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Global Fluid Film Journal Bearings Supply, Demand and Key Producers, 2026-2032

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Abstracts

The global Fluid Film Journal Bearings market size is expected to reach $ 5112 million by 2032, rising at a market growth of 8.9% CAGR during the forecast period (2026-2032).
Fluid Film Journal Bearings, as a core rotor support unit in heavy rotating machinery such as steam turbines, gas turbines, generators, and large compressors, the essential value of oil film radial bearings lies in solving the problems of traditional rolling bearings or simple sliding bearings in 'high speed + high load + The long-standing pain points of insufficient fatigue life, uncontrollable vibration and noise, severe wear during start-up and shutdown, and unplanned downtime, high downtime losses, and safety risks in 'long-life' operating conditions?in typical scenarios such as 300MW and above steam turbine generator sets, ethylene cracking/long-distance pipeline compressors, and large blowers?if rolling bearings or poorly designed sliding bearings are used, raceway spalling, cage fracture, or boundary friction failure often occur under long-term high temperature, high speed, and variable load conditions. This not only shortens maintenance cycles and increases total life cycle costs but also amplifies vibration problems caused by rotor imbalance and system resonance. Oil film radial bearings, by establishing a stable full-fluid lubricating oil film between the journal and the bearing bush, transform direct metal-to-metal contact into oil film bearing. During operation, they form a 'liquid spring' with stiffness and damping characteristics, capable of withstanding huge radial loads and a certain amount of axial disturbance, while also attenuating and filtering rotor vibration. This transforms what was originally a 'high-risk part' highly dependent on field experience and frequent maintenance into an engineering module that can be designed, calculated, and monitored according to specifications. In 2025, the global shipment volume of fluid film journal bearings in various application scenarios is approximately 1,885,000 sets. The average purchase price of OEMs, calculated based on the assemblies including the mounting base, is approximately USD 1,450 per

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set. The price will mainly increase with the customization from small equipment to large equipment, and the corresponding gross profit margin is roughly in the range of 26%?34%. Fluid film journal bearings describes radial film bearings as radial sliding bearing assemblies that use a lubricating oil film as the bearing medium to support high-speed rotors. A typical assembly consists of a bearing housing (cast steel/ductile iron), bearing bushes (high-tin Babbitt alloy/copper alloy/aluminum-tin alloy), cylindrical bearings or multiple tilting bearings, oil supply grooves and return channels, labyrinth or combined seals, and temperature/vibration/displacement monitoring interfaces located on the housing. Common parameters include: shaft diameter range of approximately 80?800 mm (120?450 mm is common for large steam turbine generators and long-distance compressors), design specific pressure of 1.5?4.5 MPa, rated speed of 1,500?15,000 rpm (gas turbine-driven compressors and some high-speed units can reach over 20,000 rpm with specialized designs), design oil film thickness of tens to hundreds of micrometers, and a design life typically considered to be 20?30 years, the same as the main unit's life. In terms of typical usage: a 300?600 MW steam turbine generator set is generally equipped with 4?6 sets of fluid film journal bearings and 2?4 sets of thrust bearings; a high-power ethylene compressor or long-distance natural gas compressor unit is usually equipped with 2?4 sets of fluid film journal bearings.
Upstream supply mainly relies on high-quality alloy steel and ductile iron billets, high-tin Babbitt alloys and copper/aluminum-tin alloys, industrial lubricants and additives, precision casting and machining capabilities, and online monitoring sensors; downstream supply is concentrated in large steam turbine and gas turbine plants, power generation equipment and compressor EPC contractors, refining and LNG equipment plants, and OEM clusters providing high-power rotating machinery for the power, petrochemical, and metallurgical industries.
Supply Situation
Upstream raw materials and key components mainly include alloy steel and ductile iron billets for the bearing housing (requiring high strength and good machinability), high-tin Babbitt alloy and copper/aluminum-tin alloy for the bearing bush liner, turbine oil and lubricant additives meeting high temperature and shear conditions, carbide cutting tools and abrasives for finishing, as well as vibration/temperature/displacement monitoring sensors, sealing materials, and fasteners. The combined costs of raw materials and casting/heat treatment/finishing typically account for 60%?72% of the total cost of a fluid film journal bearing. High-tin Babbitt alloy and large-size, high-precision machining have the greatest cost elasticity and significantly impact the gross profit margin of a single project. Typical upstream suppliers include ArcelorMittal, Nippon Steel, Aurubis, Shell, and BASF.
Manufacturer Characteristics
Waukesha has cultivated deep expertise in the North American and Middle Eastern

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refining, long-distance pipeline, and power generation markets for many years, specializing in providing complete sliding bearing solutions for high-power compressors and steam turbines; Miba, leveraging its comprehensive product line and engineering capabilities in power, refining, and marine propulsion bearings in Europe and globally, possesses strong bargaining power in high-end project tenders; Kingsbury, as one of the key originators of tilting pad bearing technology, enjoys high brand recognition and engineering experience in high-load, demanding operating conditions, especially in the field of bearings for large steam turbine generator sets and critical process compressors.

Example

In 2024, a newly built 1,500 MW combined cycle power plant and its supporting seawater desalination project in the Middle East had specific technical requirements for the bearing systems of the turbine generator sets and key auxiliary equipment in the main equipment: the fluid film journal bearings of the main turbine generator section must adopt a multi-tilting pad structure, with a specific pressure capacity of not less than 3.5 MPa, a design speed of 3,000 rpm, and the operating vibration and temperature rise indicators must meet relevant ISO standards and be included in performance evaluation; it is required that vibration, shaft displacement, and metal temperature monitoring interfaces be reserved on the bearing housing, and a 25-year life design certificate and a complete spare parts plan be provided; the key units used for process air compression and seawater transportation are required to adopt a dynamic and static pressure composite fluid film journal bearing to ensure the continuity and reliability of the oil film under low-speed start-up and frequent start-stop conditions. Miba ultimately supplied over 40 sets of fluid film journal bearings and matching thrust bearings for two steam turbine generator sets and multiple key auxiliary machines. They were also responsible for on-site installation guidance, commissioning, and first-year operational data analysis. Bearing vibration and temperature rise parameters were included in the overall machine performance guarantee clauses, becoming one of the important technical foundations for the O&M agreement signed between the EPC contractor and the owner.

Applications

Fluid film journal bearings are widely used in large-scale thermal and nuclear power steam turbine generator sets, gas turbine combined cycle units, process compressors and blowers in oil refining and chemical plants, turbines and compressors in LNG liquefaction and regasification plants, rolling mills and blower systems in the steel and non-ferrous metallurgical industries, large water pumps and seawater desalination units, marine main engines and propulsion shaft systems, as well as ground test benches for aero-engines and various high-power test benches. They are one of the core supporting components in rotating machinery with 'high speed + high load + long life'. Typical

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downstream customers include OEMs and owners such as GE Vernova, Siemens Energy, Mitsubishi Power, MAN Energy Solutions, and Saudi Aramco. They often incorporate fluid film journal bearings into their contracts along with overall machine design, rotor dynamics analysis, and condition monitoring systems through long-term framework agreements with bearing manufacturers or project-based turnkey procurement.

Product Advantages

For downstream turbine/compressor OEMs and power and petrochemical owners, the real advantage of fluid film journal bearings lies not in the 'gross profit per unit,' but in transforming the rotor support problem?which could easily drag down the overall unit's MTBF and availability?into a calculable, verifiable, and monitorable standardized module. Relying on a full-fluid lubricating oil film, fluid film journal bearings exhibit lower friction loss and higher load-bearing capacity than rolling bearings under stable operating conditions. During operation, the fluid film itself provides adjustable stiffness and damping, helping to shift the system's critical speed and resonance range towards a safer direction, significantly reducing vibration and noise in high-speed units. This makes the most critical indicators for owners?such as 'stable operation, long-term operation, and no major accidents'?more controllable. Simultaneously, the design specifications and test database established around parameters such as specific pressure, oil film thickness, temperature rise, and vibration spectrum allow OEMs to quickly select and perform rotor dynamics matching during new model development and unit modification, reducing on-site trial and error and rework, and shortening project delivery cycles. From the owner's perspective, a well-designed radial bearing with online monitoring means a significant reduction in unplanned downtime, extended maintenance cycles, and the ability to recoup substantial bearing and service investments with just one less downtime throughout its lifespan. This transforms the unit from a 'high-failure, high-volume mining truck' into a 'predictable, maintainable cash flow tool.'

Technological Trends

Technological upgrades mainly focus on four directions: First, the deep coupling of fluid dynamics and rotor dynamics. Through 3D CFD + finite element/multibody dynamics joint simulation, the bearing geometry (elliptical, eccentric, multi-tilting pads), oil wedge shape, and oil supply/throttling structure are optimized in an integrated manner. This further reduces friction loss and oil temperature while ensuring sufficient oil film thickness and stability, thereby improving unit efficiency and reducing cooling load. Second, the application of hydrostatic/dynamic pressure hybrid and adjustable stiffness/damping structures is expanded. By switching between hydrostatic support during low-speed/start-stop phases and hydrodynamic support during normal operation, or by adjusting oil supply pressure, throttling clearance, and pad tilt angle, bearing

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performance can adapt to the operating conditions of frequent start-stop, variable load, and even flexible peak-shaving units. Third, monitoring and digital operation and maintenance are embedded in the bearing body design. Temperature, vibration, shaft displacement, and even oil film thickness sensors are reserved or integrated in the bearing housing, combined with online CMS. The platform and digital twin model enable a shift from 'post-incident maintenance' to 'condition-based maintenance and life prediction,' upgrading bearings from passive components to critical sensing nodes. Fourthly, material and process upgrades are implemented. By developing composite Babbitt alloy liners with higher fatigue resistance, scratch resistance, and corrosion resistance, and employing laser cladding, precision welding, and high-precision grinding/scraping processes, reliability and repairability under high-temperature, high-load, and oil-contaminated conditions are improved. The overall trend is to evolve oil film radial bearings from traditional 'static supports' into 'adjustable, sensing, and predictable' system-level components, closely integrated with rotor design, lubrication systems, and maintenance services.

Market Influencing Factors

The market growth of fluid film journal bearings is largely reflected in a combination of 'rigid existing stock + structural incremental growth': On the one hand, the global stock of thermal power and nuclear power units is huge. Even with the slowdown in new thermal power construction, the overhaul, technical upgrade, and life extension projects of existing units continue unabated, ensuring the steady replacement of turbine generator bearings and the demand for spare parts. Gas turbine combined cycle, industrial steam turbines, and distributed energy units are still under construction in some regions, creating incremental space for bearings in small and medium-sized units. On the other hand, investment in high-power compressors and turbine equipment in the refining/chemical, long-distance natural gas transportation, and LNG industry chains continues, especially in the Middle East, North America, and some Asian countries, where a number of large-scale integrated refining and chemical projects and LNG projects have commenced, driving a phased increase in demand for project-based oil film radial bearings. Simultaneously, equipment upgrades in energy-intensive industries such as pumped storage, electrolytic aluminum, and metallurgy are also driving related bearing demand to some extent. In terms of cost and competition, the cyclical fluctuations in the prices of high-tin Babbitt alloys, copper alloys, and high-quality cast and forged materials, coupled with the concentration of large-scale precision machining and assembly capabilities in Europe, America, and parts of Asia, make it difficult for small and medium-sized manufacturers to challenge the technological and pricing dominance of established international brands such as Miba, Kingsbury, and RENK in large-scale, high-end key equipment projects. However, in the fields of medium-pressure and medium-speed units and some general equipment, sliding bearing

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companies in emerging manufacturing bases such as China are continuously penetrating local and regional markets through cost and delivery advantages, forming a tiered pattern where 'high-end key projects are dominated by a few leading companies, while mid-to-low-end and localized demands are undertaken by regional manufacturers.' Overall, fluid film journal bearings do not have the basis for explosive growth in the short term, but with the dual support of 'long-cycle replacement + maintenance of existing units' in power and petrochemical large units, relatively stable rigid demand will be maintained. The high-end market will further concentrate on leading manufacturers with system simulation, testing and verification, and global service capabilities, while competition in the mid-to-low-end and regional markets will revolve around cost, delivery, and local services.

This report studies the global Fluid Film Journal Bearings production, demand, key manufacturers, and key regions.

This report is a detailed and comprehensive analysis of the world market for Fluid Film Journal Bearings and provides market size (US$ million) and Year-over-Year (YoY) Growth, considering 2025 as the base year. This report explores demand trends and competition, as well as details the characteristics of Fluid Film Journal Bearings that contribute to its increasing demand across many markets.

Highlights and key features of the study

Global Fluid Film Journal Bearings total production and demand, 2021-2032, (K Units)

Global Fluid Film Journal Bearings total production value, 2021-2032, (USD Million)

Global Fluid Film Journal Bearings production by region & country, production, value, CAGR, 2021-2032, (USD Million) & (K Units), (based on production site)

Global Fluid Film Journal Bearings consumption by region & country, CAGR, 2021-2032 & (K Units)

U.S. VS China: Fluid Film Journal Bearings domestic production, consumption, key domestic manufacturers and share

Global Fluid Film Journal Bearings production by manufacturer, production, price, value and market share 2021-2026, (USD Million) & (K Units)

Global Fluid Film Journal Bearings production by Type, production, value, CAGR, 2021-2032, (USD Million) & (K Units)

Global Fluid Film Journal Bearings production by Application, production, value, CAGR, 2021-2032, (USD Million) & (K Units)

This report profiles key players in the global Fluid Film Journal Bearings market based on the following parameters - company overview, production, value, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include RENK, Waukesha, Miba, Kingsbury, Wheeler Industries, Michell Bearings, ADMOS, Hunan SUND Technological, GTW, PBW Bearings, etc.

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This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.
Stakeholders would have ease in decision-making through various strategy matrices used in analyzing the World Fluid Film Journal Bearings market
Detailed Segmentation:
Each section contains quantitative market data including market by value (US$ Millions), volume (production, consumption) & (K Units) and average price (US$/Unit) by manufacturer, by Type, and by Application. Data is given for the years 2021-2032 by year with 2025 as the base year, 2026 as the estimate year, and 2027-2032 as the forecast year.
Global Fluid Film Journal Bearings Market, By Region:

United States

China

Europe

Japan

South Korea

ASEAN

India

Rest of World

Global Fluid Film Journal Bearings Market, Segmentation by Type:

Hydrostatic Bearings

Hydrodynamic Bearings

Global Fluid Film Journal Bearings Market, Segmentation by Diameter:

1?

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15?

30?

Others

Global Fluid Film Journal Bearings Market, Segmentation by Load Capacity:

1.5?2.0 MPa

2?3.5 MPa

> 3.5 MPa

Global Fluid Film Journal Bearings Market, Segmentation by Application:

Power Generation

Oil Refineries

Petrochemical

Marine Propulsion Machinery

Aerospace

Others

Companies Profiled:

RENK

Waukesha

Miba

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Kingsbury

Wheeler Industries

Michell Bearings

ADMOS

Hunan SUND Technological

GTW

PBW Bearings

Shenke Slide Bearing

Zhuji Jingzhan

Pioneer

Key Questions Answered:

1. How big is the global Fluid Film Journal Bearings market?
2. What is the demand of the global Fluid Film Journal Bearings market?
3. What is the year over year growth of the global Fluid Film Journal Bearings market?
4. What is the production and production value of the global Fluid Film Journal Bearings market?
5. Who are the key producers in the global Fluid Film Journal Bearings market?
6. What are the growth factors driving the market demand?

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