Thermal Management Technologies - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts 2019 - 2029

Market Report | 2024-02-17 | 100 pages | Mordor Intelligence

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Report description:

The Thermal Management Technologies Market size is estimated at USD 12.62 billion in 2024, and is expected to reach USD 18.80 billion by 2029, growing at a CAGR of 8.30% during the forecast period (2024-2029).

The electronic packaging trend has resulted in increased performance and reduced product sizing. This has led to a significant increase in power consumption, which, in turn, demands thermal management for good system performance and reliability by removing the high heat flux generated by electronic devices.

Key Highlights
-Significant growth in the electronics industry worldwide is one of the key factors driving market growth. There is an increasing demand for miniaturized devices with enhanced power densities, with improvements in the manufacturing technologies of consumer electronics. This, in turn, positively impacts the demand for thermal management technologies to minimize the high heat flux generated by these devices.
-Over the past few years, chip-cooling solutions have evolved to accommodate the increase in heat flux. Many manufacturers are working on the development of advanced cooling solutions based on multi-phase heat transfer technologies. Technologies like jet impingement mechanisms, cold plates, and heat vapor chambers have transformed the future of these systems.
-Also, the increasing adoption of renewable energy resources is the major factor driving the thermal energy storage market. In addition, rapid industrialization across the world has increased the need for continuous power supply, which positively leads to the overall thermal energy storage market growth during the forecast period.
-However, due to the use of various transistors, the design complexities in components used in thermal management, specifically in electronic devices, are restraining the market's growth.
-One of the most common applications of thermal management technologies is in consumer electronics. At the onset of the

pandemic, the consumer electronics industry faced a heavy headwind due to supply chain disruptions. However, with an increase in demand for virtual learning, remote work, and media consumption brought about by the pandemic, the demand for many consumer electronics devices, such as tablets and laptops, has experienced significant growth in recent times, which is expected to accelerate the market demand.

Thermal Management Technologies Market Trends

Increasing Demand for Consumer Electronics will Enhance the Market Growth

- Due to developments in the electronics industry, the introduction of smaller and smarter products are increasing. These advancements in the industry have led to an increased need for innovative thermal management technologies to improve system performance and reliability by eliminating the heat generated by devices.
- The smartphone and tablet material market has witnessed considerable growth in the past decade. Due to the sensitivity toward weight and costs, the said market is expected to rely mostly on advanced materials for cooling solutions rather than secondary heat sinks.
- Further, owing to the increasing adoption of the Internet of things (IoT), the technology that enables the communication between things or between things and people using the Internet and IP-enabled protocols, the number of connected devices has been rising rapidly in recent years. For instance, as per Cisco, there will be 29.3 billion networked devices by 2023.
- Most IoT devices (wearables, smart home systems, etc.) carry such small form factors that active thermal management strategies (cooling fans or liquid cooling) cannot be implemented. In these products, implementing passive thermal management techniques at the board level alongside circuit optimization is key to preventing overheating of critical components.
- Further, with the increasing penetration of 5G in recent years, the demand for 5G-enabled devices, such as smartphones, is increasing. Such devices contain a greater density of high-power components in smaller spaces. This increased power requires more energy consumption, which generates more heat. As a consequence, there is an increased need for thermal management in such devices.

North America to Hold Major Share

- The North American region is expected to account for the largest market share, attributed to the increasing investments in technological innovation and adoption of thermal management technologies by various domains. Some of the prominent players in the market, such as Parker-Hannifin Corp, Advanced Cooling Technologies Inc., Honeywell International Inc., and Gentherm Inc., are headquartered in this region.
- The proliferating consumer electronics industry in the region is one of the primary factors driving the market's growth. According to a recent forecast from CTA, the consumer technology industry in the United States is projected to generate over USD 505 billion in retail sales revenue for the first time. The projection represents a 2.8% revenue increase from the impressive growth of 9.6% in 2021 over 2020. As per the organization, strong demand for smartphones, automotive tech, health devices, and streaming services will help propel a significant portion of the projected revenue.
- The automotive industry's transition toward electrification is also fueling the demand for the market. Thermal management in EVs (electric vehicles) powered by batteries is essential as it affects the performance, reliability, and robustness of these vehicles.
- The United States is one of the largest markets for electric vehicles, and the country has also recorded rapid growth in EV sales in recent years. For instance, as per the United States Department of Energy, EV sales grew by 85% from 2020 to 2021, while plug-in hybrid electric vehicles (PHEVs) more than doubled in 2021, with an increase of 138% over the previous year.
- Many regulations have also been implemented in recent years to promote the use of electric vehicles in the country. For

instance, in April 2021, New York state lawmakers passed a bill that would essentially mandate that all new passenger cars sold in the state run on electric power by 2035. Moreover, the United States has set a target to ensure half of the vehicles sold in the country are electric by 2030.

Thermal Management Technologies Industry Overview

The thermal management technologies market is significantly fragmented, with no player accounting for a significant market share. Also, the number of local players is increasing in this market, resulting in increasing competition.

In January 2022 - Parker Lord, a division of Parker Hannifin, expanded its portfolio of products for electric vehicle manufacturers to include new thermally conductive adhesives and one-component (1K) low-density gap fillers to support their product offering of thermal management encapsulants, adhesives, and gap fillers.

In June 2021 - Gentherm announced that it had emerged as the lead investor in a seed round of financing in Israel-based Carrar, a technology developer of advanced thermal management systems for the electric mobility market.

Additional Benefits:

- The market estimate (ME) sheet in Excel format
- 3 months of analyst support

Table of Contents:

5 MARKET SEGMENTATION
5.1 By Product Type
5.1.1 Software
5.1.2 Hardware
5.1.3 Substrate
5.1.4 Interface
5.2 By Application
5.2.1 Computers
5.2.2 Consumer Electronics
5.2.3 Automotive Electronics
5.2.4 Telecommunication
5.2.5 Renewable Energy
5.2.6 Other Applications
5.3 Geography
5.3.1 North America
5.3.2 Europe
5.3.3 Asia Pacific
5.3.4 Rest of the World

6 COMPETITIVE LANDSCAPE
6.1 Company Profiles
6.1.1 Parker-Hannifin Corp.
6.1.2 Advanced Cooling Technologies Inc.
6.1.3 Honeywell International Inc.
6.1.4 Gentherm Inc.
6.1.5 Autoneum Holding AG
6.1.6 Sapa Extrusions Inc.
6.1.7 AllCell Technologies
6.1.8 Thermacore Inc.
6.1.9 Laird Technologies Inc.
6.1.10 Pentair Thermal Management
6.1.11 Outlast Technologies LLC

7 INVESTMENT ANALYSIS

8 FUTURE OF THE MARKET

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