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Two Wheeler Intercooler Market – Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Type (Air to Air, Water to Air), By Engine Type (Supercharged Engine, Turbocharged Engine), By Design Type (Front Mounted, Top Mounted, Side Mounted), By Region, Competition, 2018-2028

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Abstracts

Global Two Wheeler Axial Flux Motors Market has valued at USD 43 million in 2022 and is anticipated to project robust growth in the forecast period with a CAGR of 5.40% through 2028. The global two-wheeler axial flux motors market is experiencing a significant transformation driven by the growing demand for sustainable and eco-friendly mobility solutions. Electric two-wheelers equipped with axial flux motors have emerged as a promising alternative to traditional gasoline-powered motorcycles and scooters. This shift is primarily influenced by environmental concerns, stringent emissions regulations, and the need for energy-efficient transportation. Axial flux motors, known for their compact design and high efficiency, are at the forefront of this change, providing the essential propulsion technology for electric two-wheelers. One of the key drivers of this market is the increasing awareness of environmental issues and the desire for cleaner transportation options. Governments around the world are introducing regulations to curb emissions and promote electric mobility. As a result, electric two-wheelers with axial flux motors offer an attractive solution, emitting zero tailpipe emissions and contributing to reduced air pollution.

Key Market Drivers

Environmental Regulations and Sustainability Initiatives

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One of the primary drivers of the global two-wheeler axial flux motors market is the increasingly stringent environmental regulations and sustainability initiatives. Governments and regulatory bodies worldwide are imposing strict emission standards to combat air pollution and reduce greenhouse gas emissions. In response, the automotive industry is transitioning toward electric mobility solutions, including electric two-wheelers. Axial flux motors, known for their high efficiency and compact design, are a crucial component of electric two-wheelers. They contribute significantly to reducing emissions and aligning with sustainability goals, making them a preferred choice for manufacturers aiming to comply with these regulations. Furthermore, urban areas are grappling with air quality issues and traffic congestion, leading to growing support for electric two-wheelers as a sustainable and efficient means of transportation. Axial flux motors, with their power-to-weight ratio and regenerative braking capabilities, enhance the overall performance and range of electric two-wheelers, making them a viable alternative to traditional internal combustion engine (ICE) vehicles.

Technological Advancements in Axial Flux Motors

Advancements in axial flux motor technology play a pivotal role in driving the growth of the two-wheeler market. These motors have witnessed significant improvements in recent years, making them more efficient, reliable, and cost-effective. Technological innovations in materials, manufacturing processes, and cooling systems have led to lightweight and durable axial flux motors that can withstand the rigors of daily use in two-wheelers. Furthermore, advances in motor control systems, such as the integration of sophisticated algorithms and sensors, have enhanced the precision and responsiveness of axial flux motors. This results in smoother acceleration, improved energy efficiency, and better overall ride quality for electric two-wheelers. Manufacturers are constantly investing in research and development to push the boundaries of axial flux motor technology, ensuring that they remain competitive and capable of meeting the evolving demands of the market.

Cost Competitiveness and Total Cost of Ownership (TCO)

Electric two-wheelers equipped with axial flux motors are becoming increasingly cost-competitive with their ICE counterparts. While the initial purchase price of an electric two-wheeler may be higher, the lower operating and maintenance costs contribute to an attractive total cost of ownership (TCO). Axial flux motors are known for their efficiency, which results in reduced energy consumption and, consequently, lower charging costs compared to refueling a gasoline-powered vehicle. Moreover, electric two-wheelers

have fewer moving parts and require less maintenance, leading to decreased servicing expenses over their lifespan. Governments and financial institutions in many regions are also offering incentives, subsidies, and favorable financing options for electric two-wheelers, further reducing the upfront costs for consumers. As the cost economics of electric two-wheelers continue to improve, more riders are making the switch from traditional ICE vehicles to electric alternatives, driving market growth.

Rising Consumer Awareness and Demand for Electric Mobility

Consumer awareness of environmental issues, coupled with a growing desire for sustainable transportation options, is fueling the demand for electric two-wheelers with axial flux motors. The global shift towards cleaner and greener modes of transport is driving individuals to consider electric two-wheelers as a practical and eco-friendly alternative to traditional gasoline-powered motorcycles and scooters. Additionally, the convenience and affordability of electric two-wheelers, especially for daily commuting purposes, are appealing to a wide range of consumers. With advances in battery technology, electric two-wheelers equipped with axial flux motors are offering longer ranges and faster charging times, addressing some of the earlier concerns about electric vehicle adoption. As more consumers recognize the benefits of electric two-wheelers in terms of reduced operating costs and lower environmental impact, the demand for these vehicles is expected to continue rising.

Infrastructure Development and Charging Network Expansion

The expansion of charging infrastructure is crucial for the widespread adoption of electric two-wheelers, and it serves as a significant market driver. Governments, private enterprises, and utilities are increasingly investing in the development of charging networks to support the growing electric vehicle market. Fast-charging stations and convenient home charging solutions are becoming more accessible, alleviating range anxiety and making electric two-wheelers more practical for daily use. Furthermore, the integration of smart charging solutions, coupled with mobile apps for locating and accessing charging points, is enhancing the user experience and encouraging the adoption of electric two-wheelers. These developments are particularly beneficial for urban riders who rely on their vehicles for daily commutes and errands. As the charging infrastructure continues to expand, the adoption of electric two-wheelers equipped with axial flux motors is expected to accelerate, particularly in densely populated areas where the need for sustainable urban mobility solutions is most pressing.

Key Market Challenges

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Limited Charging Infrastructure:

One of the primary challenges facing the global two-wheeler axial flux motors market is the limited availability of charging infrastructure, especially in certain regions and urban areas. Electric two-wheelers rely on charging stations for their energy needs, and the scarcity of such facilities can deter potential buyers. In many parts of the world, the development of charging infrastructure has lagged behind the adoption of electric two-wheelers. This results in "range anxiety" for riders, as they fear running out of battery charge without access to a charging point. To overcome this challenge, substantial investments are required to build a comprehensive network of charging stations, including fast chargers for quick replenishment. Governments, utility companies, and private businesses need to collaborate to address this infrastructure gap and encourage electric two-wheeler adoption.

High Initial Purchase Cost

Electric two-wheelers equipped with axial flux motors tend to have a higher upfront purchase cost compared to their gasoline-powered counterparts. While the total cost of ownership (TCO) for electric two-wheelers is generally lower due to lower operating and maintenance costs, the initial price can be a significant barrier for consumers, particularly in price-sensitive markets. To tackle this challenge, manufacturers and governments must work together to incentivize electric two-wheeler adoption. This may include offering subsidies, tax benefits, or financial incentives to reduce the initial purchase price for consumers. Innovative financing options, such as affordable leasing or installment plans, can also help make electric two-wheelers more accessible.

Limited Battery Technology

Battery technology is a crucial aspect of electric two-wheelers, and the current state of battery technology presents challenges to the market. While there have been significant advancements in recent years, including improvements in energy density and charging speeds, there is still room for innovation. Batteries need to become more energy-dense, lightweight, and cost-effective to provide longer ranges and reduce the overall weight of electric two-wheelers. Additionally, the finite lifespan of lithium-ion batteries and concerns about their environmental impact present challenges for recycling and disposal. Developing sustainable battery recycling and disposal processes is necessary to address these concerns.

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Safety Concerns and Regulatory Standards

Safety concerns associated with electric two-wheelers pose challenges for the market. Electric two-wheelers, with their silent operation, can be less conspicuous to pedestrians and other road users, potentially leading to accidents. Furthermore, the high torque and instant acceleration of axial flux motors can catch riders off guard, particularly those transitioning from traditional gasoline-powered vehicles. To mitigate safety concerns, manufacturers must invest in safety features and rider education programs. Governments and regulatory bodies must also establish safety standards specific to electric two-wheelers and enforce them rigorously. These standards should address aspects such as vehicle design, visibility, braking systems, and rider training.

Range Limitations

Electric two-wheelers face range limitations, which can be a challenge, especially for riders who require long-distance commuting or travel. The limited energy storage capacity of current batteries constrains the range of electric two-wheelers, making them less practical for certain use cases. To address this challenge, manufacturers are striving to develop batteries with higher energy densities and more efficient energy management systems. Range extenders, such as removable battery packs or swappable batteries, are also being explored to provide flexibility to riders who need to cover longer distances. However, these solutions need to be implemented at a large scale to make electric two-wheelers more versatile and convenient for a broader range of users.

Key Market Trends

Increasing Adoption of Electric Two-Wheelers

One of the prominent trends in the global two-wheeler axial flux motors market is the increasing adoption of electric two-wheelers. As awareness of environmental issues grows and urbanization continues, consumers and governments are seeking sustainable transportation solutions. Electric two-wheelers, powered by axial flux motors known for their efficiency and compactness, are emerging as a popular choice. They offer a practical and eco-friendly alternative to traditional gasoline-powered motorcycles and scooters. In many regions, government incentives, subsidies, and favorable regulations are encouraging consumers to make the switch to electric two-wheelers. This trend is particularly pronounced in densely populated urban areas, where congestion and pollution are significant concerns. As battery technology advances,

allowing for longer ranges and faster charging times, electric two-wheelers equipped with axial flux motors are becoming more attractive for daily commuting and short-distance travel.

Advancements in Battery Technology

The evolution of battery technology is a critical trend in the global two-wheeler axial flux motors market. Batteries are a central component of electric two-wheelers, and their performance directly impacts the market's growth. Recent advancements in battery chemistry, energy density, and safety have led to improved range, longer lifespan, and faster charging for electric two-wheelers. Lithium-ion batteries have become the standard for electric two-wheelers, allowing for compact designs and higher energy storage. Additionally, research into solid-state batteries and other emerging technologies holds promise for even greater improvements in the future. These advancements enable manufacturers to offer electric two-wheelers with increased range and reduced charging times, addressing some of the early concerns about the practicality of electric vehicles.

Customization and Personalization Options

A growing trend in the global two-wheeler axial flux motors market is the increasing demand for customization and personalization options. Riders are seeking unique and tailored experiences, and manufacturers are responding by offering a variety of models and features to cater to different preferences and needs. Customization options may include various motor power levels, battery capacities, and aesthetic choices such as color schemes and design elements. Additionally, manufacturers are integrating smart features into electric two-wheelers, allowing riders to customize ride settings, connect to smartphones, and access real-time data on battery status and performance. These personalization options enhance the overall ownership experience and attract a diverse range of consumers, from urban commuters to enthusiasts.

Rise of Connectivity and IoT Integration

Connectivity and Internet of Things (IoT) integration are emerging as significant trends in the global two-wheeler axial flux motors market. As electric two-wheelers become more technologically advanced, manufacturers are incorporating IoT features, sensors, and connectivity options to enhance safety, convenience, and user experience. IoT-connected electric two-wheelers can offer features such as GPS navigation, remote diagnostics, anti-theft tracking, and smartphone integration. Riders can access real-time

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information about their vehicle's status, battery charge, and maintenance needs through mobile apps. Moreover, connected electric two-wheelers can contribute to safer riding by providing alerts about road conditions, traffic, and potential hazards. These connectivity features not only improve user experience but also enable manufacturers to gather valuable data for continuous product improvement and predictive maintenance. As consumers increasingly expect these smart features, their adoption in electric two-wheelers equipped with axial flux motors is expected to continue growing.

Rapid Urbanization and Micro mobility Solutions

The trend of rapid urbanization and the growing interest in micro mobility solutions are impacting the global two-wheeler axial flux motors market. As cities become more crowded and congested, there is a greater need for efficient and compact modes of transportation. Electric two-wheelers, particularly e-scooters and e-bikes, offer a solution to last-mile commuting challenges in urban environments. Micro mobility solutions powered by axial flux motors are gaining popularity for short trips and daily commutes. These vehicles are well-suited for navigating congested city streets and can be easily parked and charged in urban settings. As cities promote sustainable transportation and create infrastructure to support micro mobility, the demand for electric two-wheelers, including those equipped with axial flux motors, is expected to rise. Manufacturers are increasingly targeting urban markets with models designed for urban mobility, further fueling this trend.

Segmental Insights

Propulsion Type Analysis

Battery Electric Vehicles, Hybrid Electric Vehicles, and Plug-in Hybrid Electric Vehicles are the three propulsion-based sectors that make up the global automotive axial flux motors market. The battery electric vehicles (BEVs) sector accounts for the biggest share of the global market for automotive axial flux motors. BEVs are cars that only use electric power that is stored in batteries, providing zero-emission travel. The demand for BEVs has risen significantly in recent years due to the increased emphasis on sustainability and environmental issues. Due to the acceptance of electric mobility solutions and government programs supporting clean energy transportation, this market segment now holds a monopoly.

Demand Category Analysis

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The OEM and Aftermarket divisions of the worldwide automotive axial flux motors market are separated based on demand type. The market for axial flux parts and systems that are directly supplied by producers to automotive firms for integration into new cars during the production process is referred to as the OEM segment. The market for axial flux products and services, on the other hand, is available for purchase and installation after the vehicle has been delivered to the end user and is included in the aftermarket category.

Regional Insights

By the end of 2021, Europe held most of the global revenue generated by axial flux motors. The severe measures the government has implemented to encourage the adoption of electric vehicles are the reason for the market's strong expansion in Europe. In March 2020, the UK government reportedly made significant investments in electric scooters and delivery drones as part of the "making journeys easier, smarter and greener" project. The axial flux motor market has great prospects for growth thanks to these global investments. Another element fueling market expansion is the existence of rival companies operating in this sector.

The government's strong initiatives to promote the use of electric vehicles have contributed to the sector's tremendous expansion across Europe. In March 2020, the UK government reportedly spent a sizable sum on electric scooters and delivery drones as part of a program dubbed "making trips easier, smarter, and greener." These international investments will significantly increase the axial flux motor market. Energy-efficient electric motors have the potential to save energy, and nations all over the region are putting strict regulations and policies in place to promote the usage of Axial Flux motors. Axial Flux motors market growth in the region is also discussed in detail, as well as the current effective efficiency criteria in each major market. APAC is renowned for having a rapidly expanding automotive sector, which is being supported by developing nations like China, India, and Japan. The huge market size in APAC is mostly due to the region's strong emphasis on technical improvements, rising disposable income, and rising urbanization. Automotive axial flux technologies find a significant market in this area, drawing both domestic and foreign competitors.

Key Market Players

Magnax BV

YASA Limited

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Nidec Corporation

Saietta Group

EMRAX

Whylot Electromechanical Solutions

Agni Motors Ltd,

Turntide Technologies

Elaphe Propulsion Technologies,

Brusa Elektronik AG

PML Flightlink Ltd.

Report Scope:

In this report, the Global Two Wheeler Axial Flux Motors Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Two Wheeler Axial Flux Motors Market, By Propulsion Type:

BEV

HEV

PHEV

Two Wheeler Axial Flux Motors Market, By Demand Category:

OEM

Aftermarket

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Two Wheeler Axial Flux Motors Market, By Region:

Asia-Pacific

China

India

Japan

Indonesia

Thailand

South Korea

Australia

Europe & CIS

Germany

Spain

France

Russia

Italy

United Kingdom

Belgium

North America

United States

Canada

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Mexico

South America

Brazil

Argentina

Colombia

Middle East & Africa

South Africa

Turkey

Saudi Arabia

UAE

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Two Wheeler Axial Flux Motors Market.

Available Customizations:

Global Two Wheeler Axial Flux Motors 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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