

F R O S T & S U L L I V A N

FROST & SULLIVAN BEST PRACTICES AWARD

MECHANICAL SEALS - GLOBAL

Market Leadership 2019



FROST & SULLIVAN

2019

BEST
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AWARD

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Background and Company Performance

Industry Challenges

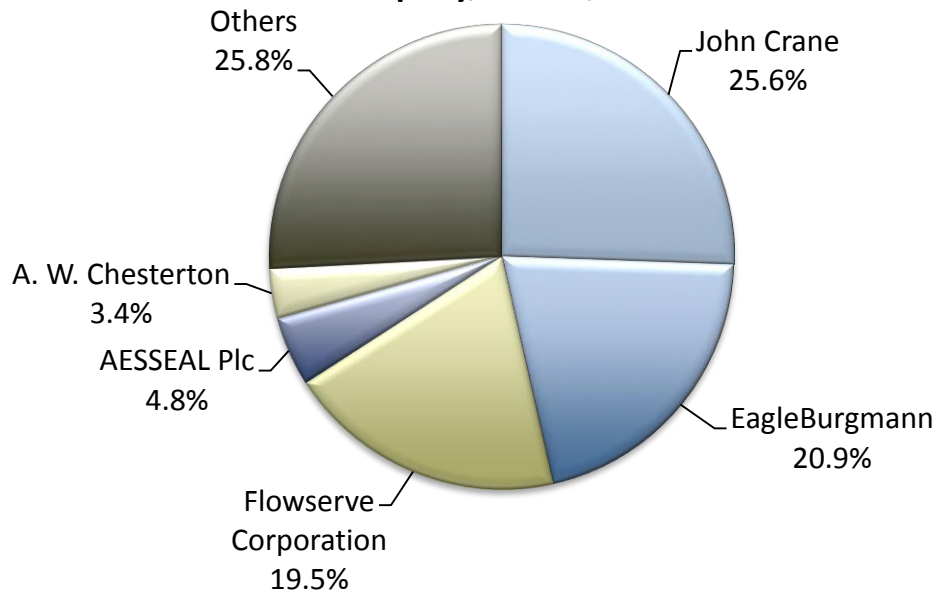
The growth of major end-user process industries, such as oil and gas, water and wastewater, food and beverages, and chemical, are linked to GDP growth rates. Certain product segments that serve these industries are considered commodities, such as mechanical seals, with price and delivery time of parts and service being the major differentiating factors. Still, product manufacturers claim difficulty in finding applications that allow them to maintain their expected growth, which contributes to the healthy merger and acquisition (M&A) climate experienced in certain product markets that serve process industries. For instance, the global mechanical seals market is mature, with an average growth of 3.0 to 5.0%.

Nonetheless, process industries are challenged by severe operating conditions and exposure to corrosion that threaten equipment functionality. Mechanical seals are critical components that enable process equipment to withstand conditional adversities. In the oil and gas market, for example, seals ensure consistent performance of deep-water offshore pumps that are exposed to high pressure and temperature. A seal failure is catastrophic; as retrieval of a faulty pump, its repair and reinstallation is an extremely costly undertaking. As such, product quality is critical in process industries.

Moreover, for process enterprises to improve business performance, their operational decisions must be based on real-time diagnostics that aligns with optimizing asset effectiveness to achieve higher profitability. As process industries are experiencing shortage of manpower due to an aging population, as well as an economic climate that favors a reduced workforce, end users are seeking diagnostic solutions that can compensate for the limited availability of skilled technicians and other maintenance personnel.

Market Leadership of John Crane

Total Mechanical Seals Market: Percent Revenue Share by Company, Global, 2018



Source: [Frost & Sullivan report K38D-10](#)

Leveraging Product Quality to Grow in a Saturated and Mature Market

The global mechanical seals market is highly concentrated with the top 3 manufacturers contributing 66.0% revenue share and the top 5 claiming 74.2% share of the total market revenue in 2018. As a result, gaining market share is a tough challenge.

Despite market concentration, the Chicago-based US company John Crane has been steadily increasing its product presence. Based on Frost & Sullivan's market research, the key reason for this success is the company's unwavering focus on product quality. This commitment is amply illustrated in a customer success story from the mining industry.

In 2009, a US kaolin mineral mine¹ was facing challenges with its pump having a mean-time-between-failure (MTBF) of only 3 to 6 weeks. John Crane was brought in to analyze the problem and suggest improvements. After analyzing the application, John Crane developed a unique face configuration for its mechanical seals specifically for this application, 5620 USP. After the product upgrade, the mine's pump has been operating for over 10 years without any breakdown, a 8566% increase in MTBF. This success case illustrates the significant quality and technology leadership exhibited by the company's products. The meticulous attention paid to product quality has enabled John Crane to increase its market share from 20.1% in 2010¹ to 25.6% in 2018².

¹ Company cannot be named due to non-disclosure agreement

² [Global Mechanical Seals Market \(M769-10\)](#)

³ [Global Mechanical Seals Market, Forecast until 2023 \(K38D-10\)](#)

Demonstrating Growth Strategy Excellence through Focused Vision

In 2018, John Crane led the global competition with 25.6% revenue share. Such significant success is rooted in hard-won industry expertise; the company's legacy dates back over 100 years to its establishment in 1917. This industry pioneer is present in more than 50 countries, with a strong global footprint spanning more than 200 facilities, supported by more than 230 sales and service center locations. While its overall revenue was more than \$1,100 million in 2018, its revenue in the mechanical seals segment is estimated at \$930.0 million, and the oil and gas industry accounts for 55% of this revenue. For the past three years, John Crane's year-over-year growth has been more than the market growth, aiding in its increased market share. This accelerated growth is largely attributed to the company's continuous focus on expanding its market presence through 4 major strategies:

New product development

As a leader in the mechanical seals industry, John Crane continues to release new products that push the envelope on technology adoption. For example, in April 2019, it released the world's first single-use cartridge seals, which are specially designed for wet applications and to reduce installation time by more than 50%. Additionally, the company recently released its Predictive Diagnostic System to provide real-time health assessments and predictive diagnostics for mechanical seals.

Continued expansion into high-growth industries

John Crane has established a major presence in high-growth industries such as unconventional upstream oil and gas production, petrochemicals, liquefied natural gas (LNG), and power generation.

Maximizing aftermarket performance through expansion of customer service centers

John Crane continues to increase its global service footprint as an addition to its 17 super service centers around the globe and 230 service center locations. For example, this year alone it has opened 4 service centers in India, Ireland, Qatar, and South Korea, and 1 super service center in India.

Strategic acquisitions

John Crane acquired Advanced Diamond Technologies in 2019 to help improve the efficiency of seal performance, and it acquired Seebach 2018 to increase its market presence in high growth segments, such as energy and petrochemicals.

Frost & Sullivan firmly believes that John Crane's focused growth strategy will help it increase its market presence and maintain its leadership position in the global market.

Service Protocol Improves Overall Customer Ownership Experience

In process industries, the response time for servicing equipment is a matter of critical urgency. End users prefer best-in-class solution providers who have strong servicing capabilities and robust networks, as lack of efficient servicing leads to significant drop in

plant profitability. John Crane has carved a niche for itself through provision of an outstanding service portfolio and rapid customer response deployed via a global network of service personnel that offers customers immediate access to technical consultants, replacement parts, and extensive service and repair options.

While other companies use one or two service channels, John Crane has four distinct service channels: dedicated sales force, 17 super service centers around the globe, 230 service center locations, and a large network of distributors. These channels enable the company to quickly dispatch the required personnel and replacement parts directly to customers' work sites, ensuring that plant downtime is minimized as much as possible. A case in point is that of a major North American oil and gas plant operator that faced process issues with one of its pieces of equipment. The industry average turnaround for such an issue is 10 to 15 days, which typically leads to a shutdown. The convenient availability of John Crane's service personnel near the customer site, however, ensured that the issue was attended to immediately, and the operator was able to resume use of the equipment at the earliest, without much downtime and avoiding a costly shutdown.

Leveraging Emerging Technologies to Drive Operational Excellence

More than a century of experience aiding end users in solving their operational challenges prepared John Crane to develop its pioneering Predictive Diagnostic System that enables operators and engineers to monitor the performance of plant equipment in real time. John Crane's diagnostics solution provides the information necessary for the operational team to act before a critical failure point is reached, instead of reacting to an unanticipated breakdown. While many solution providers check on equipment health only after diagnostic tests are performed, meaning that a diagnostic procedure must be run on all equipment, resulting in each one being shut down for a period of time, John Crane's solution leverages artificial intelligence and machine learning capabilities to collect and analyze data from various plants to show equipment health status without interrupting production. The analysis indicates which components are failing, allowing end users to take corrective action on components deemed a potential liability to plant operation. This proactive solution also allows end users to estimate how long a device will continue to run without servicing.

Moreover, these diagnostic solutions provide actionable maintenance insights on how to restore the device to peak performance, which reduces the need for skilled technicians. While other solutions raise alarms that can be difficult for operators to interpret, John Crane's predictive diagnostic system leverages its well-established expertise to translate alerts into actionable insights. Leveraging machine learning and artificial intelligence, John Crane has designed the leading-edge diagnostic solution for the mechanical seals market, providing critical services to several process industries, while other solutions focus on statistical models and are hence limited in their analytical capabilities. Frost & Sullivan firmly believes that John Crane's technology is superior to solutions offered by its competition.

Brand Equity Enabling Expansion of Customer Base

As a global market leader, John Crane offers a unique value proposition by consistently developing and delivering quality products that strengthen its brand equity. John Crane stands out in a crowded marketplace not just for its large market presence but also for its commitment to quality, technology, and leadership. Given the demand for different applications for seals within a single industry, end users prefer to partner with a company that can offer unique metallurgical and technological specifications for all their applications, and John Crane answers this call with its extensive product portfolio, application expertise, and distribution channel presence to provide a one-stop-shop solution. Frost & Sullivan recognizes John Crane is as an impressive, innovative leader that is in touch with both end users and channel partners, focused on continually moving the technological needle forward.

Conclusion

John Crane leads the global mechanical seals market with 25.6% market share. In this mature and concentrated industry, John Crane has been able to increase its market share thanks to its exemplary product quality, unwavering customer service focus, and technology leadership. Frost & Sullivan is quite impressed with John Crane's growth strategy excellence and believes the company is ideally positioned to attain continual growth and expanded market presence, particularly as it leads the industry in emerging applications for AI and ML solutions. Leveraging its proven knowledge and industry expertise, John Crane has developed comprehensive one-stop-shop solutions that allow customers in process industries to achieve operational excellence by generating maximum business impact.

Anchored by strong overall performance, John Crane has sustained its impressive leadership position in the global mechanical seals market, and Frost & Sullivan is proud to bestow it with the 2019 Market Leadership Award.

Significance of Market Leadership

Ultimately, growth in any organization depends on customers purchasing from a company, and then making the decision to return time and again. Loyal customers become brand advocates, brand advocates recruit new customers, and the company grows, and then attains market leadership. To achieve and maintain market leadership, an organization must strive to be best in class in 3 key areas: understanding demand, nurturing the brand, and differentiating from the competition.



Understanding Market Leadership

Driving demand, strengthening the brand, and differentiating from the competition all play critical roles in a company's path to market leadership. This three-fold focus, however, is only the beginning of the journey and must be complemented by an equally rigorous focus on the customer experience. Organizations that demonstrate best practices, therefore, commit to the customer at each stage of the buying cycle and continue to nurture the relationship once the customer has made a purchase. In this way, they build a loyal, ever-growing customer base and methodically add to their market share.

Key Performance Criteria

For the Market Leadership Award, Frost & Sullivan Analysts focused on specific criteria to determine the areas of performance excellence that led to the company's leadership position. The criteria include (although are not limited to) the following:

Criterion	Requirement
Growth Strategy Excellence	There is a demonstrated ability to consistently identify, prioritize, and pursue emerging growth opportunities.
Implementation Excellence	Processes support the efficient and consistent implementation of tactics designed to support the strategy.
Brand Strength	The brand is respected, recognized, and remembered.
Product Quality	The product or service receives high marks for performance, functionality, and reliability at every stage of the life cycle.
Product Differentiation	The product or service has carved out a market niche, whether based on price, quality, or uniqueness of offering (or some combination of the three) that another company cannot easily duplicate.
Technology Leverage	There is a commitment to incorporating leading-edge technologies into product offerings for greater product performance and value.
Price/Performance Value	Products or services offer the best value for the price, compared to similar offerings in the market.
Customer Purchase Experience	Customers feel they are buying the optimal solution that addresses both their unique needs and their unique constraints.
Customer Ownership Experience	Customers are proud to own the company's product or service, and have a positive experience throughout the life of the product or service.
Customer Service Experience	Customer service is accessible, fast, stress-free,

	and of high quality.
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Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan analysts follow a 10-step process to evaluate award candidates and assess their fit with best practices criteria. The reputation and integrity of the awards are based on close adherence to this process.

STEP	OBJECTIVE	KEY ACTIVITIES	OUTPUT
1 Monitor, target, and screen	Identify award recipient candidates from around the world	<ul style="list-style-type: none"> • Conduct in-depth industry research • Identify emerging industries • Scan multiple regions 	Pipeline of candidates that potentially meet all best practices criteria
2 Perform 360-degree research	Perform comprehensive, 360-degree research on all candidates in the pipeline	<ul style="list-style-type: none"> • Interview thought leaders and industry practitioners • Assess candidates' fit with best practices criteria • Rank all candidates 	Matrix positioning of all candidates' performance relative to one another
3 Invite thought leadership in best practices	Perform in-depth examination of all candidates	<ul style="list-style-type: none"> • Confirm best practices criteria • Examine eligibility of all candidates • Identify any information gaps 	Detailed profiles of all ranked candidates
4 Initiate research director review	Conduct an unbiased evaluation of all candidate profiles	<ul style="list-style-type: none"> • Brainstorm ranking options • Invite multiple perspectives on candidates' performance • Update candidate profiles 	Final prioritization of all eligible candidates and companion best practices positioning paper
5 Assemble panel of industry experts	Present findings to an expert panel of industry thought leaders	<ul style="list-style-type: none"> • Share findings • Strengthen cases for candidate eligibility • Prioritize candidates 	Refined list of prioritized award candidates
6 Conduct global industry review	Build consensus on award candidates' eligibility	<ul style="list-style-type: none"> • Hold global team meeting to review all candidates • Pressure-test fit with criteria • Confirm inclusion of all eligible candidates 	Final list of eligible award candidates, representing success stories worldwide
7 Perform quality check	Develop official award consideration materials	<ul style="list-style-type: none"> • Perform final performance benchmarking activities • Write nominations • Perform quality review 	High-quality, accurate, and creative presentation of nominees' successes
8 Reconnect with panel of industry experts	Finalize the selection of the best practices award recipient	<ul style="list-style-type: none"> • Review analysis with panel • Build consensus • Select recipient 	Decision on which company performs best against all best practices criteria
9 Communicate recognition	Inform award recipient of award recognition	<ul style="list-style-type: none"> • Present award to the CEO • Inspire the organization for continued success • Celebrate the recipient's performance 	Announcement of award and plan for how recipient can use the award to enhance the brand

STEP	OBJECTIVE	KEY ACTIVITIES	OUTPUT
10 Take strategic action	Upon licensing, company is able to share award news with stakeholders and customers	<ul style="list-style-type: none"> • Coordinate media outreach • Design a marketing plan • Assess award's role in strategic planning 	Widespread awareness of recipient's award status among investors, media personnel, and employees

The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of the research process. It offers a 360-degree-view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often companies make important growth decisions based on a narrow understanding of their environment, resulting in errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry participants and for identifying those performing at best-in-class levels.

360-DEGREE RESEARCH: SEEING ORDER IN THE CHAOS



About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, helps clients accelerate growth and achieve best-in-class positions in growth, innovation and leadership. The company's Growth Partnership Service provides the CEO and the CEO's growth team with disciplined research and best practices models to drive the generation, evaluation and implementation of powerful growth strategies. Frost & Sullivan leverages nearly 60 years of experience in partnering with Global 1000 companies, emerging businesses, and the investment community from 45 offices on 6 continents. To join Frost & Sullivan's Growth Partnership, visit <http://www.frost.com>.