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Thermal Management Market by Material, Device (Conduction Cooling Devices, Convection Cooling Devices), Service (Installation & Calibration, Optimization & Post-sales Support), End-user Industry and Region – Global Forecast to 2028

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Abstracts

The global thermal management market was valued at USD 10.7 billion in 2022 and is projected to reach USD 19.3 billion by 2028, registering a CAGR of 9.7% from 2023 to 2028. When temperatures get too high, it is necessary to wick the heat away from the components through heat-dissipating devices, such as a liquid cooling plate, chassis, or traditional heat sink. For instance, if a printed circuit board (PCB) does not have a way to transfer heat, the reliability and longevity of its components will be adversely affected. In extreme cases, they can even melt or get damaged. Owing to these factors, heat dissipation solutions are used as thermal management components.

“Material Type: Non-adhesive materials segment is expected to witness highest CAGR in thermal management market during forecast period“

The non-adhesive materials segment is expected to record the highest CAGR of 9.8% during the forecast period. This growth is attributed to the wide use of non-adhesive materials such as thermal pads, gap fillers, and grease in consumer electronics such as computers, laptops, and other handheld devices, including tablets. Non-adhesive materials are also very proficient in handling mechanical shocks and absorption, providing more security and reliability to users. Thermal pads or other applicants, such as gap fillers, can structure their physical characteristics according to the requirements of electronic devices. Thermal pads are easily compressible to accommodate different profile heights of multiple components and remain stress-free while offering outstanding mechanical shock absorption. Though the conduction of heat by thermal pads is lesser

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effective than a minimal amount of thermal grease, these pads are widely used as they are clean and generally easy to install.

“Advanced cooling devices segment to register highest CAGR in thermal management market from 2023 to 2028”

The advanced cooling devices segment is anticipated to record the highest CAGR of 12.8% during the forecast period. Advanced cooling devices, such as cold plates, are used in several thermal management applications, including heating, ventilation, air conditioning (HVAC), temperature calibration, and control. Increasing R&D investments to carry out technical advancements in thermal management solutions and systems, including the development of thermal protection materials for space reentry vehicles and the incorporation of nanoscale heat transfer in next-generation electronic devices, are leading to the growth of the advanced cooling devices segment of the thermal management market across the world. Moreover, these advanced cooling devices are widely used in various types of computers, ranging from laptops to supercomputers and are embedded with heat pipes to prevent overheating. These factors are contributing to the growth of the thermal management market.

“Optimization & post-sales support service type segment is estimated to witness the highest CAGR of thermal management market between 2023 and 2028”

The optimization & post-sales support service type segment accounted for the largest market share of ~59% in 2022 and is expected to witness the highest CAGR of 10.5% during the forecast period. An effective post-sales process will ensure the client's satisfaction with the product and overall experience. Also, this will allow the manufacturer to understand where the process is thriving and needs improvement. These are some key factors contributing to the rising demand for optimization & post-sales support services.

“Automotive end-user industry segment is expected to record highest CAGR in thermal management market during forecast period”

The automotive end-user industry is expected to witness the highest CAGR of 11.1% during the forecast period. The increasing use of electric vehicles (EVs), which enable e-mobility and compliance with CO_2 emission regulations, is driving the growth of the automotive segment in the market. In the automotive industry, thermal management of HVAC systems, instrument panels, infotainment systems, satellite navigation systems, head-up displays, and engine and brake management systems is essential.

“North American market is estimated to grow at second-highest CAGR during forecast period”

The North American market is expected to grow at the second-highest CAGR of 8.1% during the forecast period. The growth in the region is attributed to the significant presence of numerous players in the ecosystem, such as Honeywell International Inc., Vertiv Co, Parker Chomerics, Boyd, LORD Corporation, API Heat Transfer, Advanced Cooling Technologies, Inc., Master Bond Inc., and ThermoTek.

Breakdown of Primaries

The study contains insights from various industry experts, ranging from component suppliers to tier-1 companies, and original equipment manufacturers (OEMs). The break-up of the primaries is as follows:

By Company Type - Tier 1 – 45%, Tier 2 – 30%, Tier 3 – 25%

By Designation— C-level Executives - 35%, Managers - 30%, Others - 35%

By Region—North America - 30%, Asia Pacific - 40%, Europe - 20%, RoW - 10%

The thermal management market is dominated by a few globally established players, such as Henkel (Germany), Honeywell International Inc. (US), Vertiv Co (US), Delta Electronics, Inc. (Taiwan), Parker Chomerics (US), TAT Technologies Ltd. (Israel), Autoneum Holding AG (Switzerland), Boyd (US), European Thermodynamics Ltd. (UK), and Laird Thermal Systems (US). The study includes an in-depth competitive analysis of these key players in the thermal management market, with their company profiles, recent developments, and key market strategies.

Research Coverage:

The report segments the thermal management market and forecasts its size based on segments, namely, material, device, service type, end-user industry, and region. Based on region (North America, Asia Pacific, Europe, and RoW), Material (Adhesive Materials, Non-Adheive Materials), Device (Conduction Cooling Devices, Convection Cooling Devices, Advanced Cooling Devices, Hybrid Cooling Devices), Service Type (Installation & Calibration, Optimization & Post-sales Support), End-user Industry

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(Consumer Electronics, Servers & Data Centers, Automotive, Aerospace & Defense, Enterprises, Healthcare, Other End-user Industries). The report also provides a comprehensive review of market drivers, restraints, opportunities, and challenges in the thermal management market.

Key Benefits of Buying the Report:

The report will help the leaders/new entrants in this market with information on the closest approximations of the revenue numbers for the overall market and the subsegments. 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 pulse of the thermal management market and provides them with information on key market drivers, restraints, challenges, and opportunities.

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