices and remain competitive becomes limited; this trend can stifle industry profit. The price of plastic materials and resins is expected to increase in 2018, posing a potential threat to the industry.

Trade-weighted index

As the trade-weighted index (TWI) rises, industry exports become more expensive for global consumers, whereas imports become relatively inexpensive for domestic downstream markets. As a result, this trend intensifies competition for the industry in line with the inundation of respiratory protection equipment produced by foreign manufacturers into the domestic market. In 2018, the TWI is expected to decrease.

Federal funding for defense

As federal funding for defense rises, so does demand for respiratory protection devices. According to the US Army Medical Department, the military may require respiratory protection devices to protect individuals from chemical warfare agents, toxic industrial chemicals and toxic industrial materials. Furthermore, the Department of Defense may use gas masks to protect soldiers that are deployed to war zones. In 2018, federal funding for defense is expected to increase.

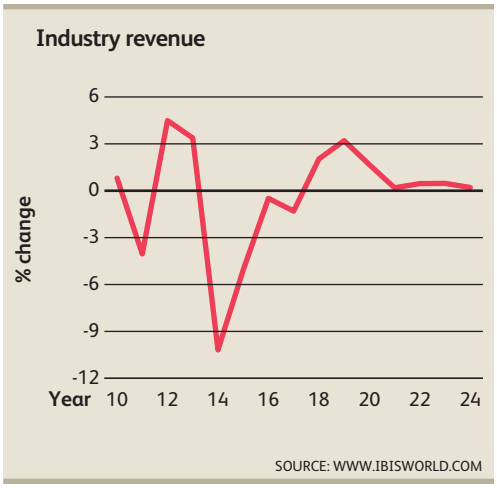


Industry Performance

Current Performance

The Respiratory Protection Equipment Manufacturing industry has declined over the five years to 2018 despite robust demand for respiratory protection devices from some downstream markets. Many respiratory protection equipment manufacturers have increasingly integrated their products with new technologies to attract downstream markets (i.e. construction, manufacturing and mining sectors). For example, some respiratory protection devices feature high-tech alarms, as well as control and battery indicators.

Additionally, some self-contained breathing apparatuses (SCBA) include tracking systems, which have fared well with some downstream markets (i.e. military and firefighter sectors). Still, over the five years to 2018, industry revenue is expected to fall at an annualized rate of 3.1% to $1.0 billion, including growth of 2.0% in 2018. Additionally, profit margins are expected to fall from 6.4% in 2013 to 4.9% in 2018, due to the increased cost of manufacturing more-advanced products.



Downstream demand

Respiratory protection equipment manufacturers have increasingly differentiated their products on the basis of technology, quality and end-user applications. For example, powered air purifying respirators (PAPR) have exhibited robust product innovation over the past five years, with many of these products featuring high-tech alarms, flow controls and battery indicators. Further encouraging this trend, some PAPRs can maintain constant air flow despite changing filter or battery conditions. Overall, SCBA manufacturers have increasingly focused on using smaller, lighter weight cylinders with their respiratory devices, which can help reduce fatigue and enable end users to work in confined spaces. As a result, this product has fared well with the firefighting and military sectors. In addition, more SCBAs feature tracking systems, which have been popular with downstream sectors where employees work in dangerous situations (e.g. firefighters). Closed-circuit, self-containing breathing apparatuses (CCER) have been in high demand for emergency situations. For example, the mining sector, as well as below deck employees in the Navy and Coast Guard, use CCERs.

According to data from the Occupational Safety and Health Administration (OSHA), an estimated 5.0 million workers are required to wear respirators in 1.3 million workplaces in the United States. However, the lack of respiratory protection compliance in many workplaces has caused this issue to be included as the fourth most common OSHA-cited violation. Overall, this trend can be attributed to numerous factors, including workers' misuse of respiratory protection, the lack of OSHA-compliant respiratory programs among downstream markets, workers not undergoing fit tests for respiratory devices and downstream

Industry Performance

Downstream demand continued

markets' use of the incorrect respirator. This trend has dampened industry revenue growth, due to the misuse of respiratory products likely translating to low demand for filter replacements; however, it has also incited manufacturers to focus on product usability to drive sales volumes. For instance, producing comfortable, well-fitted equipment has been an integral component in employees' willingness to correctly use industry products in many downstream markets, which, in turn, stimulates demand for respirators.

International trade

The regulatory landscape has slightly insulated the industry from competition from foreign manufacturers. In particular, closed-circuit escape respiratory devices that function in extreme environments, including end users that work with chemical, biological, radiological and nuclear (CBRN) material, are subject to more stringent regulations. The National Institute for Occupational Safety and Health (NIOSH) and Mine Safety and Health Administration (MSHA) jointly review and approve respirators prior to being used by miners in emergency situations. Furthermore, this regulatory entity mandates that closed-circuit escape devices include design features that enable users to inspect the product and test quality.

Overall, the requirement for manufacturers to include features that enable end users to test quality for closed-circuit escape devices has been particularly integral for some downstream markets. For example, the maritime sector typically handles individual respiratory device units, causing products to physically degrade and potentially displace oxygen production-related chemicals. As a result of this trend, some products, namely closed-circuit escape respiratory devices, have not been exposed to strong price-based competition from foreign manufacturers due to stringent regulations in the United States slightly preventing these manufacturers from tapping into domestic demand. Over the five years to 2018, industry exports are expected to rise at an annualized rate of 1.7% to $372.7 million, as a result of the depreciating US dollar making domestic goods relatively less expensive overseas.

> The regulatory landscape has insulated the industry from competition from foreign manufacturers

Comparatively, industry imports are anticipated to rise at an annualized rate of 11.6% to $231.1 million thanks to robust domestic demand for low-cost dusk masks and other low-tech products that are subject to less stringent regulations. Furthermore, foreign manufacturers have developed a niche in the domestic market, with low-cost disposable respirators that appeal to downstream markets that require light-duty or short-term respiratory protection.

Enterprises and employees

In response to competition from foreign manufacturers, many domestic manufacturers have consolidated. While some manufacturers have been able to garner higher margins from marking up products that are certified for use in the CBRN sectors or SCBAs, which are subject to stringent regulations in the United States, growing import penetration rates have still posed an

Industry Performance

Enterprises and employees continued

issue for the industry. In particular, disposable half-mask respirators may be exposed to high price-based competition due to a lack of high-tech features.

Furthermore, due to the industry's high concentration, many manufacturers have consolidated to remain competitive, thereby having the resources to invest in product innovation. For example, many manufacturers have acquired technology companies to differentiate their product by including more applications for specific end users. Major player 3M Company has focused on making high-tech disposable respirators, which include Advanced Electrostatic Media, thus providing respiratory devices that capture more airborne particles and lower users' breathing resistance. Over the five years to 2018, the number of industry enterprises is expected to increase at an annualized rate of only 0.2% to 89 companies. Comparatively, the number of employees is anticipated to contract an annualized rate of 4.2% to 2,211 over the same period, in line with manufacturers streamlining their research and development and production line facilities.

Industry Performance

Industry Outlook

Over the five years to 2023, the Respiratory Protection Equipment Manufacturing industry is expected to benefit from downstream markets being warier of employees' respiratory health. For example, the Occupational Safety and Health Administration (OSHA) publishes a list of its 10 most commonly cited violations, which includes respiratory protection violations, causing some businesses to be more aware of employee respiratory health issues. Over the next five years, respiratory protection equipment manufacturers will increasingly focus on enhancing respiratory protection, filter technology, design and product usability. For example, during the five-year period, advances in filter media technology and exhalation valves will likely bolster product usability by making it easier for employees to breathe while wearing respiratory protection devices.

Furthermore, many manufacturers will focus on providing more accurate end-of-life indicators to lower users' exposure to airborne gases and vapors. Over the five years to 2023, industry revenue is forecast to grow at an annualized rate of 1.2% to $1.1 billion. Profit is expected to rise from 4.9% of industry revenue in 2018 to 5.0% in 2023, as industry consolidation enables many manufacturers to focus on developing new technologies, thereby enabling operators to garner higher prices for high-tech devices.

End-of-life indicators undergo change

Over the next five years, product development will be integral for respiratory protection equipment manufacturers to differentiate their products from foreign manufacturers. For example, manufacturers will likely change their recommended cartridge schedule, which may include a filter to remove particles. Instead of producing respiratory protection devices that have a fixed end-of-life indicator, more manufacturers will focus on tailoring the cartridge schedule to particular downstream markets. As a result of this trend, demand for the industry's ancillary products (i.e. filtering face pieces, cartridges and canisters) will likely rise. Thanks to many manufacturers having ancillary products that only work in conjunction with their product, changes in the cartridge schedule will increase sales volumes for many manufacturers. In addition, the advent of new technologies will be vital in shaping demand for industry products. For instance, many air-purifying respirators will increasingly feature circuit boards to manage flow rates, as well as low battery alarms, thus inciting more downstream markets (e.g. construction) to purchase these products. Overall, manufacturers will introduce products that feature advanced flow systems, including respirators that work in high altitudes, lithium battery technologies and visual, audible and vibratory alarms, to the market.

Downstream markets will be quick to purchase industry products

Downstream markets will be quick to purchase industry products due to respiratory violations being the fourth most cited violation in fiscal 2016 (latest data available), according to data from OSHA. OSHA has a myriad of violation penalties, which are set incrementally higher for employees that were exposed to physical harm or death. In addition, repeat violations can result in a significant fine of up to $70,000 for each violation within the previous three years. As a result, companies that have repeat violations will likely focus on complying with respiratory protection requirements. In particular, common violations of respiratory protection standards include

Industry Performance

End-of-life indicators undergo change continued

end users' lacking medical evaluations for workers that require respirators, not providing initial and annual fit testing services and letting respirators to be worn with a beard. According to data from 3M Company, for every dollar invested in safety programs, including respiratory safety, downstream markets can save four to six dollars in costs related to worker injury and illness.

To lower noncompliance costs, many downstream markets will focus on providing proper fit tests, training workers on respiratory programs and selecting appropriate equipment based on workers' exposure to hazardous materials. In response, industry operators will focus on bolstering workers' compliance with respiratory products by enhancing usability and product design. For example, products that feature greater comfort and conform to the user's face will be in high demand. Further exacerbating this trend, many manufacturers will create flexible self-contained breathing apparatuses (SCBA) that let the back frame move with the worker, effectively reducing the product's strain on pressure points and enhancing comfort. All in all, workers' degree of site compliance will be strongly linked to the product's usability, thereby inciting more manufacturers to create products that fit a myriad of face shapes and do not interfere with workers' use of other equipment (e.g. hard hats and eyewear).

Regulations play a role in international trade

The regulatory environment will have mixed effects on the industry over the next five years. For example, the Centers for Disease Control and Prevention released a new fee schedule for respiratory manufacturers, effective since September 2014, which charges manufacturers a fixed testing fee for products that work with chemical, biological, radiological and nuclear (CBRN) defense agents. These products must be approved by the National Institute for Occupational Safety and Health. While manufacturers contended with higher fees for product testing for devices that will be exposed to CBRN agents, higher fees may also act as a deterrent to foreign manufacturers' exporting their products to the domestic market. Over the five years to 2023, the number of industry exports is projected to increase at an annualized rate of 3.0% to $431.5 million, likely due to many emerging economies implementing more stringent regulations for workers' exposure to hazardous particulates, thereby stimulating demand for high-tech equipment.

The regulatory environment will have mixed effects on the industry

Comparatively, during the five-year period, the number of industry imports is anticipated to grow at an annualized rate of 2.6% to $262.7 million, in line with global manufacturers continuing to inundate the domestic market with low-cost disposable respiratory protection devices. In the five years to 2023, the number of industry enterprises is expected to increase at an annualized rate of 1.3% to 95 companies, driven by some industry operators expanding their departments that develop new technologies, particularly departments that focus on respiratory device comfort and durability. The number of industry employees is expected to increase at an annualized rate of 0.5% to 2,266 during the five-year period.

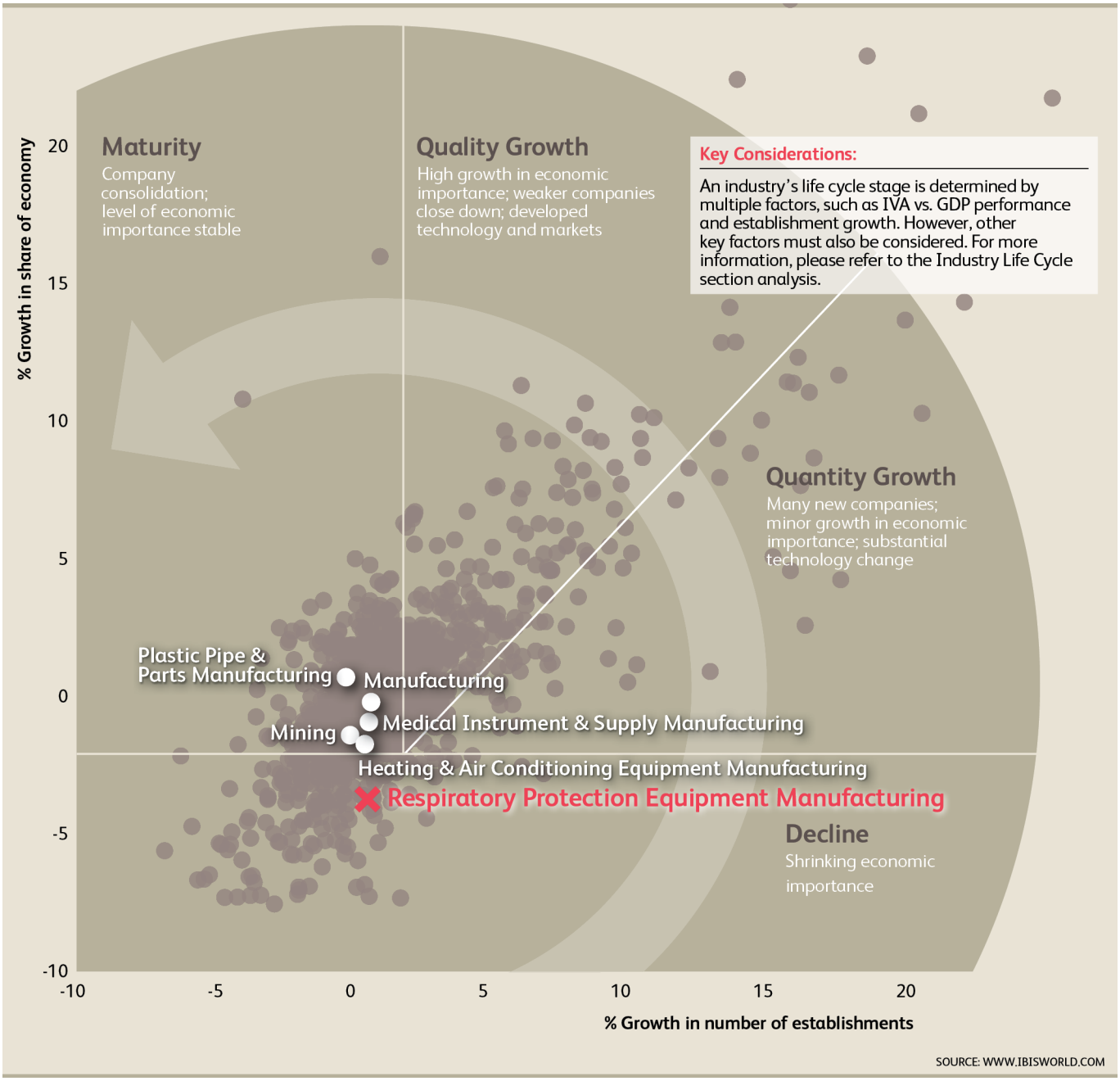
Industry Performance

Life Cycle Stage

Industry value added is expected to fall over the 10 years to 2023

Safety equipment requirements ensure continued demand for industry products

The industry is experiencing a period of consolidation



SOURCE: WWW.IBISWORLD.COM

Industry Performance

Industry Life Cycle

This industry is **Mature**

The Respiratory Protection Equipment Manufacturing industry is currently in the mature life cycle stage. During the 10 years to 2023, industry value added (IVA), which measures an industry's contribution to the overall economy, is expected to fall at an annualized rate of 1.7%. Comparatively, US GDP is anticipated to rise at an annualized rate of 2.2% during the same period. Overall, due to the multitude of downstream markets that require industry products, including construction, manufacturing, firefighters and military, among other end users, the industry has managed to maintain demand. Furthermore, thanks to the National Institute for Occupational Safety and Health mandating that many downstream markets purchase respiratory devices for their employees, this trend has buoyed industry revenue growth. However, the industry is considered mature, due to many respiratory protection equipment manufacturers deriving growth from product differentiation.

For example, during the 10-year period, many manufacturers will look toward integrating new technology into their products, such as high-tech alarms, flow controls and battery indicators. Additionally, the industry is consolidating, which is indicative of an industry in the mature life cycle stage. During the 10 years to 2023, the number of industry enterprises is expected to increase at an annualized rate of 0.8% to 95. Overall, industry operators will consolidate to have the cost synergies necessary to acquire technology companies and invest in research and development. For instance, new technologies will enable industry manufacturers to tap into demand from downstream markets, such as respirators that work in high altitudes appealing to some mining sectors.

Products & Markets

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

Supply Chain

KEY BUYING INDUSTRIES

21 **Mining in the US**
The mining sector primarily uses respiratory protection products that offer particulate filtration.

31-33 **Manufacturing in the US**
The manufacturing sector uses respiratory protection products for a wide variety of applications.

62423 **Natural Disaster & Emergency Relief Services in the US**
This industry demands respiratory protection equipment for the potentially hazardous situations posed by natural disasters, including gas leaks and fires.

KEY SELLING INDUSTRIES

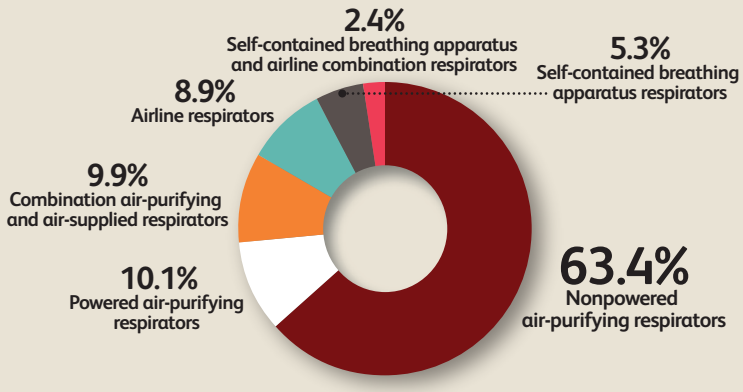
32612 **Plastic Pipe & Parts Manufacturing in the US**
This industry supplies plastic profile shapes, such as tubing and sausage casing.

32622 **Hose & Belt Manufacturing in the US**
This industry supplies rubber hose and reinforced plastic hose for the manufacture of respiratory protection equipment.

33242 **Metal Tank Manufacturing in the US**
This industry supplies the gas storage tanks used in some respiratory protection devices.

Products and Services

Products and services segmentation (2018)



Total $1.0bn

SOURCE: WWW.IBISWORLD.COM

Nonpowered air-purifying respirators

In 2018, nonpowered air purifying respirators (APR) are expected to account for 63.4% of total revenue. There are three types of APR series, including the N, R and P series. The N series includes nonpowered air-purifying respirators for workplaces that do not have oil aerosols, whereas the R and P series are used for removing oil-based liquid particles. The advantages of nonpowered air-purifying respirators are that they are lightweight, are typically low cost (compared with other respirators) and do not restrict worker mobility. Over the next five years, demand for other respirator models will constrain demand for this product segment.

Products & Markets

Products and Services continued

Powered air-purifying respirators

Powered air-purifying respirators are expected to comprise 10.1% of total revenue on 2018. Powered air-purifying respirators (PAPR) feature air-purifying filters, with purified air being delivered via positive pressure. Typically, workers need PAPRs when disposable or reusable air-purifying respirators do not provide sufficient protection. According to the US Department of Health and Human Services' Radiation Emergency Medical Management, PAPRs provide greater protection and superior comfort compared with APRs. However, there are some disadvantages with using PAPRs; for example, PAPRs are not considered true positive-pressure devices (due to contaminated air leaking into the mask, helmet or hood) and can make communication difficult. In addition, one drawback of using PAPRS is that they require a fully charged battery to work properly. Nevertheless, the Occupational Safety and Health Administration considers PAPRs as positive pressure devices, meaning that PAPRs typically do not have fit testing requirements. Over the past five years, this product segment has grown.

Airline respirators

Airline respirators are expected to generate 8.9% of total revenue. Airline respirators provide continuous air flow to the face piece via an external source, with face pieces including either half- or full-face pieces. In addition, this product features a breathing tube and air flow control valve. This product segment features two types of airline respirators, including pressure demand (delivers air when the user requires it) and constant flow (delivers air continuously) respirators. According to the National Institute for Occupational Safety and Health, airline respirators can be used by workers that do not work in work sites that are hazardous to their life or health, or environments where the user can escape without the use of a respirator. Due to some airline respirators featuring versatility, such as airline respirators that are tailored to specific end-user applications, demand for this product segment is expected to grow.

Self-contained breathing apparatus respirators

In 2018, self-contained breathing apparatus (SCBA) respirators are expected to make up 5.3% of total revenue. SCBAs feature air tanks to supply clean air, thus protecting users against high chemical concentrations. Typically, SCBAs are used by firefighters. However, there are some disadvantages of using SCBAs, such as SCBAs typically being heavy (most are 30 pounds or more) and requiring specific training. Moreover, SCBAs last for a short period of time, with air tanks only lasting about an hour or less. Over the next five years, this product segment is expected to remain stable, partly due to stringent fire department budgets limiting the extent that firefighters access new, high-tech SCBAs.

Demand Determinants

Demand for the Respiratory Protection Equipment Manufacturing industry is influenced by numerous factors, including product quality, the number of individuals that come into contact with hazardous materials and worker safety laws. Overall, product quality is a key determinant of demand for industry products, due to industry products needing to protect some employees from respiratory diseases. Furthermore, product usability is vital, which has incited manufacturers to invest in filter media technologies and exhalation valves

Products & Markets

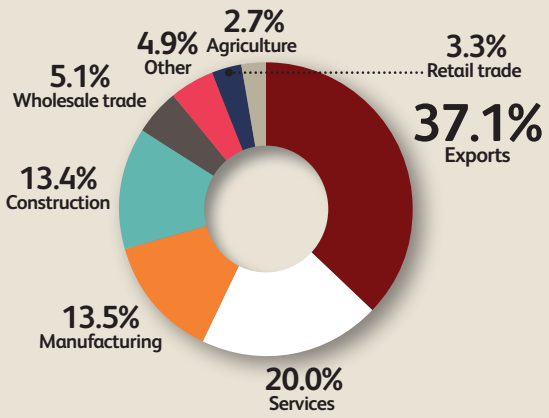
Demand Determinants continued

to enable workers to breathe easier while using industry products. Over the next five years, as manufacturers likely develop products that reduce workers' exposure to airborne gases and vapors, demand for industry products will rise. All in all, the number of employees hired by downstream markets that are particularly susceptible to occupational lung diseases (i.e. construction and firefighting sectors) will determine demand for respiratory protection equipment.

Furthermore, regulations require organizations to provide a certain degree of protection for workers in hazardous operating environments. Demand can increase if regulations become more stringent and require organizations to purchase more expensive equipment. As a result, price is a secondary demand determinant. Nonetheless, producers of similar protective breathing gear may manufacture it at different price points to gain a competitive edge.

Major Markets

Major market segmentation (2018)



Total $1.0bn

SOURCE: WWW.IBISWORLD.COM

According to data from the World Health Organization, respiratory disease is one of the top six most common workplace illness, which has stimulated demand for respiratory protection equipment from downstream markets. In addition, according to the Centers for Disease Control and Prevention, about 5.0% of all US workers must wear a respirator at least some of the time while performing their job. This percentage encompasses jobs in about 20.0%, or 1.3 million, of establishments, including 900,000 businesses that employ fewer than 20 people. This market breakdown includes demand for respiratory equipment from private sector businesses.

Services sector

The services sector generates 20.0% of total revenue. In particular, strong demand for respiratory equipment from the services sector is driven by companies that provide health and auto repair services. Among auto service providers, employees need respiratory equipment if the auto repair provider offers the following services: spray painting services, dry sanding, solvents, paint mixing, spray gun cleaning and other

Products & Markets

Major Markets continued

tasks. Comparatively, health service providers need respirators to lower healthcare providers' exposure to airborne contaminants, which is particularly vital to mitigate providers' exposure to influenza. Over the next five years, demand from this market segment is expected to grow, partly driven by the burgeoning elderly population spurring demand for healthcare services.

Manufacturing sector

The manufacturing sector encompasses many downstream markets, including food and beverage, pharmaceutical and chemical manufacturers. Respiratory device manufacturers need to protect manufacturing workers from particulate hazards. The food manufacturing sector requires devices to come in a highly visible color, as well as exclude detectable components to prevent contamination. Furthermore, food and pharmaceutical manufacturers typically require respiratory devices that are designed without staples or small, detachable components. In 2018, this market segment is expected to make up 13.5% of industry revenue, which has grown in line with revitalization in many manufacturing sectors.

Construction

Construction and maintenance are anticipated to account for 13.4% of industry revenue. Construction workers are typically exposed to respiratory hazards, including dusts, gases, fumes, mists and vapors. Typically, a common toxic gas in the construction sector includes carbon monoxide from engine exhaust. Furthermore, toxic vapors can be attributed to materials in paints, coatings and degreasers, as well as fumes from welding, coal tar and diesel engines. As a result, this market segment has demanded air-purifying respirators, including nonpowered and powered devices, over the past five years.

Wholesale and retail trade

Wholesale trade accounts for 5.1% of total revenue. Wholesalers may require respiratory equipment to handle the distribution of chemicals, among other products. As wholesale bypass has become increasingly prevalent over the past five years, wholesalers' demand for respiratory equipment has declined. Retail trade generates 3.3% of total revenue. Some retailers, such as building material and garden supply as well as automotive dealers and service stations, may require respiratory equipment. Over the past five years, slight growth in demand from retailers has offset weak demand for respiratory equipment from wholesalers, causing this market segment to grow.

Exports

In 2018, exports are expected to account for 37.1% of industry revenue. Over the past five years, industry exports are expected to increase, which has been partly driven by growing wariness of respiratory protection for pandemics in emerging economies. For example, many healthcare providers that provide care to patients that have respiratory illnesses, particularly during pandemic influenzas or emerging infectious diseases, have demanded respiratory protection devices.

Products & Markets

International Trade

Level & Trend

Exports in the industry are **High** and **Steady**

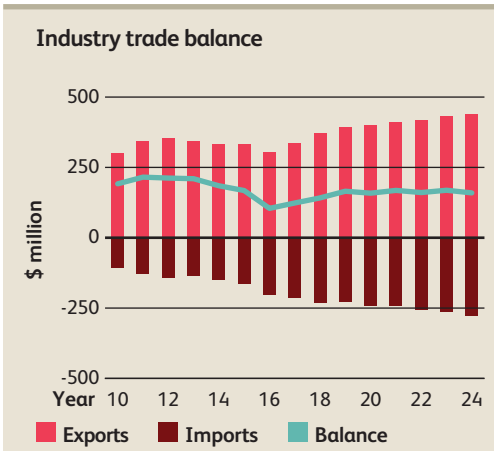
Imports in the industry are **Medium** and **Increasing**

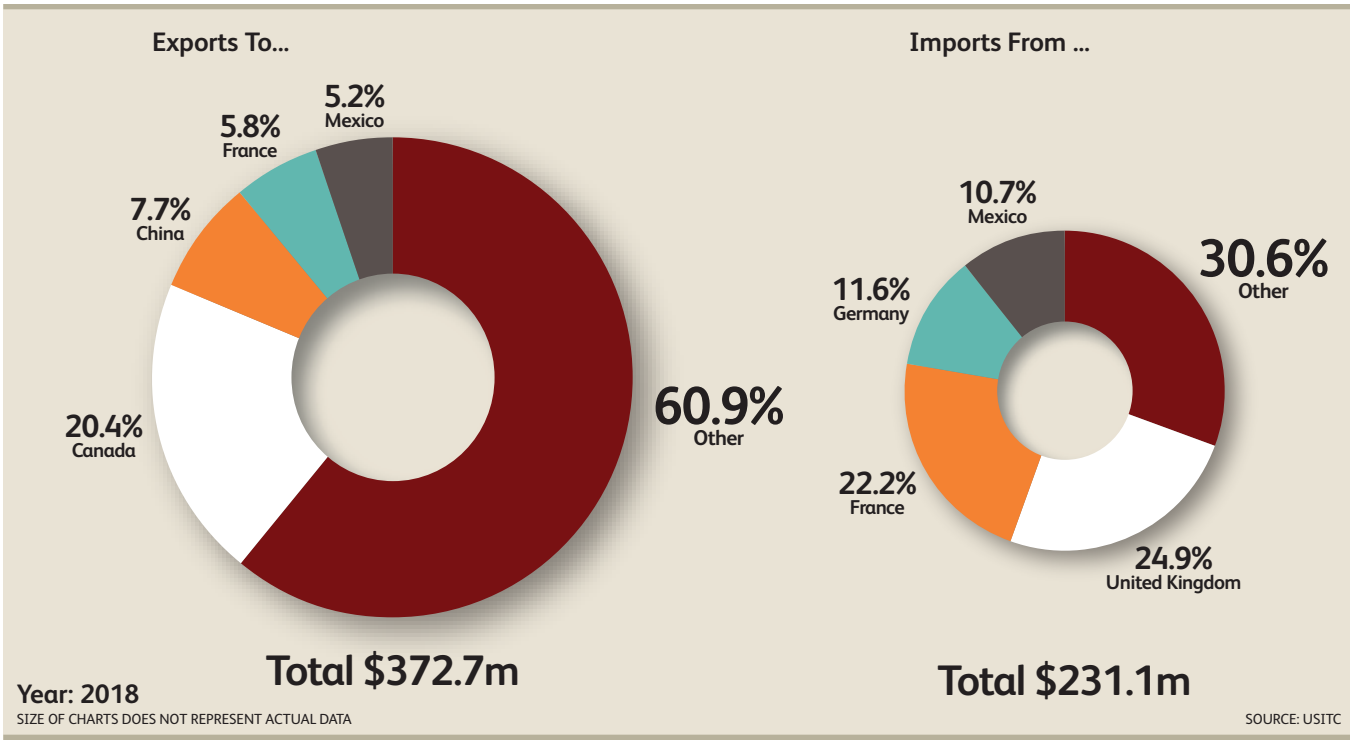
Imports

Over the five years to 2018, imports for the Respiratory Protection Equipment Manufacturing industry are expected to grow at an annualized rate of 11.6% to $231.1 million. Many domestic manufacturers have offshored their respiratory device manufacturing facilities, namely low-tech products, such as dusk masks. As a result of this trend, many domestic downstream markets have purchased low-cost, albeit low-tech, respiratory products manufactured by foreign producers. Furthermore, as many medical device manufacturers have expanded globally, this trend has intensified competition in line with many globally-based companies including respiratory devices in their product portfolio.

Exports

In the five years to 2018, industry exports are anticipated to rise at an annualized rate of 1.7% to $372.7 million. Domestic respiratory protection equipment manufacturers have appealed to globally-based downstream markets by having products that are tailored toward a particular market niche. For example, some respiratory device manufacturers, to garner sales volumes from the food manufacturing sector, have created respiratory devices that are designed without staples or small, detachable parts.





Products & Markets

Business Locations 2018



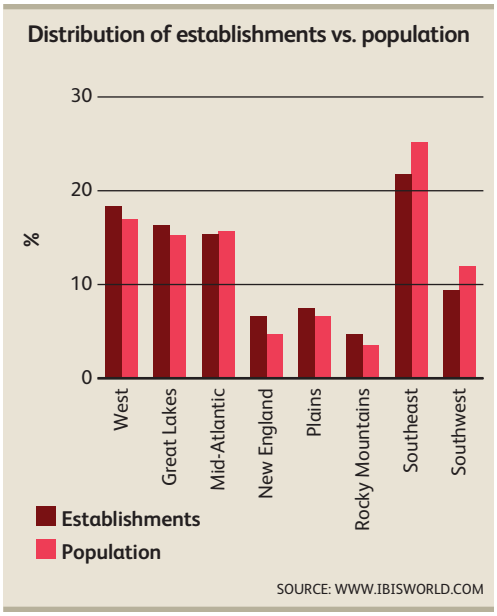
SOURCE: WWW.IBISWORLD.COM

Products & Markets

Business Locations

IBISWorld estimates that Respiratory Protection Equipment Manufacturing industry establishments are most highly concentrated in the West and Southeast regions of the United States. In general, manufacturing activity tends to follow population densities across the country. Also, regions with access to ports that facilitate trade and create logistical efficiencies with regard to supply chains also appeal to manufacturers from various sectors. In regard to the Respiratory Protection Equipment Manufacturing industry, the Southeast is the most dominant region, due in part to the location of major players Mine Safety Appliances (MSA) and Honeywell International Inc., which both have multiple locations there. For example, MSA has production facilities in Jacksonville, NC.

Overall, the Respiratory Protection Equipment Manufacturing industry is concentrated in the Southeast, which accounts for 21.8% of total establishments, followed by the West (18.3%), Great Lakes (16.3%) and Mid-Atlantic (15.4%) regions. Industry operators typically locate their production facilities near downstream markets, such as companies that operate in the following sectors: service; construction; manufacturing; wholesale trade; retail trade; agriculture; mining and transportation; and public utilities.



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 **High**

The Respiratory Protection Equipment Manufacturing industry is characterized by a high level of market share concentration. In particular, the industry is highly concentrated in the following product segments, including respiratory products that are tailored toward demand from some downstream sectors (i.e. healthcare, police and military). Furthermore, by having a product portfolio of respiratory devices that are chemical, biological, radiological and nuclear (CBRN) defense certified, some companies have managed to garner a large share of industry revenue. Overall, in 2018, the top four respiratory protection equipment manufacturers are expected to account for 95.5% of industry revenue.

Over the five years to 2018, the industry has largely been dominated by large manufacturers that also produce other technological equipment, thereby creating cost synergies related to investing in research and development for product innovation. Additionally, over the past five years, many foreign manufacturers have developed a strong foothold in low-quality dust mask production. As a result of this trend, many industry operators have focused on developing high-quality products integrated with technology, such as including circuit boards that manage air flow rates.

Key Success Factors

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

Having a good reputation

Customers' purchase criteria often include reliability and performance. Reliability of delivery and product performance are particularly important given that a person's health can be at stake.

Economies of scale

Large companies are better able to spread fixed costs across several products, maintain negotiating power with wholesalers and customers, and gain access to a greater pool of talent.

Access to highly skilled workforce

Many industry employees, especially in key management, engineering, sales and marketing positions, are highly skilled. Therefore, competition for personnel is intense.

Undertaking technical research and development

Future revenue streams are based on significant investment in research and development, which can result in product improvements and successful product launches.

Cost Structure Benchmarks

Profit

In 2018, profit, measured as earnings before taxes and interest, is expected to make up 4.9% of revenue for the Respiratory Protection Equipment Manufacturing industry. Over the five years to 2018, industry profitability has fallen from 6.4% of industry revenue. Over the past five years, input costs have increased as commodity prices have fluctuated. Additionally, some industry operators have invested in making their products more high-tech, such as adding circuit boards to control flow rates in powered air purifying respirators, thereby adding to operational costs. In addition, many manufacturers have included advanced flow control systems (which enables products to work in high altitudes), lithium battery technology and alarms for air flow and batteries to their products.

Competitive Landscape

Cost Structure Benchmarks continued

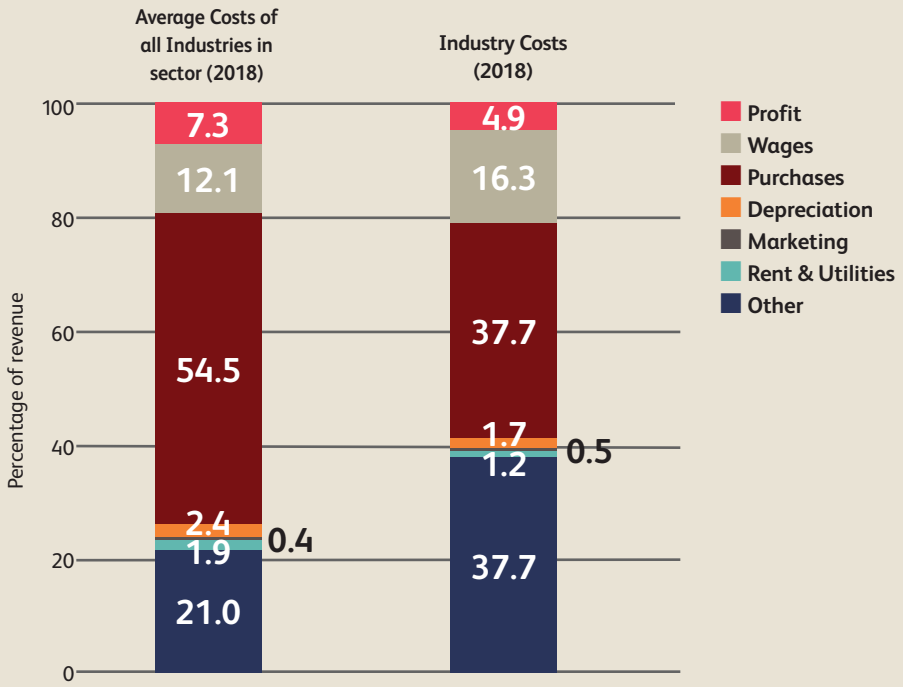
Purchases

Purchases are expected to comprise the largest expense for the industry, with 37.7% of total industry revenue. Typically, respiratory equipment manufacturers purchase intermediate components, including face blanks, second skins, drink tubes, nose cups and outlet valves, which, in turn, are used as input commodities to manufacture respiratory devices. Overall, purchase costs may vary in line with the manufacturers' downstream market. For example, downstream markets in the chemical, biological, radiological and nuclear (CBRN) sectors may have more specialized requirements for respiratory devices. As a result, industry manufacturers' purchase costs may rise in line with purchasing coatings for additional protection. Additionally, manufacturers need to purchase raw materials, such as plastic materials and resin. Over the past five years, volatility in input commodity prices, such as the price of crude oil (which is used as a raw material for plastic production), have added to purchase costs for the industry.

Wages

In 2018, wages are anticipated to account for 16.3% of industry revenue. Over the past five years, wages as a share of industry revenue have decreased slightly as a result of industry consolidating. As companies have merged and purchased smaller operators, they have eliminated employment redundancies and reduced their need for staff. However, some manufacturing employees need to be aware of regulations for respiratory devices, which typically vary in line with the downstream sector, thereby adding to wage costs for the industry. For example, downstream markets in the CBRN sectors or government (i.e. aerospace)

Sector vs. Industry Costs



SOURCE: WWW.IBISWORLD.COM

Competitive Landscape

Cost Structure Benchmarks continued

will likely have more specific requirements for respiratory devices, thereby requiring slightly specialized manufacturers.

Other costs

Other expenditures include freight, insurance and costs associated with environmental law compliance. In recent years, environmental compliance costs have risen in line with the US Environmental Protection Agency implementing more stringent regulations for emissions related to the manufacturing processes. Research and development expenditures have risen over the past five years, thanks to product innovation becoming increasingly prevalent to generate sales volumes. Comparatively, depreciation is expected to absorb 1.7% of industry revenue.

Basis of Competition

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

Internal competition

The Respiratory Protection Equipment Manufacturing industry is characterized by moderate competition. Overall, respiratory equipment manufacturers primarily compete on the basis of quality, due to industry products needing to promote long-term health outcomes for workers that may be exposed to hazardous materials. Additionally, product characteristics, such as agency approvals, functionality, user comfort and branding are key measures of product quality. In particular, companies that offer innovative features for respiratory products that boost usability (i.e. lighter equipment) or use high-performance materials may be more competitive. Furthermore, customer service and marketing may play an integral role in developing brand recognition for customers, thus presenting a competitive advantage for some companies.

Price-based competition is also integral to remaining competitive. For example, respiratory equipment manufacturers that can manufacture both high-quality products, albeit at low prices, will benefit from robust demand from downstream markets (i.e. the healthcare sector). Thanks to the industry being highly concentrated, larger manufacturers have had the leverage necessary to secure low-cost input commodities (i.e. face blanks, second skins, drink tubes and other intermediate products used to make respiratory devices). As a result of larger manufacturers realizing some cost synergies from securing input commodities, these companies have been able to invest in research and development for product innovation. As more downstream sectors (i.e. chemical, biological, radiological and nuclear production companies) focus on limiting or preventing workers' exposure to hazardous materials, this trend will spur demand for high-tech equipment.

Product diversity is another important competitive factor. The ability to provide a range of self-contained breathing apparatus and respiratory masks to a variety of downstream industries is important in the industry. While many smaller manufacturers target key markets, such as government, construction or mining operators, companies that provide a more extensive product range may experience robust product sales volumes despite a particular sector's poor performance.

External competition

Companies in this industry primarily compete with imports from foreign manufacturers because there is no direct substitute for respiratory protection equipment. Over the past five years, industry imports have steadily risen, as many foreign companies have entered

Competitive Landscape

Basis of Competition continued

the market and have developed low-cost dusk masks, among other market niches.

Barriers to Entry

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

The Respiratory Protection Equipment Manufacturing industry exhibits high barriers to entry. High start-up costs, coupled with wait times for regulatory approval, are key barriers to entry for potential industry entrants. Respiratory equipment has increasingly been integrated with new technologies over the past five years, which has posed as a barrier for new industry entrants. Many larger respiratory equipment manufacturers have acquired technology companies, which has streamlined research and development costs related to product innovation. Further adding to barriers to entry for new companies, many existing players have a strong presence in particular downstream markets (i.e. agricultural, chemical, construction, fire protection, food services, manufacturing, medical, mining, nuclear, oil and gas, pharmaceuticals and welding, among other sectors) which makes it arduous for new industry entrants to tap into downstream market demand.

Additionally, some products, to protect workers from airborne particulates, biohazard materials, chemicals, contamination, extreme environments, gas vapors and smoke, among other applications, need to meet testing and licensing requirements, which adds to the industry's barriers. Also, manufacturers need to have a workforce of engineers, designers, management and other employees. While this may not be considered a barrier to entry for new industry entrants, it may be difficult to acquire employees that have knowledge of downstream markets' requirements for respiratory devices. Furthermore, many larger manufacturing companies have a product portfolio that includes additional products, such as firefighter protection gear and thermal imaging cameras, which may drive demand for industry products.

Barriers to Entry checklist

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

SOURCE: WWW.IBISWORLD.COM

Industry Globalization

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

While the major companies in the Respiratory Protection Equipment Manufacturing industry are all US-owned and operated, they also have significant manufacturing and sales facilities abroad. Over the five years to 2023, global demand for respiratory protection equipment will likely rise, thanks to more countries implementing more stringent regulations for working conditions in many downstream markets, including chemical, biological, radiological and nuclear production companies.

Competitive Landscape

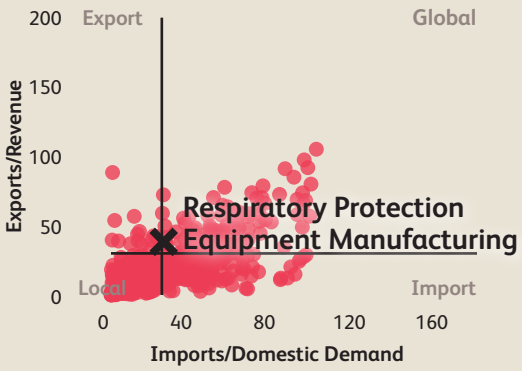
Industry Globalization continued

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

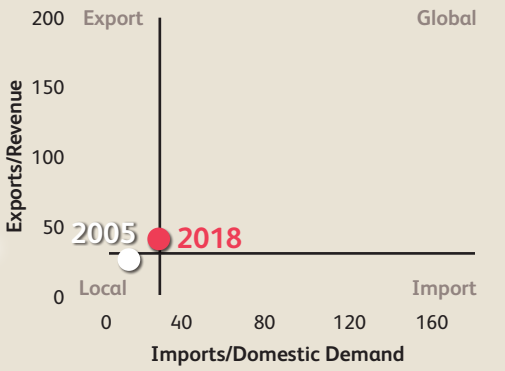
Exports offer growth opportunities for firms. However there are legal, economic and political risks associated with dealing in foreign countries.

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

Trade Globalization



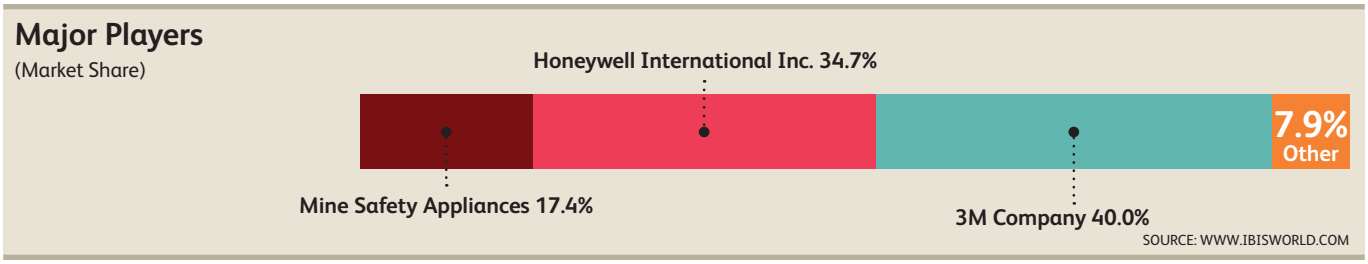
Going Global: Respiratory Protection Equipment Manufacturing 2005–2018



SOURCE: WWW.IBISWORLD.COM

Major Companies

3M Company | Honeywell International Inc.
Mine Safety Appliances | Other Companies



Player Performance

3M Company
Market Share: 40.0 %
Industry Brand Names
Versaflo

Founded in 1902 and incorporated in 1929, 3M Company (3M) is a diversified technology company headquartered in St. Paul, MN. With an estimated 89,800 global employees, the company is one of the largest suppliers of personal protection equipment. In 2014, the company donated about one million disposable respirators to help doctors and aid workers protect themselves from Ebola. In 2013, the company expanded its product portfolio of respirators for the healthcare sector. For example, 3M developed the VFlex 1805 and Aura 1870+ models, which combine the protection of a respirator and the fluid resistance of a surgical mask. In particular, these low-priced respiratory models are demanded by hospitals, day surgery centers, nursing homes, clinics and other healthcare facilities. Also, in 2013, the company added the 6500 series to its respiratory product portfolio, which is aimed to tap into the five million workers in the United States that are exposed to harmful dusts, gases, vapors and sprays.

3M's respiratory protection equipment includes reusable half-face, full-face and escape respiration solutions in powered and supplied-air varieties. In particular, the company's Versaflo line of powered and supplied-air systems features modular components (e.g. headgear, tubes and air sources) that can be combined to create customized solutions for specific applications. The line also features rechargeable batteries and removable parts for easier maintenance. The major markets for these products include healthcare, industrial and mining companies.

Financial performance

While respiratory equipment is included in the company's safety and graphics

3M Company (US industry-specific segment) - financial performance*

Year	Revenue ($ million)	(% change)	Operating Income ($ million)	(% change)
2013	293.9	10.0	64.6	8.0
2014	316.5	7.7	71.6	10.8
2015	329.2	4.0	77.9	8.8
2016	357.1	8.5	84.4	8.3
2017	360.4	0.9	86.4	2.4
2018	402.2	11.6	111.0	28.5

*Estimates

SOURCE: ANNUAL REPORT AND IBISWORLD

Major Companies

Player Performance continued

business segment, the company does not segment out revenue relevant to the Respiratory Protection Equipment Manufacturing industry; as a result, industry-relevant revenue is estimated. Over the five years to 2018, industry revenue is expected to grow at an annualized rate of 6.5% to $402.2 million. Over the past five years, robust demand for respiratory equipment from the healthcare, industrial and construction sectors spurred industry revenue growth. However, the company has grappled with liabilities that have cut into industry-relevant growth.

For example, in 2015, the company incurred $46.0 million in legal fees and settlements related to litigation for its respirator mask and asbestos. Moreover, excluding the company's Aearo products, the company incurred $144.0 million in respirator mask and asbestos liabilities. Some companies, namely Aearo and other companies that previously owned Aearo's respiratory business, have filed a lawsuit against 3M with allegations that the company's masks and respiratory products still exposed workers to asbestos, silica, coal mine dust and other hazardous materials.

Player Performance

Honeywell International Inc.
Market Share: 34.7 %
Industry Brand Names
Sperian
North

Incorporated in 1985 and employing over 129,000 employees worldwide, Honeywell International Inc. (Honeywell) is a technology and manufacturing company that provides products for a multitude of downstream sectors. The company's product portfolio caters to the aerospace, construction, automotive, specialty chemicals, electronics, refining and petrochemical sectors. The company has operations in multiple business segments, including aerospace, automation and control solutions, specialty materials and transportation systems. However, industry-relevant revenue is derived from the company's gas detection products and systems, which is a subsegment within the company's security and life safety product line.

Respiratory protection equipment is marketed through the company's North and Sperian brands. Each brand features a full line of half-mask, full-face, supplied-air and escape respirators and self-contained breathing apparatus (SCBAs). The company's North brand also offers solutions for airlines. Most

Honeywell International Inc. (US industry-specific segment) - financial performance*

Year	Revenue ($ million)	(% change)	Operating Income ($ million)	(% change)
2013	277.4	6.2	27.9	37.4
2014	277.5	0.0	29.2	4.7
2015	263.1	-5.2	32.5	11.3
2016	299.0	13.6	36.6	12.6
2017	322.8	8.0	13.2	-63.9
2018	348.7	8.0	14.4	9.1

*Estimates

SOURCE: ANNUAL REPORT AND IBISWORLD

Major Companies

Player Performance continued

Sperian-branded respiratory products are approved by the National Institute for Occupational Safety and Health. The company markets its respiratory protection equipment to the agricultural, industrial, construction, government and first-responder markets.

Financial performance

Honeywell does not segment out industry revenue; as a result, its industry-relevant revenue is estimated. Over the five years to 2018, industry-relevant revenue is expected to grow at an annualized rate of 4.7% to $348.7 million. Further adding to industry revenue growth, robust demand for respiratory equipment from the industrial, chemical, refining, petrochemical and semiconductor plants has spurred demand for respiratory equipment to mitigate workers' exposure to hazardous materials.

Player Performance

Mine Safety Appliances
Market Share: 17.4%

Founded in 1914 and employing over 5,000 people worldwide, Mine Safety Appliances (MSA) is a global leader in developing, manufacturing and supplying products that protect individuals' health and promote safety. In particular, the company's products are used by the following downstream sectors: oil and gas, fire service, mining and construction. Industry-relevant products include SCBAs and gas masks, among other respiratory products. Furthermore, the company's SCBA products are used by petrochemical plant workers, as well as responders to protect against exposure to chemical, biological, radiological and nuclear agents. Additionally, the company's air-purifying respirators include full-face and half-mask respirators for industrial workers that may be exposed to hazardous gases, chemicals, vapors and particulates, as well as painters and construction workers.

Industrial, hazmat and remediation workers, which typically have long-term exposure to hazardous materials, may require powered air-purifying respirators. Also, escape respirators are marketed toward law enforcement, government workers and other customers that may need to escape hazardous environments unexpectedly and quickly. Products are sold through indirect (i.e. distributor) and direct (i.e. straight to consumer) sales channels.

Mine Safety Appliances Company (US industry-specific segment) - financial performance*

Year	Revenue ($ million)	(% change)	Operating Income ($ million)	(% change)
2013	116.2	10.1	9.0	8.4
2014	100.9	-13.2	7.8	-13.3
2015	160.3	58.9	9.9	26.9
2016	151.0	-5.8	12.2	23.2
2017	155.6	3.0	3.4	-72.1
2018	174.9	12.4	5.9	73.5

*Estimates

SOURCE: ANNUAL REPORT AND IBISWORLD

Major Companies

Player Performance continued

Financial performance

Over the five years to 2018, industry-relevant revenue is anticipated to grow at an annualized rate of 8.5% to $174.9 million. Due to the company's breathing apparatuses being considered a core product, MSA has allocated a significant share of its resources and investments to enhance core product sales. During the five-year period, robust demand for respiratory devices from the fire service and industrial markets is expected to prompt industry-relevant revenue growth.

In particular, the development of the FireHawk M7 SCBA is expected to be a key driver for sales to the first responder markets. The unit meets the latest performance requirements adopted by the National Fire Protection Association and was the first device of its kind to be certified by the Safety Equipment Institute as National Fire Protection Association compliant for its breathing apparatus and personal alert safety system (PASS). The PASS device sounds an alarm when the wearer becomes disabled or lies motionless for 30 seconds.

Other Companies

The Respiratory Protection Equipment Manufacturing industry is highly concentrated, with the top three companies expected to comprise 92.1% of total revenue. While most of the industry's other companies account for less than 5.0% of industry revenue, many small respiratory protection equipment manufacturers have managed to develop a market niche. For example, small companies can cater to demand for respiratory equipment from local consumers that work with hazardous materials in the chemical and petrochemical sectors, among other sectors. Although industry operators that solely have foreign manufacturing faculties are excluded from the industry, many of these manufacturers still have prominent shares of the global respiratory protection equipment manufacturing market.

Player Performance

Johnson Controls
Market Share: 3.4%

Johnson Controls employs more than 57,000 people around the world and generated $31.4 billion in overall annual revenue in 2017 (latest data available). Under the company's fire protection segment, industry-relevant products include self-contained breathing apparatus and supplied-air and air-purifying respirators. These products are marketed under the Scott brand, with its primary customers including military forces and firefighters. In 2018, Johnson Controls is expected to generate an estimated $33.7 million in industry-relevant revenue.

Operating Conditions

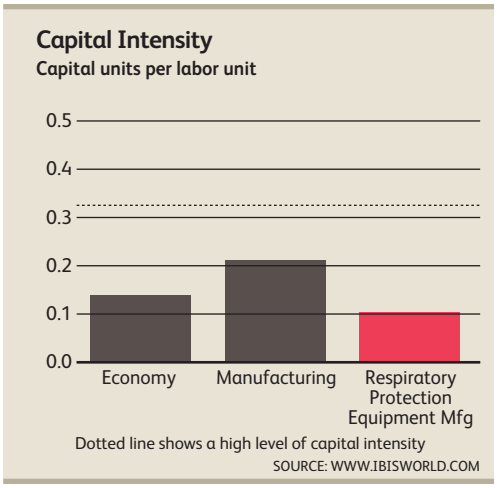
Capital Intensity | Technology & Systems | Revenue Volatility
Regulation & Policy | Industry Assistance

Capital Intensity

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

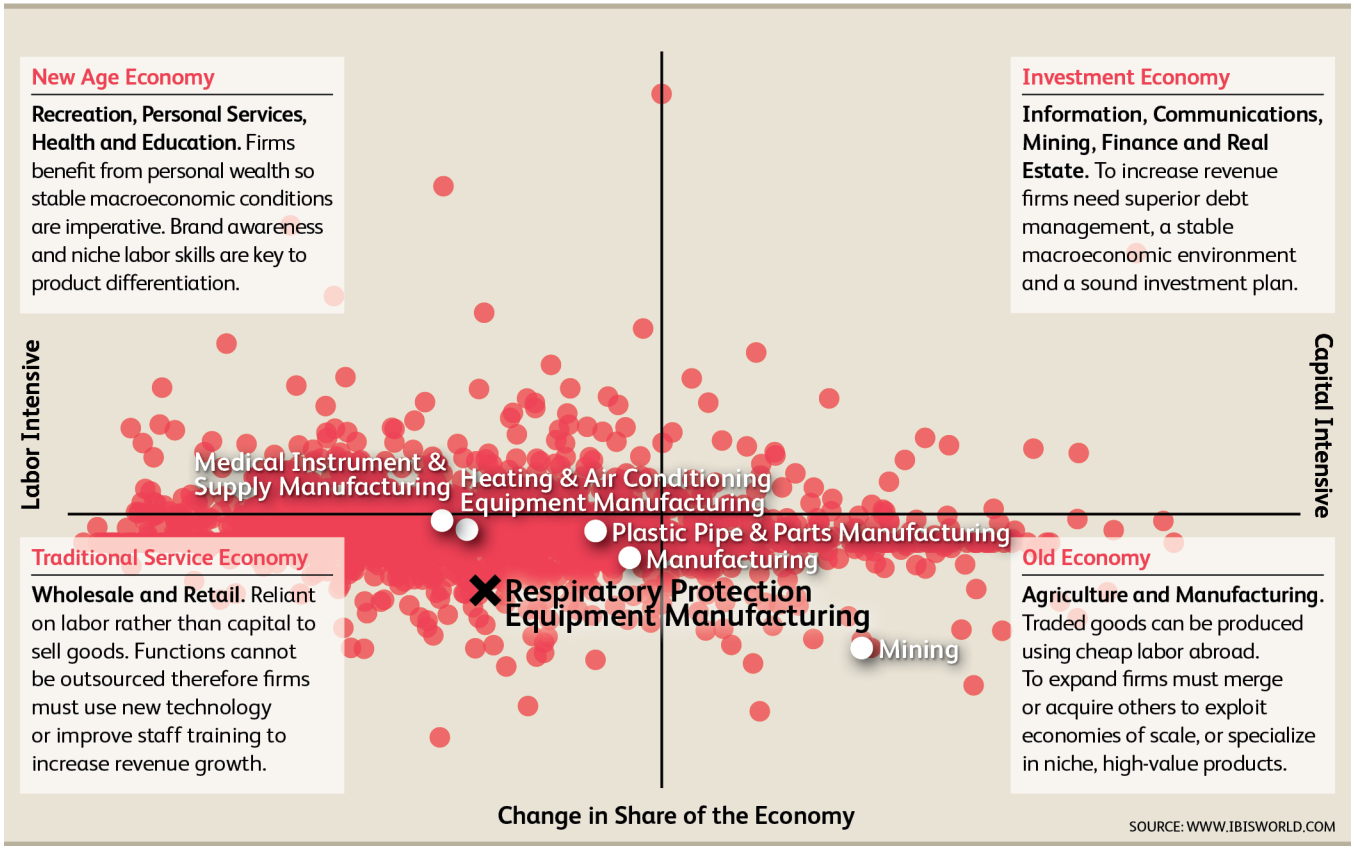
The Respiratory Protection Equipment Manufacturing industry exhibits low capital intensity. In 2018, for every dollar spent on labor, the industry incurs an estimated $0.11 in capital expenditures. Over the five years to 2018, the industry has become more capital intensive, thanks to manufacturers increasingly investing in research and development. For example, the use of up-to-date technology has been integral to product innovation for the industry. In particular, power air purifying respirator manufacturers have added alarms, flow controls and battery indicators to maintain constant air flow despite changing filter or battery conditions, thereby adding to capital costs.

Comparatively, wages are expected to account for 16.3% of industry revenue.



Many industry employees are highly specialized, with many employees needing to have knowledge of regulations

Tools of the Trade: Growth Strategies for Success



Operating Conditions

Capital Intensity continued

for respiratory devices, which may vary by downstream sector. For example, downstream markets that work with chemical, biological, radiological and nuclear agents, as well as aerospace sectors may have more specific needs for respiratory protection devices.

Technology and Systems

Level
The level of technology change is **Medium**

The majority of the Respiratory Protection Equipment Manufacturing industry's innovation is geared toward making products smaller, lighter and more efficient. For example, research that developed a new pressure-vessel technology for self-contained breathing apparatus (SCBA) was funded by the Department of Homeland Security's Science and Technology Directorate and built by major company Mine Safety Appliances. This technology is expected to replace the conventional single air cylinder breathing apparatus used by firefighters. Future technological additions to SCBA products that are being developed include physiological monitoring and physical tracking tools to protect workers by enabling other professionals to remotely monitor their vital signs and location.

Other recent technological improvements in respiratory protection equipment manufacturing are incremental. Examples include better filtration systems and materials. These innovations have enabled manufacturers to produce longer-lasting, more efficient products, without hurting the quality of their output. The advent of low-cost, yet more efficient, production line and palletizing technologies have sped up the process of manufacturing and packaging products. Over the five years to 2018, innovations in these areas and logistics have helped companies buoy their profitability.

Revenue Volatility

Level
The level of volatility is **Medium**

The Respiratory Protection Equipment Manufacturing industry is characterized by moderate revenue volatility. While many downstream markets are required to purchase respiratory protection equipment if their employees work in environments with insufficient oxygen or when in contact with harmful dusts, fogs, smokes, mists, fumes, gases, vapors or sprays, according to the Occupational Safety and Health Administration's respiratory protection standards, demand for industry products is still linked to business cycles. For example, if downstream markets (i.e. mining, military, manufacturing and construction sectors) consolidate, they may require fewer respiratory protection devices, thereby adding to industry revenue volatility.

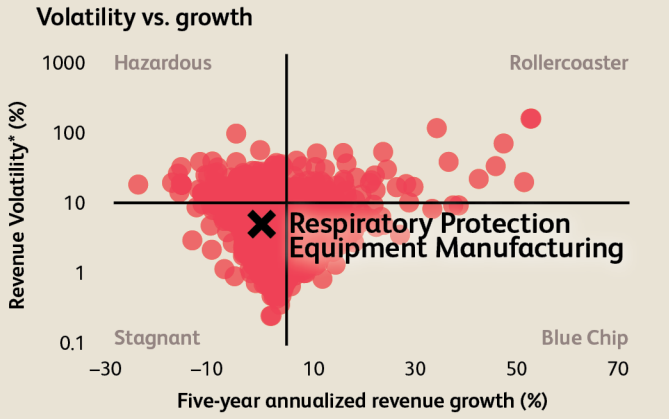
Other trends may add to the industry's revenue volatility. For example, many foreign manufacturers have inundated the domestic market with low-cost respiratory devices, namely dusk masks. As input commodity prices (i.e. plastic and resins) have exhibited some volatility, this trend has made it more high-cost for manufacturers to produce respiratory devices, due to strong price-based competition limiting the extent that producers could mark up prices and remain competitive, thus adding to revenue volatility over the past five years.

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 and Policy

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

The Respiratory Protection Equipment Manufacturing industry is subject to environmental laws and regulations, mainly enforced by the Environmental Protection Agency and similar state agencies that operate under best-practice precedents. These regulations primarily include proper air emissions, wastewater discharge, toxic substance and waste disposal monitoring and compliance. Environmental remediation costs must sometimes be paid retroactively for improper practices. The industry also files patents for intellectual property. As a result, patent laws apply to industry operators.

The industry's products are made to comply with several regulatory agencies that focus on worker safety and protection. These agencies include the Occupational Safety and Health Administration, Compressed Gas Association, American Society of Safety Engineers, American National Standards Institute, and the National Institute for Occupational Safety and Health. These organizations set and enforce standards, educate employees and conduct research to make recommendations for the prevention of work-related safety. These recommendations can influence demand for certain industry products, or they may encourage new product development to meet desired protection specifications. The majority of companies self-regulate to build a strong reputation for their proprietary brands because high safety and quality are important demand determinants for industry products.

Industry Assistance

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

Some regulatory measures can be considered assistance to the Respiratory Protection Equipment Manufacturing industry because workplace safety requirements make demand for industry products nondiscretionary since they protect workers in hazardous environments. Organizations like the National Institute for Occupational Safety and Health also conduct research and development that supports industry operations (see Regulation and Policy section). Other than regulatory measures, this industry does not receive much formal government assistance. Tariffs for breathing appliances and gas masks are free or nominal (2.5% of the value of shipments) for the majority of US trade partners.

Key Statistics

Industry Data

	Revenue ($m)	Industry Value Added ($m)	Establish-ments	Enter-prises	Employment	Exports ($m)	Imports ($m)	Wages ($m)	Domestic Demand	Industrial production index
2010	1,135.0	304.9	88	82	2,895	299.6	108.0	193.8	943.4	94.1
2011	1,089.1	276.9	90	84	2,725	344.2	128.8	184.3	873.7	97.1
2012	1,138.0	308.3	91	85	2,788	352.9	140.8	191.1	925.9	100.0
2013	1,176.4	290.3	94	88	2,738	343.3	133.5	192.7	966.6	102.0
2014	1,056.6	264.8	93	87	2,480	334.1	149.4	179.2	871.9	105.2
2015	1,003.0	241.3	91	86	2,257	331.9	164.1	158.1	835.2	104.1
2016	998.1	247.9	91	87	2,204	305.6	201.2	163.1	893.7	102.1
2017	985.1	227.3	92	87	2,184	335.3	211.8	161.3	861.6	103.7
2018	1,005.1	230.8	94	89	2,211	372.7	231.1	163.8	863.5	107.4
2019	1,037.3	238.3	96	91	2,256	391.4	226.1	168.1	872.0	110.1
2020	1,054.6	241.2	98	93	2,277	399.6	241.2	170.2	896.2	111.4
2021	1,056.6	241.9	98	93	2,266	411.1	242.8	169.6	888.3	112.6
2022	1,061.4	242.2	99	94	2,267	417.0	256.4	170.0	900.8	114.0
2023	1,066.4	243.6	100	95	2,266	431.5	262.7	170.1	897.6	115.4
2024	1,068.6	243.3	100	95	2,265	437.4	278.0	170.2	909.2	116.8

Annual Change

	Revenue (%)	Industry Value Added (%)	Establish-ments (%)	Enter-prises (%)	Employment (%)	Exports (%)	Imports (%)	Wages (%)	Domestic Demand (%)	Industrial production index (%)
2011	-4.0	-9.2	2.3	2.4	-5.9	14.9	19.3	-4.9	-7.4	3.2
2012	4.5	11.3	1.1	1.2	2.3	2.5	9.3	3.7	6.0	3.0
2013	3.4	-5.8	3.3	3.5	-1.8	-2.7	-5.2	0.8	4.4	2.0
2014	-10.2	-8.8	-1.1	-1.1	-9.4	-2.7	11.9	-7.0	-9.8	3.1
2015	-5.1	-8.9	-2.2	-1.1	-9.0	-0.7	9.8	-11.8	-4.2	-1.0
2016	-0.5	2.7	0.0	1.2	-2.3	-7.9	22.6	3.2	7.0	-1.9
2017	-1.3	-8.3	1.1	0.0	-0.9	9.7	5.3	-1.1	-3.6	1.6
2018	2.0	1.5	2.2	2.3	1.2	11.2	9.1	1.5	0.2	3.6
2019	3.2	3.2	2.1	2.2	2.0	5.0	-2.2	2.6	1.0	2.5
2020	1.7	1.2	2.1	2.2	0.9	2.1	6.7	1.2	2.8	1.2
2021	0.2	0.3	0.0	0.0	-0.5	2.9	0.7	-0.4	-0.9	1.1
2022	0.5	0.1	1.0	1.1	0.0	1.4	5.6	0.2	1.4	1.2
2023	0.5	0.6	1.0	1.1	0.0	3.5	2.5	0.1	-0.4	1.2
2024	0.2	-0.1	0.0	0.0	0.0	1.4	5.8	0.1	1.3	1.2

Key Ratios

	IVA/Revenue (%)	Imports/ Demand (%)	Exports/ Revenue (%)	Revenue per Employee ($'000)	Wages/Revenue (%)	Employees per Est.	Average Wage ($)	Share of the Economy (%)
2010	26.86	11.45	26.40	392.06	17.07	32.90	66,943.01	0.00
2011	25.42	14.74	31.60	399.67	16.92	30.28	67,633.03	0.00
2012	27.09	15.21	31.01	408.18	16.79	30.64	68,543.76	0.00
2013	24.68	13.81	29.18	429.66	16.38	29.13	70,379.84	0.00
2014	25.06	17.13	31.62	426.05	16.96	26.67	72,258.06	0.00
2015	24.06	19.65	33.09	444.40	15.76	24.80	70,048.74	0.00
2016	24.84	22.51	30.62	452.86	16.34	24.22	74,001.81	0.00
2017	23.07	24.58	34.04	451.05	16.37	23.74	73,855.31	0.00
2018	22.96	26.76	37.08	454.59	16.30	23.52	74,084.12	0.00
2019	22.97	25.93	37.73	459.80	16.21	23.50	74,512.41	0.00
2020	22.87	26.91	37.89	463.15	16.14	23.23	74,747.47	0.00
2021	22.89	27.33	38.91	466.28	16.05	23.12	74,845.54	0.00
2022	22.82	28.46	39.29	468.20	16.02	22.90	74,988.97	0.00
2023	22.84	29.27	40.46	470.61	15.95	22.66	75,066.20	0.00
2024	22.77	30.58	40.93	471.79	15.93	22.65	75,143.49	0.00

Figures are in inflation-adjusted 2018 dollars.

SOURCE: WWW.IBISWORLD.COM

Jargon & Glossary

Industry Jargon

CBRN DEFENSE (CBRND) The passive protection, avoidance and mitigation of chemical, biological, radiological and nuclear agents, such as through the use of respiratory protection equipment.

ELASTOMETRIC RESPIRATOR A rubberized device that uses removable filters, which are either disposable or washable, to filter air as the user breathes through the device.

PARTICULATE MATTER A complex mixture of extremely small particles and liquid droplets. Also known as particle pollution.

POWERED AIR-PURIFYING RESPIRATOR (PAPR) A device that takes contaminated air and filters it with a portable motor before supplying breathable air to the user.

SELF-CONTAINED BREATHING APPARATUS A device that provides a breathable air source that is carried by the user. Also known as a compressed air breathing apparatus (CABA).

SUPPLIED-AIR RESPIRATOR (SAR) A device that is connected to a fixed (nonportable) air supply.

IBISWorld Glossary

BARRIERS TO ENTRY High barriers to entry mean that new companies struggle to enter an industry, while low barriers mean it is easy for new companies to enter an industry.

CAPITAL INTENSITY Compares the amount of money spent on capital (plant, machinery and equipment) with that spent on labor. IBISWorld uses the ratio of depreciation to wages as a proxy for capital intensity. High capital intensity is more than $0.333 of capital to $1 of labor; medium is $0.125 to $0.333 of capital to $1 of labor; low is less than $0.125 of capital for every $1 of labor.

CONSTANT PRICES The dollar figures in the Key Statistics table, including forecasts, are adjusted for inflation using the current year (i.e. year published) 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 Spending on industry goods and services within the United States, regardless of their country of origin. It is derived by adding imports to industry revenue, and then subtracting exports.

EMPLOYMENT The number of permanent, part-time, temporary and seasonal employees, working proprietors, partners, managers and executives within the industry.

ENTERPRISE A division that is separately managed and keeps management accounts. Each enterprise consists of one or more establishments that are under common ownership or control.

ESTABLISHMENT The smallest type of accounting unit within an enterprise, an establishment is a single physical location where business is conducted or where services or industrial operations are performed. Multiple establishments under common control make up an enterprise.

EXPORTS Total value of industry goods and services sold by US companies to customers abroad.

IMPORTS Total value of industry goods and services brought in from foreign countries to be sold in the United States.

INDUSTRY CONCENTRATION An indicator of the dominance of the top four players in an industry. Concentration is considered high if the top players account for more than 70% of industry revenue. Medium is 40% to 70% of industry revenue. Low is less than 40%.

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

INDUSTRY VALUE ADDED (IVA) The market value of goods and services produced by the industry minus the cost of goods and services used in production. IVA is also described as the industry's contribution to GDP, or profit plus wages and depreciation.

INTERNATIONAL TRADE The level of international trade is determined by ratios of exports to revenue and imports to domestic demand. For exports/revenue: low is less than 5%, medium is 5% to 20%, and high is more than 20%. Imports/domestic demand: low is less than 5%, medium is 5% to 35%, and high is more than 35%.

LIFE CYCLE All industries go through periods of growth, maturity and decline. IBISWorld determines an industry's life cycle by considering its growth rate (measured by IVA) compared with GDP; the growth rate of the number of establishments; the amount of change the industry's products are undergoing; the rate of technological change; and the level of customer acceptance of industry products and services.

Jargon & Glossary

IBISWorld Glossary continued

NONEMPLOYING ESTABLISHMENT Businesses with no paid employment or payroll, also known as nonemployers. These are mostly set up by self-employed individuals.

PROFIT IBISWorld uses earnings before interest and tax (EBIT) as an indicator of a company's profitability. It is calculated as revenue minus expenses, excluding interest and tax.

VOLATILITY The level of volatility is determined by averaging the absolute change in revenue in each of the past five years. Volatility levels: very high is more than ±20%; high volatility is ±10% to ±20%; moderate volatility is ±3% to ±10%; and low volatility is less than ±3%.

WAGES The gross total wages and salaries of all employees in the industry. The cost of benefits is also included in this figure.

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