

Ball Screw Market Projected to Reach US\$8.0 Billion by 2033, Reports Persistence Market Research

Driven by industrial automation, precision manufacturing, CNC machines, robotics, semiconductor equipment, and EV adoption.

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/EINPresswire.com/ -- The global [ball screw market](#) is projected to be valued at US\$5.1 billion in 2026 and is expected to reach US\$8.0 billion by 2033, expanding at a CAGR of 6.7% from 2026 to 2033. Ball screws are

critical motion-control components that convert rotary motion into precise linear movement while reducing friction and improving efficiency. Market growth is being supported by rising industrial automation, precision manufacturing, CNC machine adoption, robotics, semiconductor equipment production, and the electrification of vehicles. The growing need for high-speed, accurate, and repeatable motion systems is encouraging manufacturers to invest in advanced ball screw assemblies for machine tools, automation systems, medical equipment, and semiconductor manufacturing.

Asia Pacific is expected to remain the leading regional market, supported by its strong manufacturing base, expanding automation investments, and concentration of machine-tool, electronics, semiconductor, and automotive production. China, Japan, South Korea, Taiwan, and other Asian economies continue to invest heavily in advanced manufacturing capacity. Semiconductor equipment is an especially important demand catalyst: SEMI reported that global semiconductor manufacturing equipment sales reached US\$135.1 billion in 2025, up 15% year over year, with China, Taiwan, and Korea together accounting for 79% of global spending.

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Key Highlights from the Report



- The global ball screw market is projected to reach US\$8.0 billion by 2033 from US\$5.1 billion in 2026.
- The market is forecast to expand at a 6.7% CAGR during 2026–2033.
- Industrial automation and precision manufacturing remain major demand generators for ball screw systems.
- CNC machines, robotics, semiconductor equipment, and EV manufacturing are creating new application opportunities.
- Asia Pacific is expected to maintain its leading position due to its strong industrial and electronics manufacturing ecosystem.
- Manufacturers are developing compact, high-speed, low-friction, and thermally stable ball screw technologies.

Market Segmentation

By product type, the market can be divided into ground ball screws and rolled ball screws. Ground ball screws are preferred in applications requiring high positioning accuracy, low backlash, and consistent performance, particularly in precision machine tools, semiconductor equipment, and advanced automation systems. Rolled ball screws offer cost advantages and are widely used where high precision is important but extreme accuracy requirements are comparatively lower.

Based on application, ball screws are used across machine tools, industrial automation, robotics, semiconductor manufacturing equipment, automotive and electric vehicles, medical equipment, aerospace, and other industrial systems. Machine tools represent a significant demand area because CNC equipment depends on precise linear movement for cutting, drilling, milling, and positioning. Meanwhile, robotics and semiconductor equipment are increasing demand for compact and high-speed motion components.

By end user, automotive manufacturers, industrial machinery producers, electronics and semiconductor companies, aerospace manufacturers, and medical equipment companies represent important customer groups.

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Regional Insights

Asia Pacific is positioned as the principal growth region because of extensive manufacturing activity and continued investment in automation, electronics, machine tools, and semiconductor production. China remains a major industrial hub, while Japan contributes through advanced machine-tool and precision-engineering capabilities. Taiwan and South Korea are also important because of their semiconductor manufacturing ecosystems. SEMI reported that semiconductor

equipment spending in 2025 reached US\$49.3 billion in China, US\$31.5 billion in Taiwan, and US\$25.8 billion in Korea.

North America is supported by automation, aerospace, automotive, semiconductor manufacturing, and reshoring initiatives. Demand is particularly relevant for advanced CNC systems, robotics, and high-performance industrial equipment. Europe continues to offer opportunities through automotive engineering, industrial automation, machine tools, medical technology, and high-precision manufacturing, although manufacturers remain focused on controlling production costs and improving energy efficiency.

Market Drivers

Industrial automation is one of the strongest drivers of the ball screw industry. Manufacturers are adopting automated production lines, robotic systems, CNC machinery, and smart manufacturing technologies to improve productivity while reducing manual intervention. Ball screws provide the accurate and repeatable linear movement required by these systems. Rising demand for precision manufacturing is also pushing equipment producers toward low-backlash, high-speed, and high-load-capacity ball screw designs.

The semiconductor industry's rapid expansion is another important driver. Semiconductor manufacturing equipment requires extremely precise positioning, and the continued investment in AI chips, advanced logic, memory, and advanced packaging is increasing demand for precision motion components. The 2025 rise in semiconductor equipment sales demonstrates the scale of this opportunity.

Market Restraints

High manufacturing costs, maintenance requirements, and sensitivity to contamination can restrict ball screw adoption in price-sensitive applications. Precision-ground ball screws require sophisticated production processes and tight quality control, which can increase their cost. Improper lubrication, dust, vibration, and excessive loads can also reduce service life. In addition, alternative linear-motion technologies can compete with ball screws where application requirements favor different designs, creating pressure on manufacturers to improve performance while maintaining competitive pricing.

Market Opportunities

The strongest opportunities lie in developing high-speed, energy-efficient, compact, and maintenance-reduced ball screw assemblies. Demand for smaller machinery is encouraging manufacturers to develop compact nuts and optimized circulation systems, while semiconductor and medical applications are creating opportunities for miniature precision ball screws. Electrification and robotics are also opening new applications requiring accurate motion control.

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Company Insights

- THK
- NSK
- HIWIN
- Bosch Rexroth
- SKF
- Schaeffler
- Tsubaki
- Kuroda Precision Industries

Recent product development illustrates the industry's focus on performance. In July 2025, NSK announced its MT-Frix low-friction ball screw, designed to reduce dynamic friction torque while maintaining nut rigidity, helping lower heat generation and improve machine-tool energy efficiency. In July 2026, Bosch Rexroth expanded its Performance Line ball screw assemblies with new nut types designed for vertical and highly dynamic applications, targeting improved process quality and service life.

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[Automatic Gate Opening System Market](#): Automatic gate opening system market to reach US\$6.2 billion by 2033, expanding at a 7.4% CAGR.

[Deep-Sea Mining Market](#): Deep-sea mining market to reach US\$9.4 billion by 2033, expanding at a 21.5% CAGR.

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