

Linear Motion System Market – Global Industry Size, Share, Trends, Opportunity, and Forecast Segmented, By Type (Single-axis Linear Motion System and Multi-axis Linear Motion System), By End-user Industry (Automotive, Electronics and Semiconductor, Manufacturing, Aerospace, and Healthcare) By Region, Competition 2018-2028.

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Abstracts

Global Linear Motion System Market was valued at USD 7.8 Billion in 2022 and is anticipated to project robust growth in the forecast period with a CAGR of 7.25% through 2028, The demand from industries like automotive, consumer electronics, and healthcare has increased in the post-pandemic situation, and this is anticipated to boost the demand for the market studied. Asia-Pacific is anticipated to witness significant growth in the linear motion system market owing to an increase in industrial activities, technological advancements, the rise in government investments in industrial automation systems, and the presence of well-established players providing these systems.

The region has several industries, including automotive, pharmaceutical, food and beverages, and machine manufacturing. Apart from these, the region is also home to a large semiconductor industry. The increasing degree of miniaturization in various fields of applications leads to a rise in the production of different linear motion systems.

The significant adoption of linear actuators and other systems is also expected to drive the market. China dominates the region due to the increased adoption of motion systems from the vast deployment of the massive electronic and automotive manufacturing sectors. As the market also develops at high speed in other regional

economies, such as India, there is enormous potential for growth in the market studied.

The shift in technology from pneumatic and hydraulic systems toward electromechanical systems to meet the increasing demand for flexibility, reliability, higher precision, and greater efficiency with reduced energy usage are some of the reasons that are expected to drive the demand for linear motion systems. This, in turn, is expected to boost the growth of the market. The growing trend of machinery to facilitate greater efficiency is expected to continue and sustain industrial development, especially in Asia-Pacific.

Further, the automobile industry's shift toward autonomous and electrified vehicles has created a massive opportunity for linear motion systems in the automotive industry. The need for various linear motion systems is expanding in the automotive sector due to the increased adoption of automation in the automotive manufacturing process and the involvement of digitalization and AI.

Key Market Drivers

Linear Motion Systems Provide a Range of Benefits

Linear motion systems provide a range of benefits, including smooth and reliable motion along a single plane, high positioning accuracies, and the ability to achieve high acceleration rates and long travel lengths with good thrust forces. Additionally, linear motion technology can increase production flexibility by allowing for quick and easy implementation in both existing and new systems.

Further, the market is driven by many factors, including the shift in technology from hydraulic and pneumatic systems toward electromechanical systems to achieve higher precision, flexibility, reliability, and efficiency with less energy usage. These systems are in high demand due to their superior performance in extreme environmental conditions in industries. With reference to some industrial fields, such as packaging and automatic machines, the current trend is the transition from using hydraulic or pneumatic cylinders to electric linear actuators. The primary purpose is to have better control and greater versatility in automation and detailed customization of the machine or system in which the electric linear actuator is mounted.

The Market is Driven by Many Factors, Including the Shift in Technology

Linear motion systems have a diverse range of applications in manufacturing. They are

used to provide precise and accurate positioning of equipment and products, making them suitable for use in automated manufacturing processes. These systems are used in packaging & palletizing, pick & place operations, material handling, precision machining, assembly & disassembly of products, inspection & quality control, die making, etc.

Installation time is a significant challenge for the market. The high component count contributes to a longer and more complex installation process. All corresponding components need to be carefully and correctly positioned and secured for a proper motion to occur. For example, if the lead screw and linear guides are not parallel with one another in both axes, there is a high likelihood of binding occurring, causing the entire drive mechanism to stall out.

The demand from industries like automotive, consumer electronics, and healthcare has increased in the post-pandemic situation, and this is anticipated to boost the demand for the market studied. The global linear motion system market has witnessed significant growth in recent years, and it is expected to continue its upward trajectory in the coming years. Several key drivers and factors contribute to the market's expansion, and understanding these factors is crucial for both industry participants and investors. The Linear Motion System is a sort of system that allows for free motion in a single direction. The system is used to move and handle loads, and it also serves as a protective seal for the mechanical system's inner workings. It includes a wide range of components and controllers to meet a wide range of manufacturing needs while maintaining a high level of accuracy and speed. It is widely used in the transportation and packaging of products in industries such as semiconductors, food and beverage, automotive, and others.

Key Market Challenges

Linear motion systems are assemblies of components that provide linear movement or translation. They are used in a wide range of industries, including manufacturing, packaging, automotive, and medical. Linear motion systems are essential for many automated processes, as they provide the precise and accurate positioning that is required. Challenges in the global linear motion system market

Despite the positive outlook for the global linear motion system market, there are a number of challenges that the industry is facing. These challenges include: High cost of installation and maintenance: Linear motion systems can be complex and expensive to install and maintain. This can be a barrier to entry for small and medium-sized

businesses.

Lack of skilled manpower

The operation and maintenance of linear motion systems requires skilled workers. There is a shortage of such workers in many countries, which can hinder the growth of the market.

Competition from low-cost suppliers: There are a number of low-cost suppliers of linear motion systems from countries such as China. This competition can put pressure on the prices of linear motion systems from established manufacturers.

There are a number of ways that the linear motion system industry can overcome the challenges that it is facing. These include: **Developing more affordable and easier-to-install linear motion systems:** Manufacturers need to develop linear motion systems that are more affordable and easier to install and maintain. This would make linear motion systems more accessible to small and medium-sized businesses.

Investing in training programs for skilled workers: The industry needs to invest in training programs to develop a pool of skilled workers who can operate and maintain linear motion systems. This would help to address the shortage of skilled workers in the industry.

Focusing on innovation and differentiation: Manufacturers need to focus on innovation and differentiation to stay ahead of the competition from low-cost suppliers. This can be done by developing new and innovative linear motion systems, as well as by offering value-added services such as design and engineering support.

Key Market Trends

The global need for automation in industrial applications is growing, which is good news for the Linear Motion Systems industry. Due to strict quality inspection standards, improved precision, adaptability, dependability, and greater efficiency, linear motion systems are frequently employed. Additionally, as consumer knowledge of linear motion systems' environmental benefits grows, so has their use across various industrial sectors, including manufacturing, packaging, and the automobile industry. As a result, carbon emissions are reduced, promoting Linear Motion Systems market expansion. A further factor driving the Linear Motion Systems market expansion is the extensive integration of the Internet of Things (IoT) and machine learning (ML), which has made it

possible for users to collect machine data, track and evaluate system performance, and assure prompt maintenance and problem-early detection. Additionally, the Linear Motion Systems market expansion is favorably impacted by the rising product demand in the healthcare sector for lab testing applications, such as magnetic resonance imaging (MRI), computed tomography (CT) scanners, and X-ray equipment.

Large Expansion Of The Automotive Sector

The Linear Motion Systems market is expected to develop for several other reasons, including the large expansion of the automotive sector and the adoption of several government programs to advance IT infrastructure. Thanks to improvements in automation technologies across the board, packaging operations may now do more with fewer resources. New mechatronic technologies, which integrate the principles of mechanical and electrical engineering to produce more versatile and adaptive machinery, represent the next step. Modern manufacturing facilities in the food and packaging sectors are more efficient because of the use of new materials, production methods, and products with ever-shorter shelf lives, as well as seasonal fluctuations in production volumes and ranges (coated, uncoated papers and wrappers). The production systems exhibit high standards for the final product as well. Strict legal, sanitary, and technological manufacturing requirements must be adhered to. Cleanliness-assured finished items are made possible by equipment and parts that are easy to clean and corrosion-resistant. The primary packaging step, which follows after the production phase, involves several packaging techniques. Links with integrated or separate space-saving buffer systems allow highly effective processes. The utilization of the linear motion system is increasing due to these factors.

Segmental Insights

End-user Insights

The electronics and semiconductor industries utilize linear motion systems in various ways to support their manufacturing processes and equipment. These systems are commonly used in wafer handling, inspection and testing, assembly and packaging, and laser processing, among others.

There are several processes required to create an electronic device, and these processes entail several touches and placement activities that position, align, examine, and other test equipment. Repeated handling and movement during the manufacturing process are critical components that raise equipment damage risk. An automation

system, such as a motion system, is helpful in avoiding risk during the process.

Increased adoption of linear motion systems in the electronics and semiconductor industry is expected to drive the market's growth. Factors like falling production costs, improving fabrication techniques, increasing adoption of automation, growing demand for advanced equipment, and ongoing investments will propel growth in the global electronics and semiconductor industry, thus driving the demand for linear motion systems.

The electronic and semiconductor industries utilize linear motion systems for multiple applications due to the benefits they provide. Smoothness combined with low noise and high-speed capabilities is necessary to meet the demands of the semiconductor industry. The circular ball path enables fast, smooth, and quiet movement, often required by high-value wafer processing equipment.

The miniaturization of the linear motion component in precision measurement and inspection instruments drives the market. The fast growth of electronics, semiconductors, and their peripheral industries uses miniature linear motion components as a major component in their various operations, such as compact precision machinery and robots for the fabrication of high-value computer and office automation products. A linear motion guide is a vital component of the precision automation industry.

Linear motion systems are widely used in the semiconductor industry for various applications. One of their primary uses is in the manufacturing process of semiconductor chips. They play a crucial role in transferring wafers and other materials during production. They ensure that the transfer is smooth, precise, and repeatable, which is critical for producing high-quality, reliable chips. They are also used in semiconductor inspection and testing equipment, where they are used for precision positioning. For instance, wafer inspection equipment relies heavily on linear motion systems to ensure accuracy during scanning and defect detection. The equipment must maintain precise and consistent motion at high speeds, which can only be achieved through the use of high-quality linear motion systems. According to Semiconductor Industry Association (SIA), in 2022, semiconductor sales reached USD 580.13 billion worldwide; it is estimated that semiconductor sales will cross USD 550 billion by mid-2023.

Regional Insights

Asia Pacific Linear Motion Systems market accounted for USD 3.42 billion in 2022 and is expected to exhibit a significant CAGR growth during the study period. In 2022, the region held a share of 43.90% of the overall market. During the assessment period, this regional Linear Motion Systems market is anticipated to increase at a CAGR of 10%. This area has had tremendous growth due to its increasing use of cutting-edge technology, industry activity, and investments in the automotive sector. It also has a few significant Linear Motion Systems market participants. Due to its acceptance rate of motion systems for widespread deployment in the Chinese automotive and electronic industrial industries, China dominates the Asia-Pacific area. India and Japan have enormous development potential due to the Region's rapid expansion. Further, the major countries studied in the market report are The U.S., Canada, Germany, France, the UK, Italy, Spain, China, Japan, India, Australia, South Korea, and Brazil.

Key Market Players

Bosch Rexroth AG

Rollon Spa

Thomas Industries

Schneeberger AG

SKF AB

Nippon Bearing Co. Ltd

Schneider Electric Motion USA

Hepco Motion

Lintech

Bishop-Wisecarver

Report Scope:

In this report, the Global Linear Motion System Market has been segmented into the following categories, in addition to the industry trends which have also been detailed

below:

Global Linear Motion System Market, By Type :

Single-axis Linear Motion System

Multi-axis Linear Motion System

Global Linear Motion System Market, By End-user Industry:

Automotive

Electronics and Semiconductor

Manufacturing

Aerospace, and Healthcare

Global Linear Motion System Market, By Region:

North America

United States

Canada

Mexico

Asia-Pacific

China

India

Japan

South Korea

Indonesia

Europe

Germany

United Kingdom

France

Russia

Spain

South America

Brazil

Argentina

Middle East & Africa

Saudi Arabia

South Africa

Egypt

UAE

Israel

Competitive Landscape

Company Profiles: Detailed analysis of the major companies presents in the Global Linear Motion System Market.

Available Customizations:

Global Linear Motion System Market report with the given market data, Tech Sci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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