

Global Solid State Cooling Market Size study & Forecast, by Product (Refrigeration Systems, Cooling Systems) by Type (Single Stage, Multi-Stage) by End-use (Consumer Electronics, Healthcare) and Technology and Regional Forecasts 2022-2032

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Abstracts

The Global Solid State Cooling Market is valued approximately at USD 0.78 billion in 2024 and is anticipated to expand at a robust CAGR of 6.20% over the forecast period 2025-2035. Solid state cooling systems leverage thermoelectric, magnetocaloric, and electrocaloric technologies to provide energy-efficient cooling solutions, eliminating the need for traditional refrigerants and moving parts. These systems are increasingly adopted across consumer electronics, healthcare, and industrial sectors due to their compact design, precise temperature control, and eco-friendly operation. Market growth is primarily driven by the rising demand for portable and energy-efficient cooling devices, coupled with increasing investments in sustainable technology solutions worldwide.

The accelerated adoption of green and low-noise cooling technologies has led to heightened demand for solid state cooling solutions. These systems are critical in applications ranging from personal electronic devices to sensitive medical equipment, where precise thermal regulation is paramount. According to industry reports, the global consumer electronics segment witnessed substantial growth in 2023, further propelling the requirement for reliable cooling mechanisms. Additionally, advancements in multi-stage thermoelectric modules and integration with IoT-based temperature monitoring systems are opening lucrative avenues for market players. However, the relatively high manufacturing cost and technical complexity of solid state cooling devices may act as moderate growth restraints over the forecast period.

The detailed segments and sub-segments included in the report are:

By Product:

Refrigeration Systems

Cooling Systems

By Type:

Single Stage

Multi-Stage

By End-use:

Consumer Electronics

Healthcare

By Technology:

Thermoelectric

Magnetocaloric

Electrocaloric

By Region:

North America

U.S.

Canada

Europe

UK

Germany

France

Spain

Italy

ROE

Asia Pacific

China

India

Japan

Australia

South Korea

RoAPAC

Latin America

Brazil

Mexico

Middle East & Africa

UAE

Saudi Arabia

South Africa

Rest of Middle East & Africa

Refrigeration systems are expected to dominate the market due to their extensive application across consumer electronics and healthcare sectors, where precise temperature control and compact design are critical. The segment benefits from technological enhancements in solid state modules, which improve efficiency, reduce power consumption, and enable integration into portable devices. The increasing reliance on refrigeration systems in medical diagnostics and electronic cooling further solidifies this segment's leading position.

Thermoelectric technology currently leads revenue contribution within the solid state cooling market. Thermoelectric systems are widely preferred for their scalability, minimal maintenance requirements, and superior environmental compliance compared to traditional cooling methods. This technology has witnessed rapid adoption in both single-stage and multi-stage configurations, particularly in high-precision applications such as laboratory equipment, medical devices, and consumer electronics, thereby generating substantial revenue for market players.

North America accounted for the largest market share in 2025, driven by the presence of advanced electronics and healthcare infrastructure, high R&D spending, and early adoption of energy-efficient cooling technologies. Europe maintains steady growth owing to stringent environmental regulations and increasing deployment in medical and industrial applications. Asia Pacific is projected to exhibit the fastest growth during the forecast period, fueled by the surging demand for consumer electronics, rising healthcare infrastructure investment, and proactive government initiatives supporting sustainable cooling technologies in countries such as China, India, and Japan.

Major market players included in this report are:

Gentherm, Inc.

Laird Thermal Systems

Phononic, Inc.

II-VI Incorporated

Marlow Industries, Inc.

TE Technology, Inc.

Tellurex Corporation

RMT Ltd.

Ferrotec Corporation

CUI Devices, Inc.

Melcor, Inc.

Cryopak, Inc.

Sunpower, Inc.

CoolTech Applications

Thermonamic Electronics

Global Solid State Cooling Market Report Scope:

Historical Data – 2023, 2024

Base Year for Estimation – 2024

Forecast period – 2025-2035

Report Coverage – Revenue forecast, Company Ranking, Competitive

Landscape, Growth factors, and Trends

Regional Scope – North America; Europe; Asia Pacific; Latin America; Middle East & Africa

Customization Scope – Free report customization (equivalent to up to 8 analysts' working hours) with purchase. Addition or alteration to country, regional & segment scope*

The objective of the study is to define market sizes of different segments & countries in recent years and to forecast the values for the coming years. The report is designed to incorporate both qualitative and quantitative aspects of the industry within the countries involved in the study. The report also provides detailed information about crucial aspects, such as driving factors and challenges, which will define the future growth of the market. Additionally, it incorporates potential opportunities in micro-markets for stakeholders to invest, along with a detailed analysis of the competitive landscape and product offerings of key players. The detailed segments and sub-segments of the market are explained below:

Key Takeaways:

Market Estimates & Forecast for 10 years from 2025 to 2035.

Annualized revenues and regional-level analysis for each market segment.

Detailed analysis of the geographical landscape with country-level analysis of major regions.

Competitive landscape with information on major players in the market.

Analysis of key business strategies and recommendations on future market approach.

Analysis of the competitive structure of the market.

Demand side and supply side analysis of the market.

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