

Solid-State Cooling Market by Product (Refrigeration System and Cooling System), Type (Single Stage, Multi Stage, and Thermocycler), End-User Industry (Automotive, Semiconductor and Electronics, Healthcare, Consumer), Region - Global Forecast to 2024

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Abstracts

“OVERALL SOLID-STATE COOLING MARKET TO GROW AT CAGR OF 10.2% FROM 2019 TO 2024”

The global solid-state cooling market is estimated to be valued at USD 395 million in 2019 and is projected to reach USD 641 million by 2024, at a CAGR of 10.2%.

Major factors driving the solid-state cooling market growth include growing awareness of green energy and increasing focus on curbing greenhouse gas emissions, simultaneous heating and cooling properties of solid-state cooling systems and rising demand for precise temperature control and below ambient cooling and expanding solid-state cooling applications in industries such as healthcare, automotive, semiconductor and electronics. However, higher costing than conventional cooling and refrigeration systems is one of the key factors restraining the growth of the market.

“COOLING PRODUCT SYSTEMS ARE TO HOLD LARGEST SHARE OF SOLID-STATE COOLING MARKET BY 2024”.

The cooling systems are used in wide applications; e.g., in various government aerospace agencies, air conditioned cases are used for laser telescope and data tracking equipment protection. The use of such solid-state cooling systems in a wide

range of applications such as cooling electronic cabinets, computer enclosures, electrical enclosures, instruments, telecommunication equipment, and many other industrial applications in a variety of environments is a major reason for the largest share in the market. Solid-state air cooling system is further sub divided into 2 types—air conditioners and chillers. Solid-state thermoelectric air conditioners are compact, lightweight units used for cooling electronic cabinets, computer enclosures, electrical enclosures, instruments, telecommunication equipment, and many other industrial applications in a variety of environments. These air conditioners have a simple and efficient solid-state design that uses the Peltier effect to provide reliable performance without the use of harmful chlorofluorocarbons (CFCs). Solid-state thermoelectric chillers also work on the Peltier effect principle. These thermoelectric chillers have multiple arrays of thermoelectric chips or modules that are coupled with liquid heat exchangers, fans, and heat sinks to provide accurate temperature control of products kept inside. The main advantage of using thermoelectric modules or chips is it has the ability to cool and heat. Due to this ability, these solid-state chillers provide extremely fast and accurate temperature control, along with stability, and can reach temperature stability of just a few 0.001°C with a stable heat load.

“SINGLE STAGE TO ACCOUNT FOR LARGEST SHARE OF SOLID-STATE COOLING MARKET, BY TYPE”

Single-stage cooling systems are effective from a few mW to a few hundred watts of cooling power. Single-stage thermoelectric module family is suitable for a wide range of cooling and heating applications with low to high heat pumping capacities (depending on the module model).

Single-stage modules are the most common type of thermoelectric modules globally because they are suitable for a wide range of heating and cooling applications, which require medium or high heat pumping capacity. A standard single-stage thermoelectric cooling module is capable of achieving a maximum no-load temperature differential of approximately 65–70°C. The more heat moved using a thermoelectric module, the less efficient it becomes because the thermoelectric module needs to dissipate both the heat being moved and the heat it generates from its own power consumption. The amount of heat that can be absorbed is proportional to the current and time. Single-stage modules can create systems that are effective from a few mW to a few hundred watts of cooling power. Single-stage thermoelectric module family is suitable for a wide range of cooling and heating applications with low to high heat pumping capacities (depending on the module model). Typical applications for these standard TECs include biomedical instruments, consumer products, industrial equipment, electrical equipment, and

laboratory and scientific instruments. A single-stage module consists of one matrix of pellets and a pair of cold and warm sides. These modules are used in thermal reference sources for FLIR camera calibration, temperature stabilization of bolometers and ferroelectric detectors, laser diode arrays in fiber optic systems, and maintaining constant viscosity in ink jet printers. Single-stage thermoelectric modules are suitable for medium to low heat pumping capacity requirements. Moreover, single stage thermoelectric modules are used in consumer electronics, biomedical instruments, electrical equipment and laboratory, industrial equipment, and scientific instruments.

“APAC TO WITNESS SIGNIFICANT CAGR IN SOLID-STATE COOLING MARKET DURING FORECAST PERIOD”

APAC is expected to continue to lead the solid-state cooling market and is also likely to be the fastest-growing region. Increased demand for consumer goods, industrial automation, and healthcare monitoring devices is expected to drive this market. With the use of solid-state cooling systems, higher efficiency levels, and energy harvesting can be achieved in this region. Growing industrialization and infrastructural developments, and stringent government regulations pertaining to energy sustainability are among the major drivers of this market. Therefore, the solid-state cooling market in APAC is likely to grow at the highest CAGR during the forecast period.

Break-up of the profiles of primary participants:

By Company Type: Tier 1 = 25%, Tier 2 = 50%, and Tier 3 = 25%

By Designation: C-Level Executives = 25%, Directors = 50%, and Managers = 25%,

By Region: North America = 10%, Europe = 30%, APAC = 40%, and RoW = 20%

A few solid-state cooling market ecosystem players are as follows: Ferrotec (Japan), Laird Thermal Systems (US), II-VI Marlow (US), TE Technology (US), TEC Microsystems (Germany), Crystal Ltd. (Russia), Kryotherm (Russia), RMT Ltd (Russia), Thermion Company (Ukraine), Thermonamic Electronics (China), Kelk Ltd. (Japan), Z-Max (Japan), and Alphabet Energy (US).

Research Coverage:

Solid-State Cooling Market by Product (Refrigeration System and Cooling System), Type (Single Stage, Multi Sta...

This research report segments the global solid-state cooling market by type, product, end-user industry, and geography. The report discusses major drivers, restraints, challenges, and opportunities pertaining to the solid-state cooling market and also includes value chain. The study also includes an in-depth competitive analysis of key players in the market, along with 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 market leaders/new entrants in this market with information on the closest approximations of the revenue numbers for the overall solid-state cooling market and the subsegments. This report will help stakeholders understand the competitive landscape and gain more insights to better position their businesses and to plan suitable go-to-market strategies. The report also helps stakeholders understand the pulse of the market and provides them with information on key market drivers, restraints, challenges, and opportunities.

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