

Sensor Bearings Market: Current Analysis and Forecast (2024-2032)

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Abstracts

The Sensor Bearings Market is witnessing a steady growth rate of 6.16% within the forecast period. The emerging tendency of sensor bearings and high-efficiency bearings across many industries such as automotive, aerospace, and machinery is rising. This booming demand is primarily towards controlling noise and vibration in the most modern applications, such as electric vehicles (EVs) and medical equipment. Also highly regarded in precision machines. The development of sensor bearings that bring sensing capabilities into the bearings to monitor operational parameters like temperature, vibration, and load is accelerating the growth of noise and vibration management, ultimately improving the functionality and reliability of both machinery and vehicles. Real-time monitoring and diagnostics make sensor bearings highly appreciated and lead to superior predictive maintenance and increased service life. These features are crucial in sectors where downtime is costly and safety care. For example, in the electric vehicle industry, sensor bearings are used for drivetrains and wheel hubs to reduce noise while improving component critical longevity and performance. The growing acceptance of electric vehicles and an upsurge in automation in industries such as manufacturing and robotics will also boost the demand for these bearings going forward.

Based on functionality, the sensor bearings market is segmented into speed, temperature, vibration, and displacement. In 2023, the speed segment was the largest in the market and would remain the same even in the forthcoming forecast period. The growth is attributed to the increasing demand for speed monitoring in critical applications such as automotive, aerospace, and industrial machinery, where speed management is crucial for the performance and safety of the systems. Real-time monitoring and control using speed sensor bearings are extremely effective because they supply valuable information that help avert over-speeding or under-speeding conditions of machines and systems. The rise

in the number of electric vehicles and advancements in automotive technology are the primary growth factors for the speed sensor bearing market. For instance, in June 2022, NTN Corporation, a Japanese-based company specialized in manufacturing sensor and other automotive components developed Sensor Integrated Bearing “Talking Bearing™” that incorporates sensors, power generation units, and wireless devices into bearing and wirelessly transmits information on temperature, vibration, and rotational speed. Another segment aiding in the growth of speed sensor bearings is the miniaturization of electronics and increasing automation in industries like robotics and manufacturing, which further emphasizes the need for compactness and precision.

Based on application, the sensor bearings market is segmented into Anti-lock Brake Systems (ABS), electric motors, material handling equipment, and others. The Anti-lock Brake Systems (ABS) segment dominated the market in 2023 and is expected to retain its dominance throughout the forecast period. The growth is attributed to the increased vehicle safety standards and regulations and the burgeoning adoption of electric vehicles globally. As electric vehicles penetrate more in the market, governments around the world are focusing on safety norms to minimize the accidents and fatality. Major regulatory bodies such as European Union and The National Highway Traffic Safety Administration (NHTSA) of United States mandates Anti-lock Braking Systems (ABS) on all new vehicles sold in the United States, meaning all cars must be equipped with ABS to comply with federal safety standards. This has led to an increase in the consumption of sensor bearings in the automotive industry, consequently driving the sensor bearings market. Additionally, several autonomous and semi-autonomous vehicles are available today. They all heavily depend on advanced braking systems which perform a vital role in functioning. ABS is vital for the autonomous vehicle because precisely controlled braking is required to ensure stability, prevent the vehicle from skidding, and avoid accidents. Sensor bearings are very important components of such an ABS, providing crucial data for real-time speed monitoring of the wheels. The growing adoption of self-driving technologies boosted market potential for integrated advanced driver assistance systems (ADAS) and increased demand for sensors bearings along with the need for present ABS.

Based on end-user, the sensor bearings market is segmented into aerospace & defense, automotive, metal & mining, oil & gas, transportation, and others. Among these, the automotive segment dominated the market in 2023 and is

expected to continue leading during the forecast period. Electrifying vehicle technology advancement dominates automotive applications such as electric vehicles (EVs) and advanced driver assistance systems (ADAS), in which sensor bearings become the more critical component to improving vehicle performance, safety, and overall driving experience. There has been an upsurge in the adoption of sensor bearings within the automotive industry owing to their real-time monitoring capabilities of vital parameters such as speed, temperature, vibrations, and displacements in all types of vehicle systems. Examples of systems that require sensor bearings in their application include anti-lock braking systems (ABS), the wheel hub, electric drivetrains, and steering mechanisms, which all require high precision at low levels of noise. The demand for sophisticated safety systems in new vehicles today, for instance such as ADAS, also fosters an increase in demand for sensor bearings in the car industry. Some of the ADAS technologies that demand the use of sensor bearings to track the speed and condition of the critical components of the vehicle include lane-keeping assistance, automatic brakes, and adaptive cruise control. The burgeoning market for sensor bearings can also be linked to the automotive sector's fixation on fuel efficiency and sustainability. Manufacturers adopt sensor bearings in critical components to reduce friction, improve fuel economy, and increase the lifespan of a vehicle's component.

For a better understanding of the market of the sensor bearings market, the market is analyzed based on its worldwide presence in countries such as North America (The US, Canada, and Rest of North America), Europe (Germany, The UK, France, Italy, Spain, Rest of Europe), Asia-Pacific (China, Japan, India, Rest of Asia-Pacific), Rest of World. The Asia-Pacific sensor bearings market is expected to dominate in the forecast period. The rapid industrialization, technological advancement, and rising demand for precision components in many industries are propelling the market. Automotive, electronics, and machinery industries in the region, especially in countries such as China, Japan, South Korea, and India, are attracting growth in this sector. Sensor bearings in China, being one of the main countries in the region, have found a pathway for high growth, being the largest automotive manufacturing hub in the region and a leading manufacturer of electric vehicles. Growth in demand is driven by government policies aimed at furthering EV adoption while reducing emissions and noise pollution, particularly for sensor bearings. The renewable energy sector in the Asia-Pacific region provides another impetus to the growth of the sensor bearings market. With about 180 GW of utility-scale solar and 159 GW of wind power presently on its drawing board, China is watching over the growth of

renewables to cement its leadership worldwide. After an analysis of the current situation in renewables made by Global Energy Monitor (GEM), it was concluded that this double-handed total is adequate to electrify South Korea. Other than provincial subsidies, the market is driven, with many firms choosing sites close to headquarters. For example, battery giant CATL plans to develop its first offshore wind project in Fujian, its home province, to green the energy supply and comply with the EU Battery Regulation. Therefore, with the substantial growth of renewable energy such as wind and solar energy, the demand for sensor bearings is growing in the region for effective and efficient operations. Furthermore, governments in the region are focusing on their economy and trying to make a production-based economy. To boost their manufacturing sectors, many governments in the region have introduced campaigns, such as the "Make in India" initiated by India and "Made in China 2025" in China. Such initiatives often come with subsidies and incentives for adopting newer manufacturing technologies, such as sensor bearings under precision engineering components.

Some of the major players operating in the market include SKF Group, Schaeffler AG, NTN Corporation, The Timken Company, NSK Ltd., Fersa Bearings, Mageba, ABB, NBC Bearings, and Igus.

Contents

1 MARKET INTRODUCTION

- 1.1. Market Definitions
- 1.2. Main Objective
- 1.3. Stakeholders
- 1.4. Limitation

2 RESEARCH METHODOLOGY OR ASSUMPTION

- 2.1. Research Process of the Sensor Bearings Market
- 2.2. Research Methodology of the Sensor Bearings Market
- 2.3. Respondent Profile

3 EXECUTIVE SUMMARY

- 3.1. Industry Synopsis
- 3.2. Segmental Outlook
 - 3.2.1. Market Growth Intensity
- 3.3. Regional Outlook

4 MARKET DYNAMICS

- 4.1. Drivers
- 4.2. Opportunity
- 4.3. Restraints
- 4.4. Trends
- 4.5. PESTEL Analysis
- 4.6. Demand Side Analysis
- 4.7. Supply Side Analysis
 - 4.7.1. Merger & Acquisition
 - 4.7.2. Investment Scenario
 - 4.7.3. Industry Insights: Leading Startups and Their Unique Strategies

5 PRICING ANALYSIS

- 5.1. Regional Pricing Analysis
- 5.2. Price Influencing Factors

6 GLOBAL SENSOR BEARINGS MARKET REVENUE (USD BN), 2022-2032F

7 MARKET INSIGHTS BY FUNCTIONALITY

- 7.1. Speed
- 7.2. Temperature
- 7.3. Vibration
- 7.4. Displacement

8 MARKET INSIGHTS BY APPLICATION

- 8.1. Anti-lock Brake Systems (ABS)
- 8.2. Electric Motors
- 8.3. Material Handling Equipment
- 8.4. Others

9 MARKET INSIGHTS BY END-USER

- 9.1. Aerospace & Defense
- 9.2. Automotive
- 9.3. Metal & Mining
- 9.4. Oil & Gas
- 9.5. Transportation
- 9.6. Others

10 MARKET INSIGHTS BY REGION

- 10.1. North America
 - 10.1.1. The US
 - 10.1.2. Canada
 - 10.1.3. Rest of North America
- 10.2. Europe
 - 10.2.1. Germany
 - 10.2.2. The UK
 - 10.2.3. France
 - 10.2.4. Italy
 - 10.2.5. Spain
 - 10.2.6. Rest of Europe

10.3. Asia-Pacific

10.3.1. China

10.3.2. Japan

10.3.3. India

10.3.4. Rest of Asia-Pacific

10.4. Rest of World

11 VALUE CHAIN ANALYSIS

11.1. Marginal Analysis

11.2. List of Market Participants

12 COMPETITIVE LANDSCAPE

12.1. Competition Dashboard

12.2. Competitor Market Positioning Analysis

12.3. Porter Five Forces Analysis

13 COMPANY PROFILES

13.1. SKF Group

13.1.1. Company Overview

13.1.2. Key Financials

13.1.3. SWOT Analysis

13.1.4. Product Portfolio

13.1.5. Recent Developments

13.2. Schaeffler AG

13.3. NTN Corporation

13.4. The Timken Company

13.5. NSK Ltd.

13.6. Fersa Bearings

13.7. Mageba

13.8. ABB

13.9. NBC Bearings

13.10. Igus

14 ACRONYMS & ASSUMPTION

15 ANNEXURE

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