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Clean sweep: Rising healthcare expenditure is expected to prompt demand for industry services

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IBISWorld Industry Report OD5374

Ultrasonic Cleaning Equipment Manufacturing

June 2019

Jeremy Moses

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About this Industry

Industry Definition

The Ultrasonic Cleaning Equipment Manufacturing industry includes companies that domestically manufacture ultrasonic cleaners. An ultrasonic cleaner is a cleaning device that uses ultrasound and an appropriate cleaning solvent to clean delicate items. These items include medical and dental instruments and a variety of devices used in the industrial sector.

Main Activities

The primary activities of this industry are

Manufacturing high capacity ultrasonic cleaners

Manufacturing medium capacity ultrasonic cleaners

Manufacturing low capacity ultrasonic cleaners

The major products and services in this industry are

High-capacity ultrasonic cleaners

Low-capacity ultrasonic cleaners

Medium-capacity ultrasonic cleaners

Similar Industries

31-33 Manufacturing in the US

This industry includes establishments engaged in the transformation of raw inputs into new products using mechanical, physical or chemical processes.

33451b Medical Device Manufacturing in the US

This industry includes manufacturers of electromedical and electrotherapeutic apparatus, such as magnetic resonance imaging equipment, ultrasound equipment and electromedical endoscopic equipment.

33911a Medical Instrument & Supply Manufacturing in the US

This industry primarily produces medical, surgical, ophthalmic and veterinary instruments and apparatus, such as syringes, anesthesia apparatus, surgical clamps and medical thermometers.

42345 Medical Supplies Wholesaling in the US

This industry wholesales stores and delivers medical and surgical equipment, instruments and supplies to medical and dental practitioners, clinics and hospitals.

Additional Resources

For additional information on this industry

www.cdc.gov
Centers for Disease Control and Prevention

www.census.gov
US Census Bureau

www.usitc.gov
US International Trade Commission

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Industry at a Glance

Ultrasonic Cleaning Equipment Manufacturing in 2019

Key Statistics Snapshot

Revenue
$542.1m

Annual Growth 14–19
3.3%

Annual Growth 19–24
1.5%

Profit
$26.0m

Exports
$9.5m

Businesses
26

Market Share

L&R Manufacturing Company
11.6%

Blue Wave Ultrasonics Inc.
8.1%

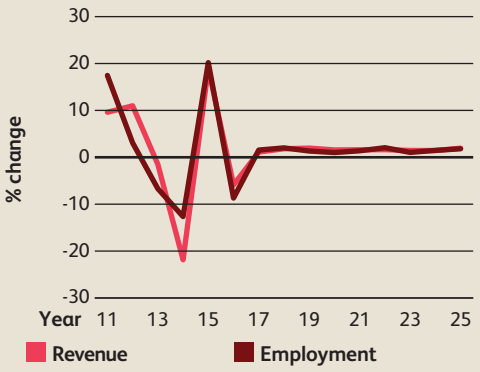
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Key External Drivers

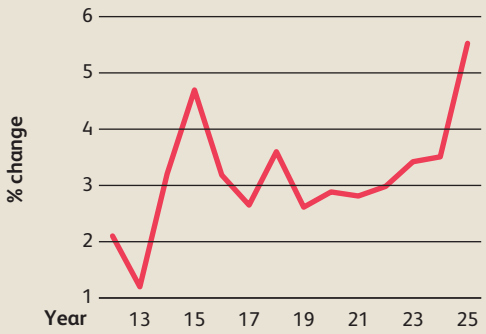
- Total health expenditure
- Number of physician visits
- Industrial production index
- Demand from dentists
- Trade-weighted index
- World price of steel

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Revenue vs. employment growth

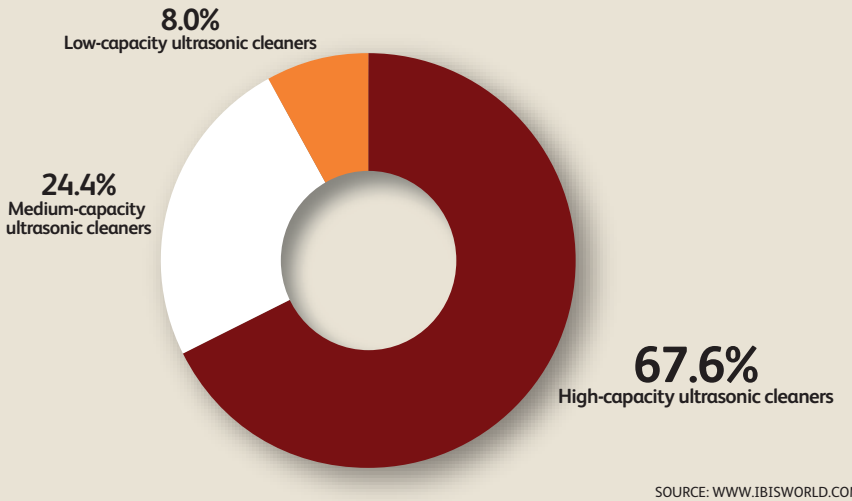


Total health expenditure



SOURCE: WWW.IBISWORLD.COM

Products and services segmentation (2019)



SOURCE: WWW.IBISWORLD.COM

Industry Structure

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

FOR ADDITIONAL STATISTICS AND TIME SERIES SEE THE APPENDIX ON PAGE 30

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Industry Performance

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

Executive Summary

The Ultrasonic Cleaning Equipment Manufacturing industry produces devices that use solvent and high-frequency sound to remove surface contaminants from a variety of items. Ultrasonic cleaning is the preferred cleaning method for medical, dental, ophthalmic and veterinary offices. As a result, these care providers make up a significant portion of the market for industry products. Industrial customers also use ultrasonic cleaning to remove grease and other debris from products and operational services, and retailers purchase cleaning equipment to provide additional services to their customers. As a result, industry revenue is highly susceptible to shifts in consumer demand, demand for healthcare services and industrial production.

Industry revenue is highly susceptible to shifts in consumer demand, demand for healthcare services and industrial production

Over the five years to 2019, the implementation of the Patient Protection and Affordable Care Act has increased demand for medical care in the United States, bolstering demand for ultrasound devices used to clean medical instruments. As a result, industry revenue is expected to increase at an annualized rate of 3.3% to $542.1 million. However, declines in the industrial production index early in the period tempered industry growth somewhat. Industry revenue is expected to rise 2.0% in 2019, bolstered by an anticipated 2.6% increase in total health expenditure and a 2.3% boost in the industrial production index in that same year. Exports have fallen while imports have risen as a result of the appreciation of the US dollar over the five years to 2019. Additionally, profit has declined due to volatility in steel prices.

Over the next five years, IBISWorld expects demand from export customers to pick up. As many overseas economies are forecast to improve, foreign consumers are expected have more access to healthcare. Additionally, the US dollar is expected to depreciate over the five years to 2024, boosting the competitiveness of industry exports in foreign markets. Exports are anticipated to increase at an annualized rate of 1.4% during the outlook period, a reversal of course from the current period. Meanwhile, US industrial production activity is also expected to continue to grow, and the steadily aging national population will stimulate demand for healthcare services. As a result of these factors, industry revenue is expected to rise an annualized 1.5% during the outlook period to total $585.1 million.

Key External Drivers

Total health expenditure

Total health expenditure in the United States includes public and private spending on activities aimed at promoting health and preventing disease. Rising health expenditure drives increased medical and surgical instrument usage. This, in turn, stimulates industry demand and revenue. Total health expenditure is expected to increase in 2019, presenting a potential opportunity for the industry.

Number of physician visits

The number of physician visits has a direct effect on industry revenue. When demand for medical services from physicians rises, physicians' offices and hospitals will likely purchase more medical equipment to meet rising demand, which will in

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Industry Performance

Key External Drivers continued

turn generate greater demand for the ultrasonic cleaning equipment required to maintain these instruments. The total number of physician visits made in the United States is expected to increase in 2019.

Industrial production index

The industrial production index (IPI) measures the level of activity in the mining, manufacturing, gas and electricity production industries in the United States. These industries use ultrasonic cleaning equipment to clean their production facilities. As a result, the level of industrial activity is directly correlated with demand for industry products. The IPI is expected to increase in 2019.

Demand from dentists

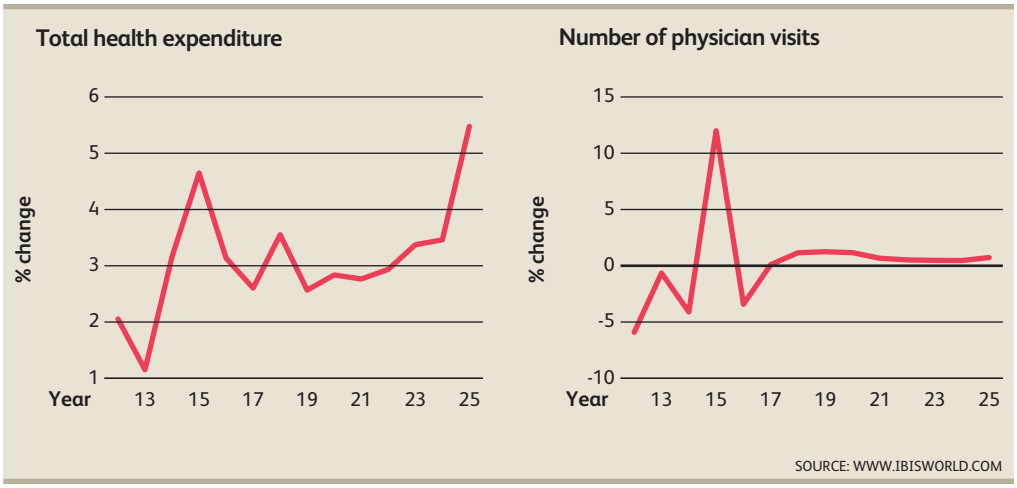
Dentistry practices are a prominent source of demand for ultrasonic cleaning devices. Ultrasonic cleaning is the primary method used for cleaning instruments. Furthermore, ultrasonic cleaners are increasingly being recommended to patients for cleaning crowns and dentures. Demand from dentists is expected to increase in 2019.

Trade-weighted index

The trade-weighted index measures the strength of the US dollar relative to the currencies of its trading partners. When the value of the US dollar declines, exports become comparatively less expensive for foreign counties and imports become comparatively more expensive for US consumers, which benefits the domestic Ultrasonic Cleaning Equipment Manufacturing industry. Conversely, when the US dollar appreciates, industry exports become comparatively more expensive in the global market and there is greater price-based competition from industry imports. The trade-weighted index is expected to increase in 2019.

World price of steel

Steel is a primary input used in manufacturing ultrasonic cleaning devices. As a result, when the price of steel rises, operators experience increased costs. Operators can respond to these increased costs by raising selling prices, which increases industry revenue. The world price of steel is expected to decline in 2019, representing a potential threat to this industry.



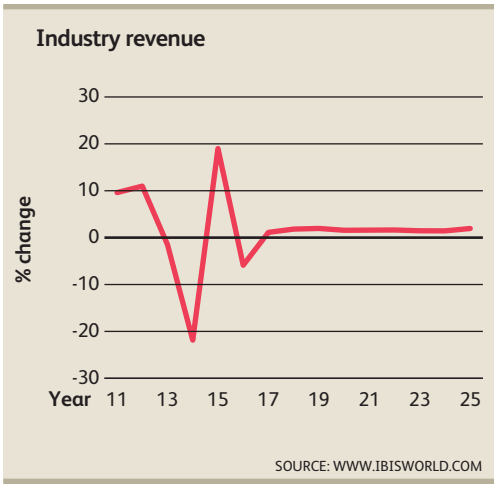
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Industry Performance

Current Performance

The Ultrasonic Cleaning Equipment Manufacturing industry is expected to increase at an annualized rate of 3.3% over the five years to 2019 to total $542.1 million in revenue. The industry includes manufacturers that primarily produce these devices for medical and dental applications and producers of ultrasonic devices used to clean other items, including industrial parts, jewelry and other consumer-use products. As a result, the industry is heavily dependent on demand for healthcare services, industrial demand and consumer demand. While the industry experienced declines in 2014 and 2016, owing to lagging industrial demand early in the period, strong demand from healthcare services providers has fueled overall revenue growth, including growth of 2.0% in 2019.



Industry operations

Ultrasonic devices use high-frequency sound waves, which pass through a liquid and remove surface contaminants in a process known as cavitation. Typically, commercial ultrasonic cleaning equipment uses a frequency between 20 and 80 kHz, with 40 kHz being the common frequency. Increasing frequency typically enables more efficient cleaning for more intricate surfaces. Ultrasonic methods are particularly useful for cleaning crevices within devices and, according to major industry player L&R Manufacturing Company, are 16 times more efficient than manual cleaning. Furthermore, ultrasonic cleaning minimizes the likelihood of puncture wounds during manual cleaning. As a result, ultrasonic cleaning devices have been widely adopted in medical and dentistry practices to guarantee proper cleaning for surgical and dental instruments.

The industry is relatively small given its niche product offerings, although it has grown slightly amid increasing demand. During the period, the number of enterprises increased at an annualized rate of 4.4% to 26 operators. In line with this trend, industry employment has increased at an annualized rate of 2.9% to 1,289 employees. However, the average industry profit margin is expected to reach 4.8% in 2019, declining from 6.6% in 2014 due to volatile steel prices and the impact of an excise tax on medical device manufacturers, enacted as a part of the Affordable Care Act.

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Industry Performance

Strong healthcare demand, mixed industrial demand

Demand for ultrasonic cleaning equipment largely depends on wider trends within the US industrial and healthcare sectors. As these downstream industries increase their total level of production, demand for ultrasonic cleaners used in their industrial processes also increases. Moreover, growth in manufacturing industries (included in the industrial production index (IPI)) indicates greater demand for consumer products. As demand for consumer products increases, retailers that sell products that can be cleaned using ultrasonic methods (such as golf clubs or window blinds) will be more likely to buy industry cleaners to offer their customers additional services. Consumers themselves will also be more likely to purchase home-use cleansers as overall demand for manufactured goods rises. The IPI, which measures the output of mining, manufacturing, gas and electric industries in the United States, is expected to grow at a relatively sluggish annualized rate of 1.1% over the five years to 2019, declining in some years. While expanding overall, declines in 2015 and 2016 hurt industry revenue during the early half of the current period.

Meanwhile, according to data from the Centers for Medicare and Medicaid Services' (CMS), National Health Expenditure Accounts (NHEA) and IBISWorld estimates, total health expenditure is anticipated to increase at an annualized rate of 3.3% over the five years to 2019, representing a boon to the industry. Total health expenditure has consistently increased during the period due to rising per capita disposable income, mounting prevalence of chronic diseases, the gradual aging of the US population and expanded access to healthcare coverage under the Patient Protection and Affordable Care Act. All of these factors have encouraged Americans to spend more on healthcare, which drives medical and surgical instrument usage. This increased instrument usage, in turn, stimulates industry demand and revenue, because surgical and medical devices and instruments must be thoroughly cleaned after every use.

Total health expenditure is anticipated to increase, representing a boon to the industry

The industry has been positively affected by widening usage of ultrasonic devices in dentistry practices. Most dental practices use ultrasonic devices to clean instruments prior to sterilization. Ultrasonic cleaners are also increasingly being recommended to patients for cleaning dentures and crowns at home. Furthermore, dentists also increasingly use ultrasonic scalers to remove plaque during teeth cleaning, given that they can be more effective at removing plaque and are generally faster than traditional methods.

Global industry

Imported ultrasonic cleaning devices account for an estimated 8.2% of domestic demand, based on the latest data from the United States International Trade Commission (USITC). Over the past five years, the total value of imported industry products has increased at an annualized rate of 3.9% to $47.3 million. While the rising value of the US dollar has supported imports, as the currency's appreciation has made foreign products more affordable in the US market, the highly regulated nature of industry products keeps foreign imports at a relatively low percentage of overall domestic demand.

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Industry Performance

Global industry continued

Overall, Malaysia, Canada and China are the largest sources of imported ultrasonic cleaning devices for the US market. For example, Crest Ultrasonics Corporation, one of the largest global ultrasonic cleaning equipment manufacturers, produces ultrasonic cleaning devices from its facility in Penang, Malaysia and imports these products to the US market.

Industry exports have decreased over the past five years, largely due to the appreciating dollar rendering US-made products relatively more expensive in overseas markets. According to the USITC, the top export destinations for US industry products are Mexico, Ireland, Taiwan and China. Many of these markets have experienced faltering industrial production in recent years, limiting demand for ultrasonic cleaning equipment. IBISWorld expects the total value of industry exports to fall at an annualized rate of 9.2% over the five years to 2019 to total $9.5 million.

Industry Outlook

Over the five years to 2024, the Ultrasonic Cleaning Equipment Manufacturing industry is forecast to continue its growth from the previous period. Overall, IBISWorld expects industry revenue to rise at an annualized rate of 1.5% during the outlook period to total $585.1 million. The industry will benefit from positive trends in US healthcare spending and industrial activity, which will drive greater investment in devices used for cleaning medical and surgical equipment, including industrial parts and devices. Moreover, growth in international markets is expected to positively affect the share of revenue derived from exports over the next five years, further benefiting industry growth. During this five-year period, industry manufacturers are expected to increasingly focus on developing ultrasonic cleaning devices capable of recycling solvents and providing ultrasonic cleaners capable of varying their frequencies to clean a greater range of devices.

Demand and landscape

Over the next five years, the industry is expected to benefit from a continuation of rising healthcare expenditure, which will increase demand for medical devices and thereby drive demand for cleaning devices. Ultrasonic cleaners are the dominant method recommended by medical device manufacturers for cleaning surgical and medical instruments, and IBISWorld expects the Medical Instrument and Supply Manufacturing industry (IBISWorld report 33911a) to grow at an annualized rate of 1.2% over the next five years. The aging population is expected to have the most significant effect on demand for medical supplies and instruments, pushing up overall public and private health expenditure. Over the five years to 2024, the number of US residents aged 65 and older is expected to increase at an annualized rate of 3.2%. In comparison, the total US population is forecast to grow at an annualized rate of 0.7% during the same period. This trend indicates that people aged 65 and older

Consolidation is not expected to keep up with overall industry enterprise growth

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Industry Performance

Demand and landscape continued

will constitute an increasingly significant proportion of the population. Since the elderly generally require more healthcare than younger people, this demographic shift will likely support demand for industry products required for cleaning medical and dental instruments.

IBISWorld expects industry participation to increase over the next five years, with the total number of enterprises rising an annualized 1.5% to 28 companies and employment increasing an annualized 1.4% to 1,381 people. New operators are expected to enter the industry due to strong industry revenue growth. While the largest companies are also likely to consolidate as larger companies acquire smaller producers and their innovative new cleaning solutions to gain market share, such consolidation is not expected to keep up with the overall industry enterprise growth. However, industry manufacturers will have to contend with the rising price of steel, a key input in many industry products. Over the next five years, the price of steel is expected to rise at an annualized rate of 1.3%. The forecast rise in the price of steel is anticipated to raise industry purchase costs, limiting industry profit growth during the period.

Trade conditions

The industry operates with a trade deficit, with the value of total imports outweighing exports by $37.8 million in 2019. This trade gap is expected to decline over the five years to 2024, as imports decline while exports increase, fueled by a depreciation in the US dollar. According to IBISWorld estimates, industry imports are expected to decline at an annualized rate of 1.9% over the next five years to total $42.9 million.

At the same time, industry exports are forecast rise at an annualized rate of 1.4% to reach $10.2 million. The industry's largest export markets are currently Mexico, Ireland, Taiwan and China, according to data from the US International Trade Commission. Over the next five years, increased industrial activity in those countries will likely support demand for industrial cleaning products. Additionally, improved economic conditions in these countries are expected to boost per capita disposable income and increase access to healthcare, raising foreign demand for medical and surgical cleaning equipment during the period. Furthermore, the anticipated US dollar depreciation over the next five years is expected to improve export competitiveness in global markets, resulting in export gains over the five years to 2024.

Industry exports are forecast to outpace growth in imports

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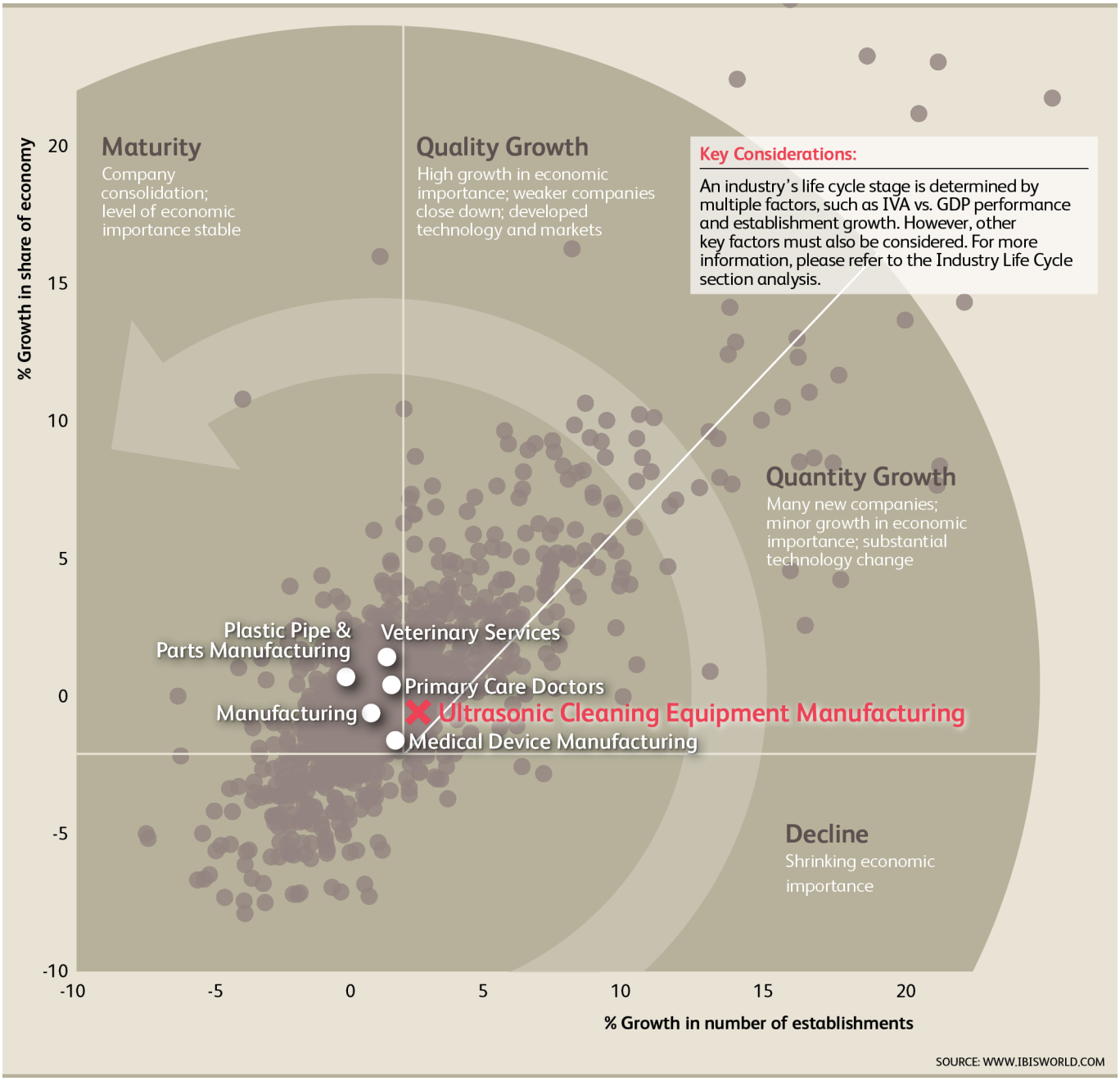
Industry Performance

Life Cycle Stage

Industry value added is forecast to grow more slowly than the US economy

Technological innovation drives new product development but does not create new markets

The number of industry establishments is expected to remain relatively stable over the 10 years to 2024



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Industry Performance

Industry Life Cycle

This industry is **Mature**

The Ultrasonic Cleaning Equipment Manufacturing industry is in the mature stage of its life cycle. Over the 10 years to 2024, industry value added (IVA), which measures the industry's contribution to the economy, is projected to rise at an annualized rate of 1.6%. Comparatively, US GDP is expected to expand 2.0% during the same 10-year period; while GDP growth above growth of the industry typically is characteristic of a declining industry, the industry is subject to a high level of volatility as a result of its dependence on the US healthcare and industrial sectors, limiting IVA growth during the period.

Although initially developed in the 1950s, widespread usage of ultrasonic cleaners began 20 years ago, following increased environmental regulation of chlorofluorocarbons, solvents previously used for cleaning. This prompted greater usage of water-based cleaning solutions such as ultrasonic cleaning systems. As a result, industry products have been widely accepted in most markets for years.

Although this industry is mature, continued technological innovation of ultrasonic cleaners has provided some growth opportunities over the past 10 years. In particular, industry manufacturers have introduced devices that vary the frequency that the ultrasonic cleaner generates to create a more uniform cleaning for devices and the ability to clean dissimilar parts within one system. Furthermore, industry manufacturers have also introduced products that recycle hydrocarbon cleaning fluids, enabling the solvent to be re-used multiple times to minimize waste. However, these innovations largely represent new product development rather than the expansion of the industry into heretofore-untapped markets.

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Products & Markets

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

Supply Chain

KEY BUYING INDUSTRIES

54194 **Veterinary Services in the US**
This industry demands ultrasonic cleaning equipment for veterinary practitioners primarily engaged in the practice of medical, dental or surgical treatment for animals.

62111a **Primary Care Doctors in the US**
This industry demands ultrasonic cleaning products for use with orthopedic devices, prosthetic appliances, dressings, crutches, gauze, surgical sutures, syringes, hypodermic needles and medical thermometers.

62111b **Specialist Doctors in the US**
This industry demands ultrasonic cleaning products for orthopedic devices, prosthetic appliances, dressings, crutches, gauze, surgical sutures, syringes, hypodermic needles and medical thermometers.

62121 **Dentists in the US**
This industry demands ultrasonic cleaning equipment for dental instruments, dental impression material, crowns, dentures and orthodontic appliances.

62211 **Hospitals in the US**
This industry demands ultrasonic cleaning equipment for syringes, hypodermic needles, anesthesia apparatus, blood transfusion equipment, catheters, surgical clamps and medical thermometers.

99 **Consumers in the US**
Consumers demand ultrasonic cleaning equipment for use in routine maintenance of medical and dental devices for home use.

KEY SELLING INDUSTRIES

32612 **Plastic Pipe & Parts Manufacturing in the US**
This industry supplies plastic profile shapes, such as tubing to manufacture ultrasonic cleaning equipment.

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

33531 **Electrical Equipment Manufacturing in the US**
This industry supplies electrical appliances used in the manufacturing of ultrasonic cleaning equipment.

Products and Services

Ultrasonic cleaning equipment can be used on most hard, nonabsorbent materials such as metal and plastic that are not affected by chemical cleaning fluids. The Ultrasonic Cleaning Equipment Manufacturing industry makes a variety of ultrasonic cleaners in multiple sizes that can be used for medical equipment and other machinery or delicate items that require cleaning. Ultrasonic cleaning is ideal for removing small particles from inaccessible areas and can speed up the cleaning operations that would require a significant amount of time and labor.

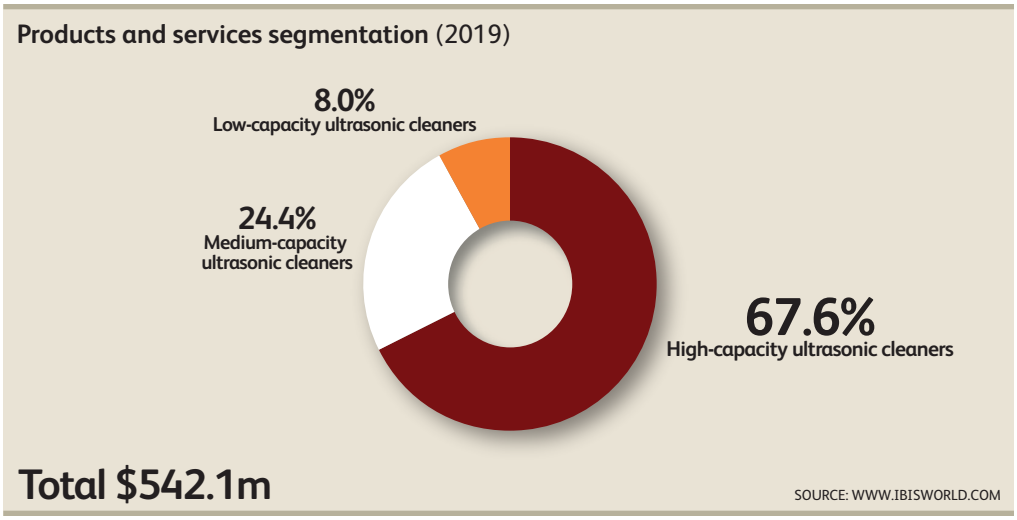
High-capacity ultrasonic cleaners

Medical and dental industries use high-capacity ultrasonic cleaners to decontaminate and maintain a high volume of instruments and tools. Ultrasonic cleaners are used on medical equipment in combination with other methods of sterilization. Medical and dental ultrasonic cleaners thoroughly clean medical parts and appliances for

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Products & Markets

Products and Services continued



use with patients. After sterilization of medical or dental devices, ultrasonic cleaning is used as a separate step to further remove contamination. Medical ultrasonic cleaners come in a variety of sizes to use in sterilizing small surgical instruments and larger medical diagnostic machinery. Hospitals and laboratories generally use high capacity ultrasonic cleaners designed for medium and heavy-duty applications due to the high volume of instruments that require cleaning on a daily basis.

High-capacity ultrasonic cleaners used for dental services are used to clean a high volume of picks, scrapers, carvers, spatulas, needles and other equipment that is used for dental work. Ultrasonic cleaners are used in conjunction with sterilization methods to remove contaminants from dental devices. This segment has grown over the past five years as ultrasonic cleaners reduce the need for manual cleaning, thus reducing the cost of wages spent on dental assistants. In 2019, high-capacity ultrasonic cleaners are expected to account for 67.6% of industry revenue.

Medium-capacity ultrasonic cleaners

Medium-capacity ultrasonic cleaners are used with industries that less frequently require cleaning and decontamination of instruments. Certain ultrasonic cleaning equipment is specialized for ophthalmologists and opticians for the cleaning of optical components. Generally, ophthalmologists use low to medium capacity ultrasonic cleaners due to the lower frequency and use of instruments that need sterilization and decontamination. In 2019, medium-capacity ultrasonic cleaners are expected to account for 24.4% of industry revenue.

Low-capacity ultrasonic cleaners

Low-capacity ultrasonic cleaners are for individual use with small-sized objects. Most commonly, household sized ultrasonic cleaners can be used for delicate dental related items such as dentures or optical lenses. As a result, they are primarily purchased by dental offices for cleaning specialized and delicate equipment. In 2019, they are expected to account for 8.0% of industry revenue.

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Products & Markets

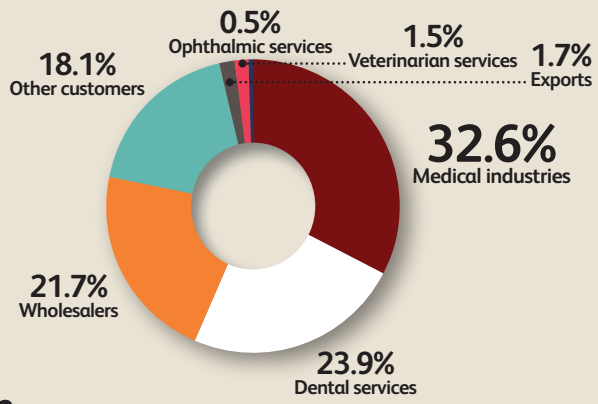
Demand Determinants

Demand for the Ultrasonic Cleaning Equipment Manufacturing industry is influenced by the level of demand from major markets and macroeconomic factors. For medical and dental practices, demand from dentists and the number of physician visits heavily affects demand of ultrasonic cleaning equipment associated with medical instruments.

Total health expenditure has a significant impact on the industry. The number of physician visits (which is itself closely linked to the country's overall economic climate) also has a direct effect on industry revenue. A rise in private and public health insurance coverage will make physician visits more frequent, thus forcing medical professionals to use cleaning equipment on medical devices. Similarly, the age and health of the population of consumers drives demand for industry products. Older individuals generally seek more medical care, so as individuals over the age of 65 make up an increasingly larger portion of the overall US population, the use of ultrasonic cleaning equipment (and, in turn, industry demand) will increase, as more consumers seek out medical services for the treatment of illness.

Major Markets

Major market segmentation (2019)



Total $542.1m

SOURCE: WWW.IBISWORLD.COM

Medical services

In hospitals and clinics, ultrasonic equipment is used to clean surgical instruments. Surgical tools are sterilized and cleaned with ultrasonic surgical cleaning equipment to remove blood, tissue, saliva and other debris. This segment's share of total Ultrasonic Cleaning Equipment Manufacturing industry revenue has increased over the five years to 2019 as demand for medical services picked up in the wake of the Patient Protection and Affordable Care Act's expansion of healthcare coverage. In 2019, medical services are expected to account for 32.6% of industry revenue.

Dental services

Dental devices such as picks, scrapers, carvers, spatulas, teasing needles and other related equipment must be sterilized after each use. Ultrasonic cleaners are used after the sterilization process as a separate step and ensure the safety and cleanliness of dental instruments. Also, ultrasonic cleaners enable dentists and assistants to avoid hand cleaning which can prevent

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Products & Markets

Major Markets continued

potential complications from puncture wounds from sharp contaminated instruments. In 2019, dental services are expected to account for 23.9% of industry revenue.

Wholesalers

Wholesalers of cleaning equipment for medical, dental, ophthalmic and related markets are one of the largest markets for industry products. Larger organizations, such as hospitals and large-scale clinics, often chose to buy industry products in bulk from wholesalers, rather than purchasing directly from manufacturers or retailers. Additionally, these wholesalers often have established relationships with buyers in downstream industries. In 2019, wholesalers are expected to account for 21.7% of industry revenue.

Ophthalmic services

Ophthalmologists, opticians and their patients use optical lens ultrasonic cleaning equipment to clean eyeglasses, contact lenses and professional optical components. Optical ultrasonic cleaning equipment is used for small devices that require specialized ultrasonic cleaning solutions specific to the instrument. Demand for ophthalmic services is primarily dependent on disposable income, which has increased since 2014, expanding this segment's share of total industry revenue. In 2019, ophthalmic services are expected to account for 0.5% of industry revenue.

Veterinarian services

Veterinarians use ultrasonic cleaners for all surgical and dental tools used with animals. These tools help veterinarians with improved infection control and productivity in veterinary clinics. Using ultrasonic cleaning machines helps enhance the condition of instruments in both appearance and functionality and eliminates the need for hand cleaning. In 2019, veterinarians are expected to account for 1.5% of industry revenue.

Other customers

Other customers include retailers, which purchase ultrasonic cleaning equipment to provide cleaning services for the products they sell, such as golf clubs or window blinds. This segment also includes industrial customers, who use ultrasonic cleaning equipment to clean and sanitize factory surfaces and other operational environments. Industrial customers may buy pre-designed ultrasonic cleaners or request custom solutions from industry producers. Ultrasonic cleaners are often used by industrial producers who do not wish to dismantle their operational systems before cleaning. This segment's share of total industry revenue has increased slightly in recent years, as industrial activity in the United States has increased. In 2019, other customers are expected to account for 18.1% of industry revenue.

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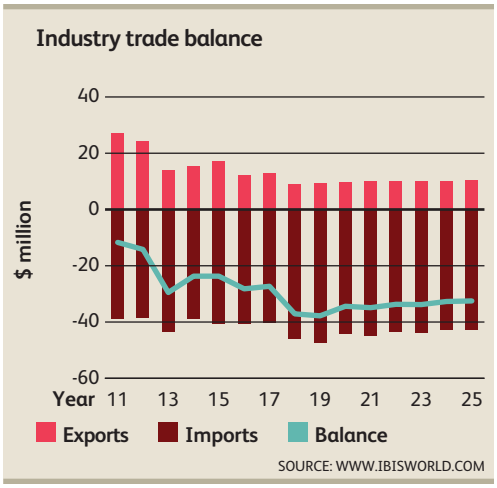
Products & Markets

International Trade

Level & Trend
Exports in the industry are **Low** and **Decreasing**

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

International trade within the Ultrasonic Cleaning Equipment Manufacturing industry is highly volatile. Demand for industry products fluctuates year-to-year both in the US market and overseas because industry products are expensive and represent significant capital expenditure for customers. Moreover, exchange rates contribute to volatility international trade as currency fluctuations can render already-expensive ultrasonic cleaning devices prohibitively costly under certain international conditions.



Imports

Over the five years to 2019, industry imports are expected to increase at an annualized rate of 3.9% to total $47.3 million. The industry imports the most ultrasonic cleaning devices from Malaysia, Canada, China and Mexico. Ultrasonic cleaning equipment manufacturing is increasingly moving to low-cost production centers in areas such as China and Malaysia to take advantage of lower wage costs and proximity to other relevant manufacturing facilities. However, as industry products are highly regulated and imports are subject to the same regulations as domestically produced goods, it is often easier for end users of ultrasonic cleaning equipment to source industry products from domestic manufacturers to avoid any issues with regulation compliance. As a result, industry imports only satisfy a small proportion of domestic demand. In 2019, they are expected to account for 8.2% of total industry revenue in 2019.

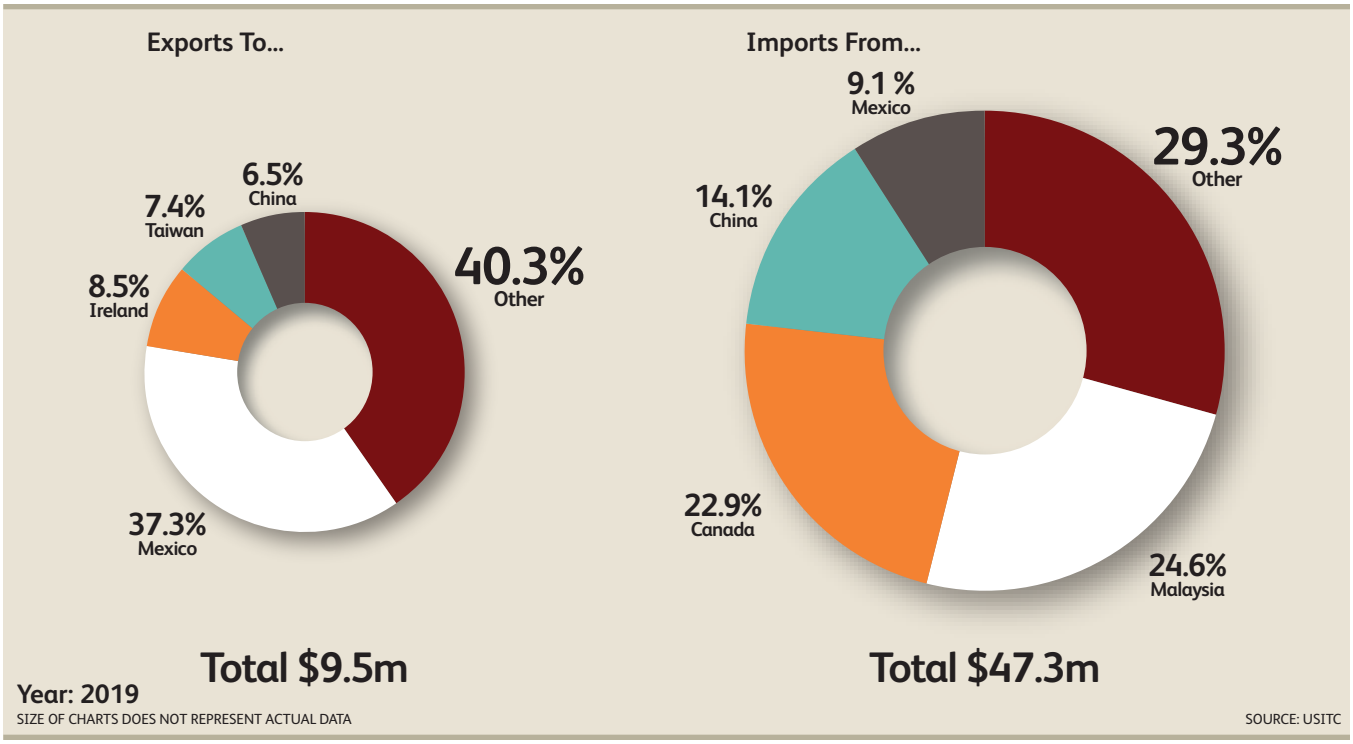
Exports

Industry exports are expected to fall at an annualized rate of 9.2% over the five years to 2019 to total $9.5 million. The industry's four largest export destinations are Mexico, Ireland, Taiwan and China. Demand in these countries is increasing as their economies grow and more consumers have access to healthcare. However, demand for exports have been stifled by the trade-weighted index, which measures the strength of the US dollar relative to the currencies of its trading partners, increasing significantly over the bulk of the period. The strong appreciation of the US dollar has made industry exports less affordable to foreign consumers, decreasing their competitiveness in foreign markets. Consequently, although demand for industry products is increasing in emerging market economies, such demand is increasingly satisfied by more affordable goods manufactured outside of the United States. Exports are forecast to rise during the outlook period as foreign consumers have more access to healthcare and disposable income, global economic conditions improve and the US dollar experiences an anticipated depreciation relative to other major currencies.

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Products & Markets

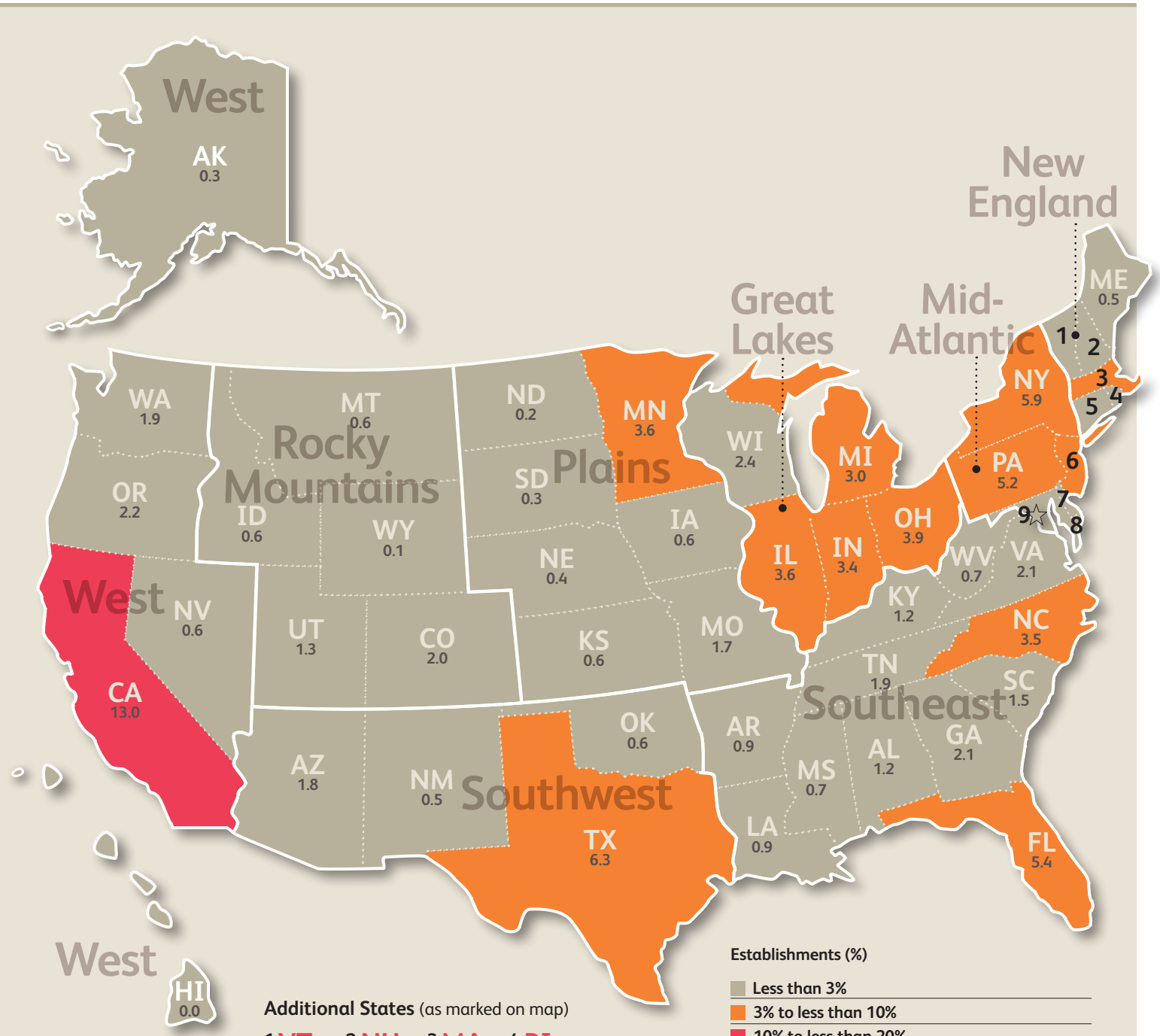
International Trade continued



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Products & Markets

Business Locations 2019



SOURCE: WWW.IBISWORLD.COM

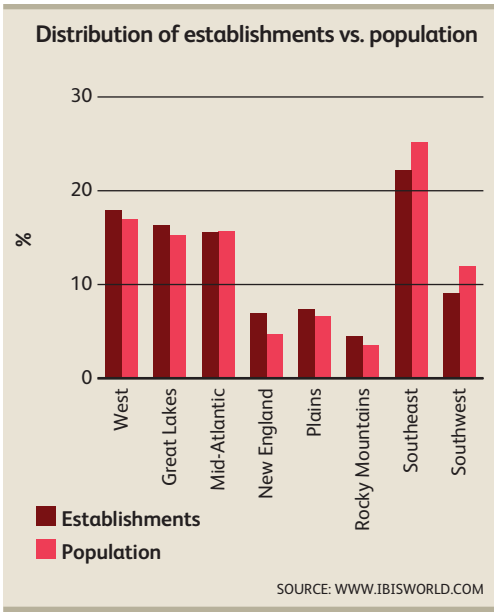
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Products & Markets

Business Locations

Ultrasonic Cleaning Equipment Manufacturing industry locations are concentrated in the Southeast (22.2% of establishments), West (17.9%), Great Lakes (16.3%) and Mid-Atlantic (15.6%) regions of the country. California alone accounts for an expected 12.9% of establishments due to the 400 community hospitals operating 74,000 beds with more than reported 3.5 million admissions in the state. Similarly, according to US Census Bureau data, Florida, which holds 5.4% of establishments, has more than 200 community hospitals with more than 200,000 full-time equivalent personnel.

Population size and age distribution largely influence the location of industry operators in the Southeast and West. Women in their childbearing years, young infants and elderly people tend to be heavy users of health and medical services. As a result, the Southeast and the West have a large concentration of industry companies.



Furthermore, the location of physicians in the Southeast and West reflects the distribution of the population and geographic size of the region.

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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 **Low**

The Ultrasonic Cleaning Equipment Manufacturing industry exhibits a low level of market share concentration. In 2019, the top three companies operating in the industry are expected to collectively generate just over 20.0% of total industry revenue. While the number of operators is low compared with other medical device manufacturing companies, ultrasonic cleaning equipment is a relatively new technology and is expected to grow in line with innovations in industry products. After stagnating during the current period as a result of declining industry revenue, an increasing number of operators are expected to enter the industry during the outlook period due to improved demand conditions. While the largest companies are likely to consolidate, as larger companies acquire smaller producers and their innovative new cleaning solutions to gain market share, such consolidation is not expected to keep up with the overall industry enterprise growth. As a result, IBISWorld expects the total number of industry companies to rise over the five years to 2024, and market share concentration will likely remain low as a result.

Key Success Factors

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

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

Having a good reputation
Customers' purchase criteria often include reliability and performance. Reliability of delivery and product performance are particularly important.

Having contacts within key markets
Access to distributors and end users is essential to successful sales of products.

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.

Cost Structure Benchmarks

The largest cost in the Ultrasonic Cleaning Equipment Manufacturing industry are purchase costs, which primarily consist of steel inputs, along with electronic circuitry and plastics. Profit has declined during the period due to volatile steel prices and an excise tax on industry products.

Wages
Wages account for an expected 18.0% of revenue in 2019. Labor is required in the design and manufacturing of ultrasonic cleaning equipment products. Due to the high level of complexity of industry products, employees are highly skilled and can command high wages. As demand for ultrasonic cleaning equipment has increased and companies have been forced to offer higher wages to entice the most technically skilled employees, industry wage costs have risen as a share of total industry revenue during the five-year period.

Purchases
Purchases are the largest expense for medical device manufacturers. IBISWorld estimates that purchases will consume 34.9% of total industry revenue in 2019. Purchased materials include fabricated metal products, printed circuit

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Competitive Landscape

Cost Structure Benchmarks continued

boards, semiconductors, electronic circuitry products, fabricated plastic products, current-carrying wiring devices, electronic computing equipment and other equipment required for the design and manufacturing of ultrasonic cleaning equipment. Purchases' share of industry revenue has risen over the five years to 2019, due to rising steel prices.

Profit

Profit (measured as earnings before interest and taxes) in the industry varies according to company size, product type and various other factors. IBISWorld estimates that in 2019, operating profit will reach 4.8% of total industry revenue. Manufacturers have experienced a 2.3% excise tax on sales of ultrasonic cleaning devices used in medicine, which took effect just before the period in 2013. The excise tax is tax deductible, making the effective tax impact 1.5%. The tax is based on revenue, not profit; therefore, a medical device company with a lower profit margin will experience a greater negative impact. This tax, along with volatile steel prices, has negatively affected industry profit, resulting in a decline from 6.6% in 2014.

Depreciation

Depreciation costs are relatively low in this industry, due to the relatively low rate of wear-and-tear for industry manufacturing equipment. In 2019, depreciation costs are expected to account for 1.8% of industry revenue.

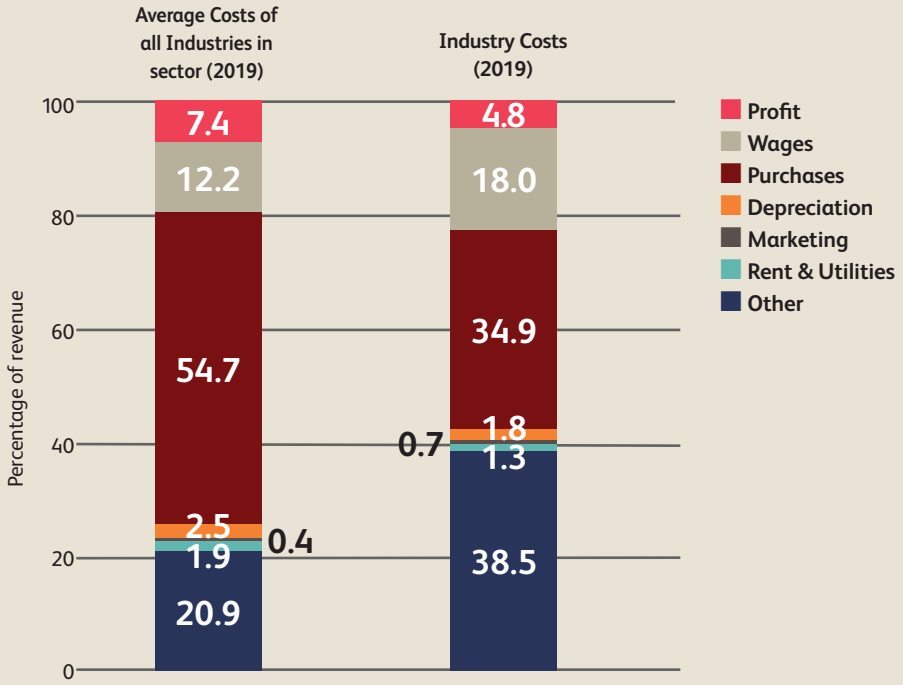
Marketing

Marketing costs are expected to account for 0.7% of industry revenue.

Rent

Rent costs are only expected to account for 0.8% of industry revenue in 2019, due

Sector vs. Industry Costs



SOURCE: WWW.IBISWORLD.COM

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Competitive Landscape

Cost Structure Benchmarks continued

to the relatively small amount of physical facilities in this industry.

Utilities

Utilities are expected to account for 0.5% of industry revenue.

Other

Other industry costs include freight, insurance, legal and financial services and costs associated with assuring compliance with environmental standards for manufacturers.

Basis of Competition

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

Competition in the Ultrasonic Cleaning Equipment Manufacturing industry is based on quality, performance and pricing. For some major markets, such as the medical and dental field, ultrasonic cleaning equipment is a necessity; as a result, for customers from these fields, the decision is not whether to buy, but which product, based on quality and reliability. However, for some ophthalmology and individual consumers, pricing plays a significant role as well.

Sales are also driven by the introduction of new products that are designed to make ultrasonic cleaning more effective and time efficient. A high level of capital investment is required for research and development of products. Companies that develop new products and manufacturing methods also must invest into patenting ultrasonic cleaning equipment to protect intellectual property.

Pricing heavily affects businesses and households in choosing an ultrasonic cleaning device. The price of ultrasonic cleaning equipment is an important consideration for ophthalmology and veterinary services.

Barriers to Entry

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

The main barriers for new entrants into the Ultrasonic Cleaning Equipment Manufacturing industry are high initial capital investments, heavy regulation, competition and a fast rate of technological change. The products made by this industry are generally manufactured under a patent, which acts as a barrier to entry for new companies due to the cost of adhering to intellectual property laws. The average industry operator spends a significant proportion of industry revenue on research and development. As competition increases, more operators will have to increase expenditure on research and development to maintain a competitive advantage.

Government policy serves as another barrier to entry for potential entrants.

Barriers to Entry checklist

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

SOURCE: WWW.IBISWORLD.COM

Ultrasonic cleaners are subject to regulation from the Federal Food Drug and Cosmetic Act, which monitors and enforces the requirements for ultrasonic cleaners used for medical purposes. These regulations concern the effectiveness, quality, performance and marketing for ultrasonic cleaners.

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Competitive Landscape

Industry Globalization

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

The Ultrasonic Cleaning Equipment Manufacturing industry experiences a moderate level of globalization, with many industry operators participating in or owning international operations and subsidiaries abroad. There are also a significant number of foreign companies that have establishments and facilities in the United States. Globalization is expected to increase over the coming years as more companies enter the industry and US operators attempt to expand into foreign markets.

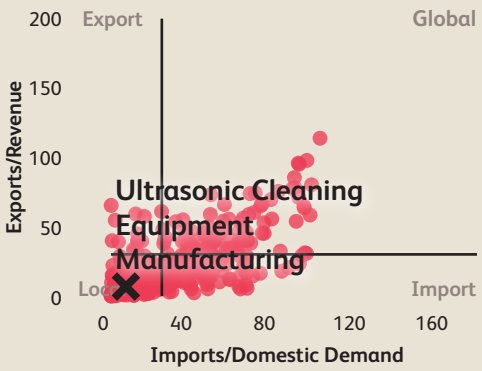
The industry is experiencing more competition from international companies, particularly from companies in East Asia. Demand for medical equipment and other devices is growing in emerging markets such as Mexico, where the middle class is expanding and seeking more quality healthcare. Many industry companies in the United States are starting to design and manufacture products tailored to these emerging markets, where price is a greater concern than in the United States.

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

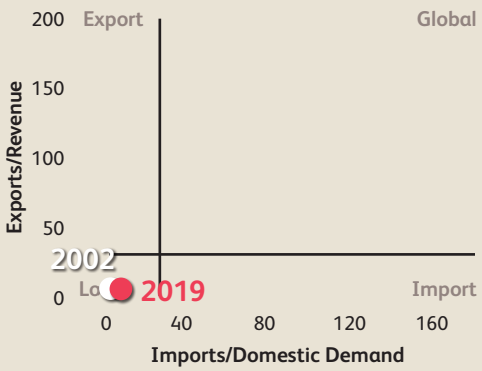
Exports offer growth opportunities for firms. However there are legal, economic and political risks associated with dealing in foreign countries.

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: Ultrasonic Cleaning Equipment Manufacturing 2002–2019

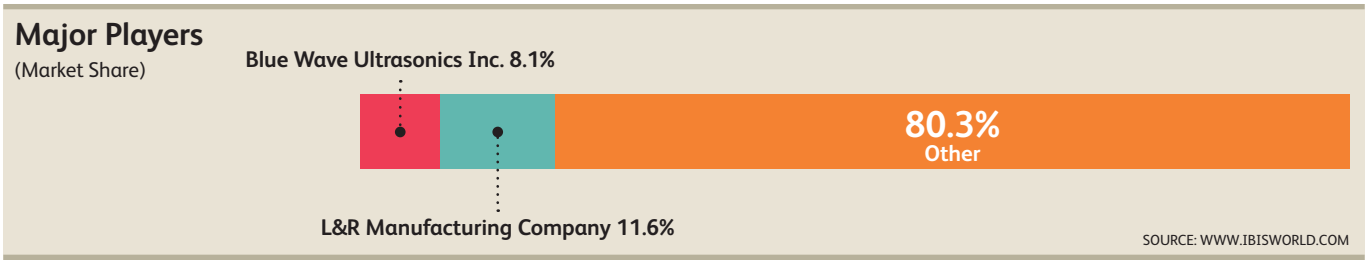


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Major Companies

L&R Manufacturing Company | Blue Wave Ultrasonics Inc. | Other Companies



Player Performance

L&R Manufacturing Company
Market Share: 11.6 %

L&R Manufacturing Company operates in the Ultrasonic Cleaning Equipment Manufacturing industry through L&R Ultrasonics (L&R). The company was founded in 1928 and is headquartered in Kearny, NJ. L&R employs more than 100 workers and offers several different ultrasonic cleaning systems. Although they are a private company and do not publish revenue figures, IBISWorld estimates that L&R is the largest company in this industry. The company specifically markets products for usage in dental, medical and industrial users, along with products designed for jewelry cleaning and firearms maintenance.

Its standard line is referred to as the Quantrex System, which is offered in six different models. This line's materials and workmanship are guaranteed for two-and-a-half years and are sold with an inclusive package of a timer, drain and cover. L&R also offers a line referred to as the SweepZone system. This line is also offered in six different models; however, as opposed to a standard operating system, it includes an additional wave of energy that sweeps back and forth throughout the ultrasonic tank. This helps the system provide a more uniform cleaning by eliminating hot spots and weak areas in the tank.

Financial performance

In addition to ultrasonic cleaning solutions, L&R also offers several other product lines to help in the cleaning of medical devices, as well as dentures, scuba gear, firearms and handcuffs. One of L&R's newest ultrasonic models is particularly designed to handle dental work such as dentures, crowns, partials and bridges in an effort to establish a presence in the growing home sales

L&R Manufacturing Company (US industry-specific segment) - financial performance*

Year	Revenue ($ million)	(% change)	Operating Income ($ million)	(% change)
2014	61.8	N/C	4.1	N/C
2015	61.2	-1.0	3.9	-4.9
2016	63.1	3.1	4.1	5.1
2017	62.8	-0.5	3.1	-24.4
2018	62.7	-0.2	2.8	-9.7
2019	63.1	0.6	3.1	10.7

*Estimates

SOURCE: IBISWORLD

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Major Companies

Player Performance continued

market. Over the five years to 2019, the company's revenue is expected to decline at an annualized rate of 0.4% to total $63.1 million, giving the company an 11.6% share of total industry revenue this year.

Player Performance

Blue Wave Ultrasonics Inc.
Market Share: 8.1 %

Blue Wave Ultrasonics Inc. (Blue Wave), formerly known as Swen Sonic Corporation and Bendix Corporation, began in 1952 when Bendix took ultrasonic cleaning out of the laboratory and into production for the cleaning of delicate aircraft parts. Bendix focused primarily on pioneering the usage of ultrasonic cleaning for industrial applications. A group of executives purchased the business to form Swen Sonic in the 1980s and with the development of new technologies, Swen Sonic became Blue Wave.

The company is headquartered in Davenport, IA, and is estimated to have over 100 employees. The company's system uses a silver brazed magnetostrictive transducer in place of the more common piezoelectric transducer. The Blue Wave transducer converts electrical energy into mechanical vibrations more efficiently, offering shorter cleaning cycles and reduced energy consumption. The company primarily serves industrial markets, while also marketing products for hospitals and usage in other medical settings.

Financial performance

Blue Wave offers two versions of its product: an industrial cleaning system and a medical cleaning system. Both products use the silver brazed transducer and are made of stainless steel. Through these product offerings, the company sells to downstream clients in the healthcare, hospital, medical, optical, pharmaceutical, aerospace, electronics and automotive industries. Its products are able to rid delicate components of blood, carbon, grease, mold and dirt, among other contaminates. IBISWorld expects revenue for the company to increase an annualized 0.4% over the five years to 2019, totaling $43.7 million. In 2019, the company is expected to hold an 8.1% market share.

Blue Wave Ultrasonics Inc. (US industry-specific segment) - financial performance*

Year	Revenue ($ million)	(% change)	Operating Income ($ million)	(% change)
2014	42.9	N/C	2.8	N/C
2015	42.4	-1.2	2.7	-3.6
2016	43.7	3.1	2.8	3.7
2017	43.5	-0.5	2.1	-25.0
2018	43.5	0.0	2.0	-4.8
2019	43.7	0.5	2.1	5.0

*Estimates

SOURCE: IBISWORLD

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Major Companies

Other Company Performance

Mettler Electronics Corporation
Market Share: 0.4 %

Mettler Electronics Corporation (Mettler) was established in 1957 by Hall Mettler. The company is solely located and headquartered in Anaheim, CA. Mettler is primarily engaged in the manufacturing and sale of ultrasound and electrostimulation therapy equipment; however, the company also produces ultrasonic cleaners, introducing its first Cavitator Ultrasonic Cleaner in 1960.

Mettler's ultrasonic cleaners, like all products in the industry, work through the process of cavitation. In this process, millions of tiny bubbles are created by ultrasonic waves; the bubbles then gently clean and polish the surface of medical devices and other delicate items to remove any trapped dirt and debris. Mettler also sells a biodegradable detergent entitled Cavi-Clean. The detergent is useful in the medical and dental industries because it was created to aid in the dissolving of blood off of medical instruments.

Mettler holds a total of 15 patents and claims to sell 60.0% of the world's ultrasound products. Its industry-relevant product line of ultrasonic cleaners is estimated to account for 17.4% of total company revenue. The company focuses the sales of its ultrasonic cleaners toward the medical industry, but the products can also be used for a range of glassware, jewelry and other delicate items. Mettler's industry-relevant revenue is estimated to reach $2.1 million in 2019.

Other Company Performance

Crest Ultrasonics Corporation
Market Share: N/A

Crest Ultrasonics Corporation (Crest) was founded in 1961. The company operates through several subsidiaries and employs more than 960 people worldwide. While Crest is headquartered in Trenton, NJ, the company's manufacturing operations are primarily conducted 65,000-square-foot manufacturing facility in Penang, Malaysia. This makes Crest one of the largest importers into the US market, but not technically a participant in this industry. Crest has vertically integrated itself in the industry to provide machine and component cost reduction and quality control. One of Crest's subsidiaries, Piezo Kinetics Inc., manufactures the ceramic components that act as the foundation of the company's cleaning devices. These ceramic components transmit sound at higher frequencies than metals (e.g. steel, titanium and aluminum), enabling superior contaminant removal and reduced damage to sensitive parts.

The company manufactures a wide range of ultrasonic cleaning products, including aqueous industrial cleaners, solvent industrial cleaners, biomedical cleaners, ultrasonic transducers and firearms cleaners; Crest also offers customized cleaning solutions. Crest's clients operate across multiple sectors, including the biomedical, medical devices, pharmaceutical, orthopedics, defense, aerospace, electronics and fine gems and jewelry industries; clients range from *Fortune 500* companies to small, independent companies.

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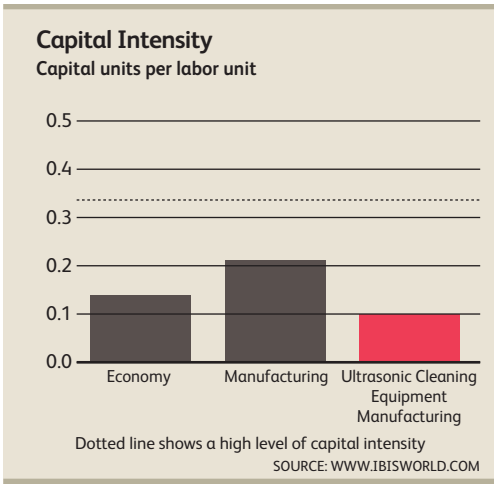
Operating Conditions

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

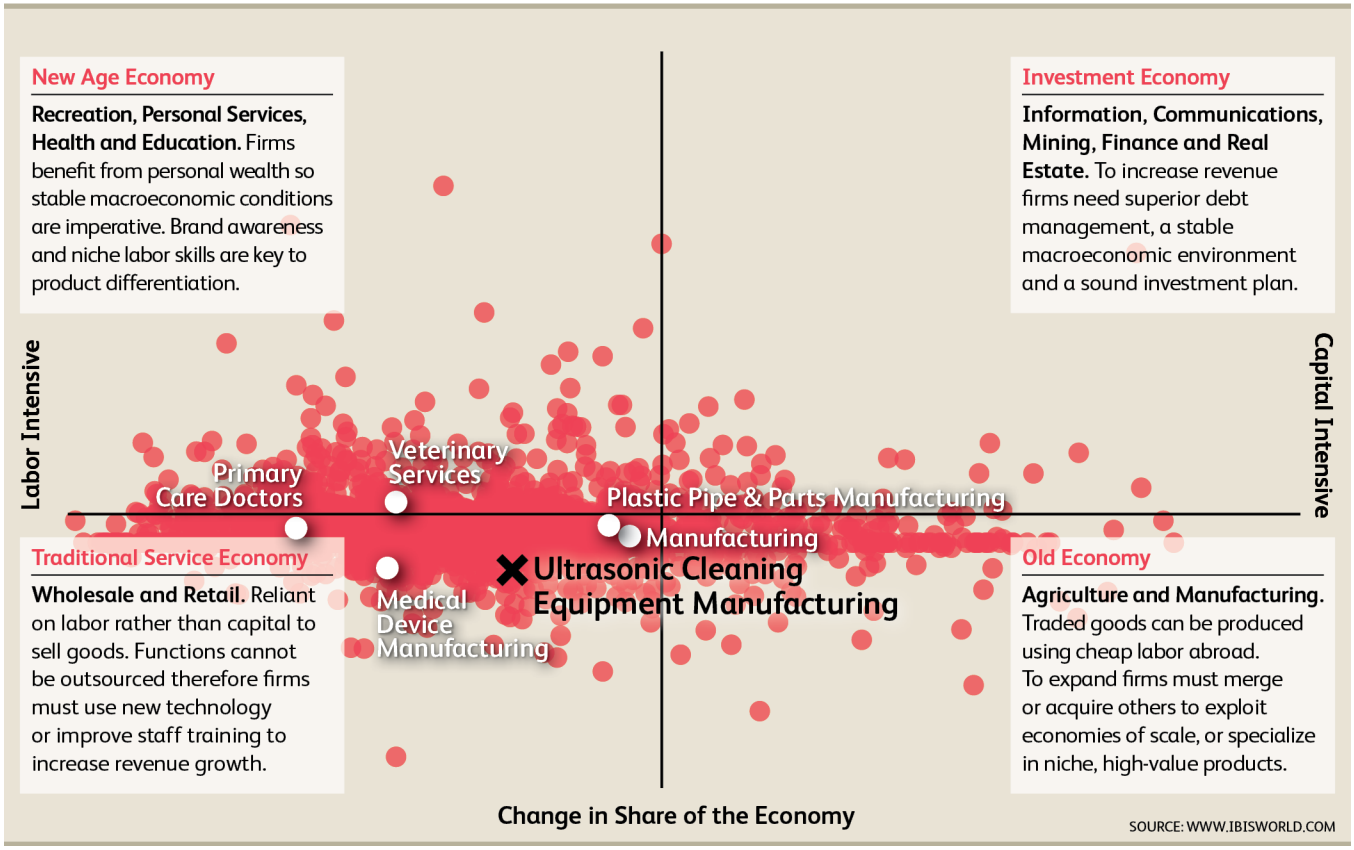
Capital Intensity

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

The Ultrasonic Cleaning Equipment Manufacturing industry is characterized by a low level of capital intensity. For every dollar that is spent on labor in 2019, an estimated $0.10 is spent on capital expenditures. Ultrasonic cleaning equipment manufacturers produce a highly technical product that requires a high level of precision and technical skill. As a result, the industry requires highly educated and skilled engineers to design, plan and patent the manufacturing of industry products. However, the industry also must purchase depreciable equipment; once the design is complete, most manufacturing processes are conducted primarily by precision robotics.



Tools of the Trade: Growth Strategies for Success



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Operating Conditions

Technology and Systems

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

The Ultrasonic Cleaning Equipment Manufacturing industry experiences a high level of technological change. Sales are driven by product innovation, as many of the industry's major markets seek to use the newest and most effective ultrasonic cleaning equipment. Intellectual property and patents are heavily enforced by industry players and serve as the most significant tool for competition.

Ultrasonic cleaners use ultrasound, a cyclic sound pressure wave that agitates a cleaning solvent to clean delicate items. Contaminants such as dust, dirt, oil and bacteria are removed when placed in ultrasonic cleaning equipment. The agitation of the solvent removes these contaminants, which are attached to metals, plastics, glass, rubber and ceramics. Cleaning takes place when high frequency bursts of ultrasonic energy are applied to the heated liquid cleaning solution. In addition to the cleaning solution, temperature and action of the solvent, a mechanical action such as rotation and spray under submersion are applied to help remove contaminants. Ultrasonic cleaning makes it easier to remove small particles from inaccessible areas, making it ideal for small or delicate instruments. As a result of the precise nature of the instruments, ultrasonic cleaners require significant investment in research and development.

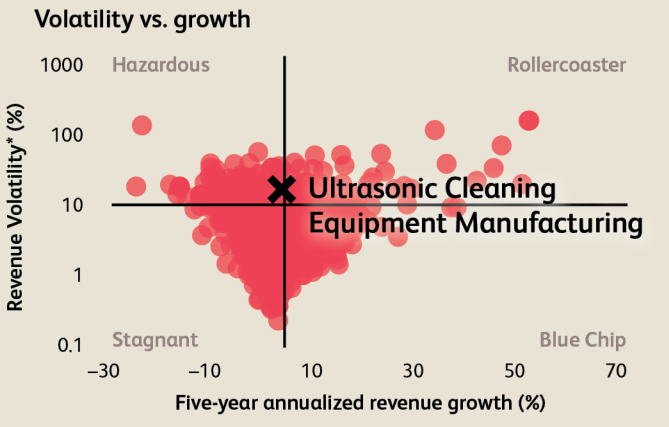
Revenue Volatility

Level
The level of volatility is **High**

The Ultrasonic Cleaning Equipment Manufacturing industry has experienced a high degree of revenue volatility over the five years to 2019. Revenue for the industry fell by as much 21.9% in 2014 as demand from the healthcare sector was driven down by a combination of Hospital Readmissions Reduction Program (HRRP) penalties and reduced Medicare reimbursement, while industrial demand also lagged. Meanwhile, the industry grew as much as 19.0% the following year in 2015, as rising health expenditure and rebounding industrial activity increased demand for industry products. Steady demand growth fueled by a combination of expected growth in total health expenditure and an anticipate increase in industrial activity will likely limit revenue volatility over the outlook period.

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.



SOURCE: WWW.IBISWORLD.COM

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Operating Conditions

Regulation and Policy

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

The Ultrasonic Cleaning Equipment Manufacturing industry is subject to regulation by numerous government agencies and international groups. The major regulating bodies affecting the industry include the Food and Drug Administration (FDA) and the Global Harmonization Task Force (GHTF).

The FDA governs the laws and regulations relating to the development, testing, manufacturing, labeling, marketing and distribution of ultrasonic cleaning equipment. The basic regulatory requirements that manufacturers of ultrasonic cleaning equipment distributed in the US must comply with are discussed below.

Good Manufacturing Practices (GMP) require that domestic or foreign manufacturers have a quality system for the design, manufacture, packaging, labeling, storage, installation and servicing of finished ultrasonic cleaning equipment intended for commercial distribution in the United States. Quality System (QS) regulations help to ensure that ultrasonic cleaning equipment are safe and effective for their intended use.

The FDA governs various labeling regulations pertaining to the following medical goods: general devices, in vitro diagnostic products, investigational devices and general electronic products.

Imports are subject to the same regulations as domestically produced goods. Exceptions are made for approved or unapproved import ultrasonic cleaning equipment parts, components or subassemblies that may be imported for further processing or incorporation into unapproved ultrasonic cleaning equipment that are to be subsequently exported. Operators are not permitted to import finished unapproved ultrasonic cleaning equipment without prior marketing clearance, even if the product is to be imported solely for subsequent export.

Each foreign country has specific regulations concerning industry products. Companies generally obtain regulatory approval for ultrasonic cleaning equipment in foreign countries before they are approved in the United States because foreign systems are often faster and simpler than that of the United States. In the European Union, a single regulatory approval process has been created, and approval is represented by the CE Marking certificate.

The Global Harmonization Task Force (GHTF) encourages convergence in regulatory practices across Europe, Asia-Pacific and North America. The group endeavors to ensure the safety, effectiveness, performance and quality of ultrasonic cleaning equipment used in medical services, promote technological innovation and facilitate international trade. The GHTF bases its harmonized guidance documents on regulatory practices from the above geographic areas.

Industry Assistance

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

The Ultrasonic Cleaning Equipment Manufacturing industry receives no direct form of government assistance. However, participants receive assistance via trade associations and organizations. AdvaMed is the largest medical technology association in the world and represents manufacturers of medical equipment. AdvaMed promotes speedier product approvals by industry regulators worldwide; more timely coverage and payment determinations globally; fair access to international markets; and effective communications regarding the value of medical technology to key audiences including legislators, regulators, medical societies and patient organizations.

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Key Statistics

Industry Data

	Revenue ($m)	Industry Value Added ($m)	Establish-ments	Enterprises	Employment	Exports ($m)	Imports ($m)	Wages ($m)	Domestic Demand	Total health expenditure ($ trillion)
2010	492.5	130.1	24	21	1,134	23.6	30.7	81.8	499.6	2.7
2011	539.8	142.0	28	25	1,332	27.3	39.0	96.1	551.5	2.7
2012	599.1	164.2	29	25	1,373	24.3	38.5	102.5	613.3	2.8
2013	590.1	149.5	28	25	1,281	14.2	43.7	100.5	619.6	2.8
2014	461.1	122.9	24	21	1,119	15.4	39.1	85.5	484.8	2.9
2015	548.7	147.2	29	26	1,345	17.1	40.8	101.6	572.4	3.1
2016	516.4	136.9	27	24	1,228	12.4	40.6	93.1	544.6	3.2
2017	522.2	129.4	28	25	1,247	12.9	40.2	94.4	549.5	3.2
2018	531.7	130.1	28	26	1,272	9.1	46.2	96.2	568.8	3.3
2019	542.1	133.9	29	26	1,289	9.5	47.3	97.7	579.9	3.4
2020	550.6	135.7	29	26	1,302	9.7	44.1	98.8	585.0	3.5
2021	559.4	137.6	29	27	1,320	10.1	45.0	100.1	594.3	3.6
2022	568.5	140.4	30	27	1,347	10.0	43.7	102.1	602.2	3.7
2023	576.8	142.1	30	27	1,361	10.1	43.9	103.2	610.6	3.9
2024	585.1	144.1	31	28	1,381	10.2	42.9	104.8	617.8	4.0

Annual Change

	Revenue (%)	Industry Value Added (%)	Establish-ments (%)	Enterprises (%)	Employment (%)	Exports (%)	Imports (%)	Wages (%)	Domestic Demand (%)	Total health expenditure (%)
2011	9.6	9.1	16.7	19.0	17.5	15.7	27.0	17.5	10.4	0.0
2012	11.0	15.6	3.6	0.0	3.1	-11.0	-1.3	6.7	11.2	3.7
2013	-1.5	-9.0	-3.4	0.0	-6.7	-41.6	13.5	-2.0	1.0	0.0
2014	-21.9	-17.8	-14.3	-16.0	-12.6	8.5	-10.5	-14.9	-21.8	3.6
2015	19.0	19.8	20.8	23.8	20.2	11.0	4.3	18.8	18.1	6.9
2016	-5.9	-7.0	-6.9	-7.7	-8.7	-27.5	-0.5	-8.4	-4.9	3.2
2017	1.1	-5.5	3.7	4.2	1.5	4.0	-1.0	1.4	0.9	0.0
2018	1.8	0.5	0.0	4.0	2.0	-29.5	14.9	1.9	3.5	3.1
2019	2.0	2.9	3.6	0.0	1.3	4.4	2.4	1.6	2.0	3.0
2020	1.6	1.3	0.0	0.0	1.0	2.1	-6.8	1.1	0.9	2.9
2021	1.6	1.4	0.0	3.8	1.4	4.1	2.0	1.3	1.6	2.9
2022	1.6	2.0	3.4	0.0	2.0	-1.0	-2.9	2.0	1.3	2.8
2023	1.5	1.2	0.0	0.0	1.0	1.0	0.5	1.1	1.4	5.4
2024	1.4	1.4	3.3	3.7	1.5	1.0	-2.3	1.6	1.2	2.6

Key Ratios

	IVA/Revenue (%)	Imports/ Demand (%)	Exports/ Revenue (%)	Revenue per Employee ($'000)	Wages/Revenue (%)	Employees per Est.	Average Wage ($)	Share of the Economy (%)
2010	26.42	6.14	4.79	434.30	16.61	47.25	72,134.04	0.00
2011	26.31	7.07	5.06	405.26	17.80	47.57	72,147.15	0.00
2012	27.41	6.28	4.06	436.34	17.11	47.34	74,654.04	0.00
2013	25.33	7.05	2.41	460.66	17.03	45.75	78,454.33	0.00
2014	26.65	8.07	3.34	412.06	18.54	46.63	76,407.51	0.00
2015	26.83	7.13	3.12	407.96	18.52	46.38	75,539.03	0.00
2016	26.51	7.46	2.40	420.52	18.03	45.48	75,814.33	0.00
2017	24.78	7.32	2.47	418.77	18.08	44.54	75,701.68	0.00
2018	24.47	8.12	1.71	418.00	18.09	45.43	75,628.93	0.00
2019	24.70	8.16	1.75	420.56	18.02	44.45	75,795.19	0.00
2020	24.65	7.54	1.76	422.89	17.94	44.90	75,883.26	0.00
2021	24.60	7.57	1.81	423.79	17.89	45.52	75,833.33	0.00
2022	24.70	7.26	1.76	422.05	17.96	44.90	75,798.07	0.00
2023	24.64	7.19	1.75	423.81	17.89	45.37	75,826.60	0.00
2024	24.63	6.94	1.74	423.68	17.91	44.55	75,887.04	0.00

Figures are in inflation-adjusted 2019 dollars.

SOURCE: WWW.IBISWORLD.COM

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Jargon & Glossary

Industry Jargon

AGITATION The act of moving something vigorously; the shaking or stirring of something.

FREQUENCY The number of times that a periodic function or vibration repeats itself in a specified time.

SOLUTION A homogeneous mixture of two or more substances.

ULTRASONIC Pertaining to a frequency greater than 20,000 Hz, approximately the upper limit of human hearing.

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.

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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