

# Thermoelectric Modules Market by Model (Single Stage, Multi Stage), Type (Bulk, Micro, Thin Film), Functionality (General Purpose, Deep Cooling), End-Use Application (Consumer Electronics, Automotive), Offering and Region - Global Forecast to 2027

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## Abstracts

The thermoelectric modules market is expected to grow from USD 693 million in 2022 and is projected to reach USD 1,054 million by 2027; it is expected to grow at a CAGR of 8.8% during the forecast period. Advantages such as compact design of TEMs compared to vapor-compression cooling systems, drives the adoption of TEMs across several end-use application. Additionally, ability of TEMs to produce hot and cold water for different functions adds to its rising adoption in different applications. Furthermore, the rapidly growing market for electric and luxury vehicles is also expected to drive thermoelectric modules market. TEMs are used in electric vehicles to stabilize the temperature of a car's battery-operated system.

“Market for multistage thermoelectric modules to grow at higher CAGR during forecast period”

Multistage thermoelectric modules are also known as cascade thermoelectric modules. They work on high-temperature differentials between the hot and cold sides of the module. These modules are designed to achieve significantly higher temperature differentials of around 130°C. Hence, cascaded modules are stacked on top of one another whereby the cold side of one module becomes the hot side of another module mounted above. Multistage thermoelectric modules are suitable for applications in which a low-to-medium cooling capacity is required.

“Market for micro thermoelectric modules to grow at highest CAGR during forecast

period”

Micro thermoelectric modules are devices that have semiconductor elements with dimensions of less than 1.0 mm square. They can easily convert heat into electricity, starting from a zero-temperature difference. Further, these modules help in decreasing the energy consumption of electric devices, such as wearables and wireless sensors. Technological advancements have resulted in product miniaturization; as a result, the number of microdevices, such as microprocessors, microsensors, microcontrollers, and micro-instruments, has increased. Therefore, the demand for micro thermoelectric modules is likely to grow in the coming years.

“Market for automotive application to grow at highest CAGR during forecast period”

Thermoelectric modules are prominently used in the automotive application for automotive seat cooling/heating, cup holders, glove boxes, automotive night vision, and waste heat recovery. For automotive seats, thermoelectric modules are used as they can switch easily between heating and cooling functions. Autonomous systems provide numerous benefits in modern vehicles. High-temperature thermoelectric coolers provide the thermal management solution needed to operate each system within an acceptable temperature range and optimize its performance. The growth in the production of light vehicles is expected to increase the demand for thermoelectric modules in the automotive application. With the fast growth of electric cars, thermoelectric modules are expected to be used to a greater degree to maintain the optimal temperature of battery packs.

“APAC to create highest growth opportunities for thermoelectric modules market among other region during the forecast period”

APAC is the largest consumer electronics market in terms of manufacturing and consumption of consumer electronics products. In China, the demand for consumer electronic products is increasing in the country due to its large population. The industrial application is the second-largest segment in the thermoelectric modules market in China, followed by the automotive segment. The Japanese government has taken initiatives to bring a robotic revolution in the country to increase the use of intelligent machines in the manufacturing and healthcare sectors, which would drive the thermoelectric modules market in Japan in the industrial sector. South Korea, one of the leading manufacturers of electric and hybrid vehicles, is expected to create high growth opportunities for thermoelectric modules market with growing electric vehicles market.

In the process of determining and verifying the market size for several segments and subsegments gathered through secondary research, extensive primary interviews have been conducted with key industry experts in the thermoelectric modules market space. The break-up of primary participants for the report has been shown below:

By Company Type: Tier 1 – 40%, Tier 2 – 30%, and Tier 3 – 30%

By Designation: C-level Executives – 40%, Directors – 40%, and Others – 20%

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

The report profiles key players in the thermoelectric modules market with their respective market ranking analysis. Prominent players profiled in this report are Ferrotec (Japan), Laird Thermal Systems (US), II-VI Incorporated (US), Kelk (Japan), Guangdong Fuxin Technology (China), TE Technology (US), TEC Microsystems (Germany), Crystal (Russia), Kryotherm (Russia), and Phononic (US).

#### Research Coverage:

This research report categorizes the thermoelectric modules market on the basis of model, type, functionality, end-use application, offering, and geography. The report describes the major drivers, restraints, challenges, and opportunities pertaining to the thermoelectric modules market and forecasts the same till 2027. Apart from these, the report also consists of leadership mapping and analysis of all the companies included in the thermoelectric modules ecosystem.

#### 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 thermoelectric modules 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 market and provides them with information on key market drivers, restraints, challenges, and opportunities.

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