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Thermal Systems Market by Application (Front & Rear A/C, Powertrain, Seat, Steering, Battery, Motor, Power Electronics, Waste Heat Recovery, Sensor), Technology, Components, Vehicle (ICE, Electric, Off-Vehicle & ATV) and Region - Global Forecast to 2027

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Abstracts

The thermal systems market is projected to grow from USD 37.6 billion in 2022 to USD 41.7 billion in 2027, at a CAGR of 2.1%. The market has a promising growth potential due to several factors, such as stringent emission norms across various countries, which would create the importance of powertrain thermal management. The growing demand for premium cars with increased comfort features would require thermal management. Lastly, rising electric vehicle vehicles require effective thermal management for batteries, motors, and other power electronics modules.

With the rising demand for luxury cars, especially high-end full-size SUVs, several thermal systems such as heated steering, heated/ventilated seats, automatic climate control, and rear air conditioning have evolved in terms of technology, comfort, and safety. For instance, to provide sufficient cooling to third-row passengers, OEMs are installing separate rear A/C units in full-size SUVs, and with growing demand, the market for rear-seat air conditioning will also grow. Increasing demand for luxury vehicles would drive the need for advanced thermal systems and features, such as grille shutters, passive cabin ventilation, active cabin ventilation, active seat ventilation, and glass or glazing, which currently have very low penetration.

'Battery Electric vehicles segment would lead the electric & hybrid vehicle thermal systems market.'

Stringent emissions regulations have shifted the global focus on electric vehicles, which

has resulted in exponential growth of these vehicle types in recent years. An increase in electric vehicle sales has spurred the demand for electric components such as electric compressors, batteries, electric motors, power electronics, and heat exchangers. Also, demand for a higher driving range and fast charging has made battery and motor thermal management an important aspect of electric vehicles. Further, according to a survey of BEV architectures, the industry has been experimenting with combinations of different thermal management concepts such as pre-conditioning of the cabin, air coolant and refrigerant-cooled batteries, heat pumping, collection, and re-use of waste heat, etc. Thus, growing electric vehicles sales would fuel the thermal systems market in the coming future

'Waste heat recovery technology to grow at the fastest rate during the forecast period'

Waste heat recovery will be the fastest growing segment under the review period owing to increasing emission regulation stringency, especially in Western Europe and North America. European countries, Turkey, and Israel have made the 'Worldwide Harmonized Light Vehicle Test Procedure (WLTP)' mandatory, which helps to achieve reduced emissions and increased fuel efficiency. Some other countries are expected to join this program in the future, which may fuel the adoption of EGR technology, mainly for compact engines in the years to come. This would create a growth opportunity for using Exhaust gas recirculation (EGR) and Thermoelectric Generator (TEG) in the coming year and bring new business opportunities for thermal system providers

Europe is estimated to be the second largest market for thermal systems market

Europe accounted to be the second largest market for thermal systems. The region has a higher demand for passenger cars, particularly for premium cars (C segment and above). These premium cars are installed with efficient engine cooling, transmission cooling, waste heat recovery systems, advanced HVAC system, heated/ventilated seats, heated steering, etc. These emit less harmful gases, offer enhanced performance, and provide superior cabin comfort to the passengers. With increasing premium car sales, the region's demand for thermal systems is expected to grow. Further, electric & hybrid vehicles also seen a considerable adoption rate in Europe.

According to the Global Electric Vehicle Outlook 2022 publication by IEA, Europe recorded EV sales of 2.3 million units in 2021, with robust growth of about 65% against 2020. Increasing EV sales would positively impact battery thermal and motor thermal management systems. The growing demand for the thermal system will be sufficed by major regional suppliers such as Valeo (France), MAHLE GmbH (Germany), and AKG

Group (Germany).

In-depth interviews were conducted with CEOs, marketing directors, other innovation and strategy directors, and executives from various key organizations operating in this market.

By Company Type: OEMs –25%, Tier 1 – 65% and Tier 2 – 10%

By Designation: C Level Executives - 15%, Directors - 20%, and Others – 65%

By Region: Asia Pacific - 50%,Europe – 15%, North America – 30%, RoW- 5%

Denso Corporation (Japan), MAHLE GmbH (Germany), Hanon Systems (South Korea), Valeo SA (France), and BorgWarner Inc. (US) are the leading providers of thermal systems in the global market.

Research Coverage:

The thermal system market is segmented based on application (ICE) (engine cooling, front air conditioning, rear air conditioning, transmission system, heated/ventilated seats, heated steering, waste heat recovery vehicle), vehicle type (passenger car, LCV, truck, and bus), application (Electric and Hybrid Vehicle) (battery thermal system, transmission system, engine cooling, front air conditioning, motor thermal management, power electronics, rear air conditioning, heated/ventilated seats, heated steering, and waste heat recovery) , electric & hybrid vehicle type (BEV, PHEV, FCEV, and 48V mild hybrid), technology (ICE) (active transmission warm up, exhaust gas recirculation, engine thermal mass reduction, reduced HVAC system loading, and other technologies), Component (ICE) (air filter, condenser, compressor, water pump, motor, heat exchanger, heater control unit, thermoelectric generator, electric compressor, electric water pump, EGR valve, A/C valve, oxygen sensor, temperature sensor, and charge air cooler), Component (Electric and Hybrid Vehicle) (air filter, condenser, electric compressor, electric water pump, electric motor, heat exchanger, heater control unit, and thermoelectric generator), Off-highway vehicle by equipment (construction &mining equipment, and farm tractors) , ATV by region (North America, Europe, Asia Pacific, and Rest of the world) and region (Asia Pacific, Europe, North America, and the Rest of the World).

The study also includes an in-depth competitive analysis of the major thermal systems

product manufacturers in the market, their company profiles, key observations related to product and business offerings, recent developments, and key market strategies.

Key Benefits of Buying the Report:

The report will help the market leaders/new entrants in this market with the information on the closest approximations of the revenue numbers for the overall automotive thermal systems market and the sub-segments. This report will help stakeholders understand the competitive landscape and gain more insights to better position their businesses and plan suitable go-to-market strategies. The report also helps stakeholders understand the market's pulse and provides information on key market drivers, restraints, challenges, and opportunities.

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