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Automotive Cooling Fan Market Assessment, By Fan Type [Radiator Fan, Condenser Fan, Heating Fan, Others], By Vehicle [Passenger Vehicle, Commercial Vehicle, Others], By Sales Channel [OEM, Aftermarket], By Region, Opportunities and Forecast, 2017-2031F

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Abstracts

Automotive cooling fan market is projected to witness a CAGR of 4.36% during the forecast period 2024-2031, growing from USD 55.96 billion in 2023 to USD 78.73 billion in 2031. The advent of electric vehicles (EVs), along with the efficient usage of fuel, is transforming the use of automotive cooling fans. Furthermore, electric cooling fans, smart and variable-speed fans, and usage of advanced materials are expected to set the latest trends for the market. Electric cooling fans are being preferred over mechanical fans due to their greater efficiency and controllability. Electric fans can be adjusted to deliver cooling as required, resulting in improved fuel efficiency and reduced noise. Advanced control systems are incorporated into cooling fans in the automotive industry. These control systems allow variable speed operation based on the engine's temperature and load. This makes cooling fans more efficient and less power-hungry. Inventors are developing new materials for cooling fans, such as composite and advanced plastics, to reduce weight and improve durability, as well as improve aerodynamics.

As the need for engine efficiency and performance is increasing, thermal management systems (including cooling fans) are being incorporated into other vehicle systems to improve performance and reduce emissions. Rising popularity of electric vehicles and hybrid vehicles continues to grow, so does the need for cooling fan technology. These vehicles necessitate advanced cooling systems to regulate the temperature of the

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battery and electric motor, helping the market expand its boundaries across regions.

Vehicle Electrification and Enhanced Engine Performance to Garner Market Growth

The proliferation of electric vehicles and hybrid electric vehicles enables the implementation of effective cooling systems to regulate the temperature of batteries, electric motors, and power electronics. Compared to conventional internal combustion engine vehicles, electric vehicles typically have more sophisticated and advanced cooling requirements. Engine cooling systems are increasingly in demand due to stringent global emissions regulations and fuel efficiency requirements. Cooling fans play an essential role in maintaining engine operating temperatures, which can lead to reduced emissions and improved fuel efficiency. As manufacturers strive to enhance engine efficiency and performance, the need for efficient cooling systems, such as high-efficiency cooling fan systems, has increased.

For example, Hyundai announced a range of performance upgrades to their Ioniq 5 EV in July 2023, including the addition of larger disc brakes and a more efficient cooling system. Additionally, the company has updated the cooling system by providing a larger cooling area, as well as N-specific packaging for the radiator, a new engine oil-cooler, and a new battery chiller.

Improved Performance and Vehicle Safety to Fuel Market Growth

Cooling fan systems reduce the risk of engine overheating in high-pressure conditions, such as when towing a vehicle or operating at high speeds. The cooling fan market is experiencing growth due to the development of cooling fan technology. The new efficient technology has enabled cooling fans to become quieter and more productive and user-friendly. Additionally, variable-speed cooling fans, intelligent control systems, and advanced materials have contributed to the development of this market. With vehicle safety being a top concern, the need for dependable cooling systems has grown. Furthermore, the automotive cooling fan aftermarket is a significant market, with consumers frequently requiring replacement cooling fans. This market is expected to continue to expand due to the increasing number of vehicles on the road and the associated maintenance costs. Companies are adding new features to have an edge over their competitors.

In September 2023, Denso unveiled a cutting-edge commercial vehicle cooling system called 'Everycool'. This system takes advantage of Denso's extensive knowledge of air-

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conditioning systems, directing the cooling air directly towards the driver, thereby increasing comfort. Compared to conventional cabin-wide cooling solutions, Everycool significantly reduces power consumption, approximately 57 percent.

Energy Efficient Emissions Standards to Increase the Government Support for the Sector

Governments globally have established stringent fuel and emissions regulations for vehicles, which has a direct impact on the development of automotive cooling technologies. Government funding and grants for research and development (R&D), including those related to cooling system innovations, have aided the development of more efficient and eco-friendly cooling technologies. Additionally, various regions have taken steps to encourage the uptake of EVs due to subsidies and development of charging infrastructure. The advent of EVs has also changed the manufacturing of cooling fans. In addition, some governments have provided incentives and subsidies to the development and use of EVs, which are often equipped with advanced cooling systems, thus providing an indirect benefit to the automotive cooling industry. The international organizations, such as International Energy Agency (IEA), United Nations Economic Commission for Europe (UNCEF), and Society of Automotive Engineers (SAE), help the evolving technology touch the ground. The primary objectives of these international organizations are to advance industry standards, promote sustainable transportation, ensure safety, and foster international collaboration in the automotive industry.

Improved Efficiency and Precise Temperature Control to Put Electric Fan on Top

Based on fan type, the electric fan segment is expected to hold the major portion during the forecast period. The factors attributed to the electric fan segment are efficiency and capability. Electric fans are typically more energy-efficient than mechanical fans, as they can be adjusted and regulated to provide cooling as required. This contributes to improved energy efficiency by decreasing the amount of energy consumed by the fan when it is not needed. Electric fans are regulated by the engine management system, enabling precise temperature regulation. They can be activated and deactivated as required to maintain the engine at its optimal operating temperature. Companies are also setting up their manufacturing facilities, specifically covering electric automotive cooling fans.

In May 2023, SPAL automotive parts manufacturer invested USD 35 million in constructing a new American headquarters and manufacturing facility, which is

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anticipated to double the company's workforce.

Regulations Fuels the Passenger Vehicle Segment

Based on vehicle type, the passenger vehicle segment is expected to hold the major portion of the market. The automotive market is dominated by passenger vehicles, which are widely produced and sold around the world. These vehicles are equipped with a variety of cooling systems, such as air conditioning systems and radiators, that can be used to cool the engine and other components. This wide range of applications has led to an increase in the demand for car cooling fans. Additionally, passenger vehicles are often equipped with the most advanced automotive technologies, such as advanced cooling systems, which can lead to more efficient and advanced cooling solutions.

The segment has been a leader in the introduction of electric vehicles and hybrid electric vehicles, which typically require more sophisticated cooling systems for their batteries and motors. This necessitates the development of specialized cooling solutions to meet the needs of these vehicles.

Growing Automotive Industry and Expanded Manufacturing Space to Make APAC the Leading Region

Asia-Pacific is expected to lead the global automotive cooling fan market since the region is home to several major automotive markets, such as China, India, and Japan, as well as South Korea. The significant need for automotive components, such as cooling fans, is increasing in the region with the rising sales of passenger vehicles. Major automotive manufacturers have set up manufacturing facilities in the region, China and India being the most prominent examples. This has led to a significant increase in the number of vehicles produced, which, in turn, has caused a surge in the demand for car cooling fans. The economic growth in Asia-Pacific has enabled more people to purchase personal vehicles, thus leading to an expansion of the passenger car segment and a corresponding increase in the demand for auto cooling fans. The region has seen a significant increase in the adoption of electric H/EVs due to environmental considerations and governmental incentives. EVs and hybrids have intricate cooling requirements, thus increasing the need for sophisticated cooling solutions.

Impact of COVID-19

The COVID-19 has damaged the market through constant supply chain disruptions,

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reduced demand, financial strain, and production halts. Alongside, the limited automotive research and development (R&D) has also impacted the market. The COVID-19 pandemic has had a significant impact on the automotive industry, with several manufacturing and supply chain disruptions. Automobile manufacturers have been forced to temporarily close their manufacturing facilities or operate at reduced capacity to meet the lockdowns imposed by the pandemic, as well as social distancing regulations. As a result, automotive components, such as cooling fans, have seen a decrease in demand and production due to the economic uncertainty and decreased consumer confidence associated with the pandemic. This has resulted in a decrease in vehicle sales, with many prospective buyers either postponing or cancelling their vehicle purchases.

Impact of Russia-Ukraine War

The Russia-Ukraine war had an adverse impact on the automotives and components market. Russia and Ukraine have become major players in the international raw material supply chain. Although they are not the primary suppliers of automotive cooling systems raw materials, they are involved in producing a variety of materials utilized in the automotive sector. Apart from the raw materials, the currency exchange prices have also been affected through these things. Currency fluctuations can impact the cost of imports or exports of automotive components, which can potentially affect the price and availability of cooling fans on the global market.

Key Player Landscape and Outlook

The competitive landscape for the global automotive cooling fan market is focused on advanced technologies. Companies focus on efficient, easy to integrate, and usage of different metals. The cooling fan manufacturers also try to optimize the high performance with lower dynamics for their cooling fans. Advanced electric fans with better integration into the engine units are being developed. Therefore, the vendors use LED technology in these adaptive lights to make them effective in night-time driving. Furthermore, the key players use strategies like collaboration, acquisition, and partnerships to strengthen their supply chain and distribution channel. Competitors also use these strategies to facilitate services in areas where they don’t have their presence.

In October 2023, KOITO MATERIALING Co., Ltd. and KONSO CORPORATION have agreed to collaborate on the development of a system to enhance the object recognition performance. The lighting is expected to integrate with vehicle imaging sensors by

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coordinating lamps to enhance driving safety at night.

In July 2022, Continental Automotive GmbH introduced the battery cooling fan coverage for the hybrid vehicles, covering companies like Ford, GM, Honda, Hyundai, Kia, and Toyota. The cooling fans for hybrid vehicles are expected to maintain good health for the vehicle battery and overall fuel economy.

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*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work

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