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Global Semiconductor Temperature Control Equipment Supply, Demand and Key Producers, 2026-2032

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Abstracts

The global Semiconductor Temperature Control Equipment market size is expected to reach $ 1397 million by 2032, rising at a market growth of 7.0% CAGR during the forecast period (2026-2032).

Semiconductor Temperature Control Equipment refers to specialized systems designed to maintain precise thermal conditions during semiconductor fabrication processes, such as etching, deposition, and lithography. These devices regulate temperature with high accuracy (±0.1°C to ±1°C) to ensure process stability, prevent material defects, and optimize yield. Key components include refrigeration cycles, heat exchangers, sensors (e.g., NTC thermistors), and control modules (e.g., PID algorithms).

Semiconductor temperature control equipment is a type of equipment specially used in the semiconductor manufacturing process. It is mainly used to accurately control the temperature of the reaction chamber to meet the temperature control needs of the semiconductor process. It is an indispensable key equipment in the integrated circuit manufacturing process and is mainly composed of heat exchangers, controllers, compressors and other parts. Semiconductor temperature control equipment can ensure that the semiconductor manufacturing process is carried out under constant temperature conditions, which is crucial to ensuring product quality and improving production efficiency.

China is currently the world’s largest market of Semiconductor Temperature Control Equipment (Semiconductor Chiller), accounted for 30.63% of the global share in 2025, followed by North America (22.79%), China Taiwan province (17.85%), and South Korea (14.1%).

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North American market for Semiconductor Temperature Control Equipment was valued at $ 193.4 million in 2025 and will reach $ 285.85 million by 2032, at a CAGR of 5.78% during the forecast period of 2026 through 2032.

China market for Semiconductor Temperature Control Equipment was valued at $ 259.9 million in 2025 and will reach $ 480.96 million by 2032, at a CAGR of 9.13% during the forecast period of 2026 through 2032.

Europe market for Semiconductor Temperature Control Equipment was valued at $ 44.46 million in 2025 and will reach $ 63.83 million by 2032, at a CAGR of 5.67% during the forecast period of 2026 through 2032.

South Korea market for Semiconductor Temperature Control Equipment was valued at $ 119.64 million in 2025 and will reach $ 188.49 million by 2032, at a CAGR of 6.61% during the forecast period of 2026 through 2032.

The global key manufacturers of Semiconductor Temperature Control Equipment include Advanced Thermal Sciences (ATS), Shinwa Controls, Beijing Jingyi Automation, Unisem, Thermo Fisher Scientific, FST (Fine Semitech Corp), SMC Corporation, Techist, Ferrotec, and GST (Global Standarard Technology), etc. In 2025, the global ten largest players hold a share approximately 78.25% in terms of revenue.

From the production side of Semiconductor Temperature Control Equipment, North America, South Korea, Japan, and China dominate Semiconductor Temperature Control Equipment production. In 2025, these regions held market shares of 29.36%, 24.32%, 19.62%, and 23.31%, respectively. China is expected to maintain the fastest growth, with its share projected to reach 31.3% by 2032.

In terms of product type, dual channel chillers hold the largest market share, expected to reach 61.53% by 2031. While in terms of applications, etching accounted for approximately 60.74% in 2024, with a projected CAGR of 5.65% in the coming years.

In terms of cooling technologies, water-cooled chillers dominate the market (over 80.8% share in 2025), while air-cooled and hybrid types hold smaller shares. water-cooled chillers are expected to remain predominant in the foreseeable future.

In terms of technical pathways, currently compressor-type chillers and heat exchangers are in the dominant position, however, thermoelectric (TEC) chillers are projected to

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exhibit the fastest growth in the coming years.

The global Semiconductor Temperature Control Equipment market is expanding alongside the semiconductor upcycle and the sustained build-out of fab capacity and installed-base process tools. In 2024, worldwide semiconductor sales reached US$627.6B, and the sales outlook remains strongly positive into 2025–2026, supporting high utilization and continued equipment demand. Semiconductor Industry Association At the same time, SEMI forecasts total semiconductor manufacturing equipment sales of US$125.5B (2025) and US$138.1B (2026), and its World Fab Forecast expects 18 new fabs to start construction in 2025—both of which translate directly into incremental chillers for new tool shipments and for supporting sub-systems. Demand is also “premiumizing” because chillers are increasingly yield-enabling rather than utility-like: toolmakers commonly require temperature stability around ±0.1 K for many process loops (e.g., etch) and down to ±0.001 K for the most temperature-sensitive applications (e.g., lithography), with operating ranges that can span -80°C to +150°C depending on the loop and use case. This drives higher value per system (better controls, tighter hydraulics, higher-quality sensors/valves/filtration, and application-specific thermal loop engineering) and a growing recurring aftermarket (preventive maintenance, spares, field service) as fabs push uptime and variability targets.

Key market trends and drivers are converging around performance, energy, compliance, and reliability. First, tighter process windows and higher local heat flux push TCUs toward faster transient response, multi-circuit/multi-zone architectures, and more liquid-to-liquid and “right-temperature” designs that match each sub-loop’s needs to reduce total energy consumption without sacrificing stability. Second, fabs increasingly require connected chillers (telemetry, remote diagnostics, predictive maintenance) and modular/redundant designs to protect tool availability as the installed base scales. Third, environmental regulation is becoming a specification-level constraint: the European Union F-gas Regulation (EU) 2024/573 is accelerating adoption of lower-GWP refrigerants, forcing platform redesigns, re-qualification, and updated service procedures across suppliers and fab operators. Fourth, EHS and material stewardship are rising in importance for semiconductor thermal ecosystems—e.g., industry discussions around heat-transfer fluids emphasize tight control requirements (often ~±0.1°C) and compatibility constraints, which can influence fluid selection and qualification practices alongside chiller design. Overall, the core growth engine is the combination of fab expansion + higher thermal-performance requirements + lifecycle support intensity, with regulation and sustainability accelerating technology refresh and creating additional retrofit/replacement demand.

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This report studies the global Semiconductor Temperature Control Equipment production, demand, key manufacturers, and key regions.

This report is a detailed and comprehensive analysis of the world market for Semiconductor Temperature Control Equipment and provides market size (US$ million) and Year-over-Year (YoY) Growth, considering 2025 as the base year. This report explores demand trends and competition, as well as details the characteristics of Semiconductor Temperature Control Equipment that contribute to its increasing demand across many markets.

Highlights and key features of the study

Global Semiconductor Temperature Control Equipment total production and demand, 2021-2032, (Units)
Global Semiconductor Temperature Control Equipment total production value, 2021-2032, (USD Million)
Global Semiconductor Temperature Control Equipment production by region & country, production, value, CAGR, 2021-2032, (USD Million) & (Units), (based on production site)
Global Semiconductor Temperature Control Equipment consumption by region & country, CAGR, 2021-2032 & (Units)
U.S. VS China: Semiconductor Temperature Control Equipment domestic production, consumption, key domestic manufacturers and share
Global Semiconductor Temperature Control Equipment production by manufacturer, production, price, value and market share 2021-2026, (USD Million) & (Units)
Global Semiconductor Temperature Control Equipment production by Type, production, value, CAGR, 2021-2032, (USD Million) & (Units)
Global Semiconductor Temperature Control Equipment production by Application, production, value, CAGR, 2021-2032, (USD Million) & (Units)

This report profiles key players in the global Semiconductor Temperature Control Equipment market based on the following parameters - company overview, production, value, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include Advanced Thermal Sciences (ATS), Shinwa Controls, Unisem, GST (Global Standarard Technology), SMC Corporation, Beijing Jingyi Automation Equipment Technology, FST (Fine Semitech Corp), Techist, Thermo Fisher Scientific, Mirapro Co., Ltd, etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

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Stakeholders would have ease in decision-making through various strategy matrices used in analyzing the World Semiconductor Temperature Control Equipment market

Detailed Segmentation:

Each section contains quantitative market data including market by value (US$ Millions), volume (production, consumption) & (Units) and average price (US$/Unit) by manufacturer, by Type, and by Application. Data is given for the years 2021-2032 by year with 2025 as the base year, 2026 as the estimate year, and 2027-2032 as the forecast year.

Global Semiconductor Temperature Control Equipment Market, By Region:

United States

China

Europe

Japan

South Korea

ASEAN

India

Rest of World

Global Semiconductor Temperature Control Equipment Market, Segmentation by Type:

Single Channel Chiller

Dual Channel Chiller

Three Channel Chiller

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Global Semiconductor Temperature Control Equipment Market, Segmentation by Technology:

- Compressor Type Chiller
- Heat Exchanger Type Chiller
- Thermoelectric (TEC) Chiller
- Cryogenic Chiller

Global Semiconductor Temperature Control Equipment Market, Segmentation by Application:

- Etching
- Coating and Developing
- Ion Implantation
- Diffusion
- Deposition
- CMP
- Other

Companies Profiled:

- Advanced Thermal Sciences (ATS)
- Shinwa Controls
- Unisem
- GST (Global Standarard Technology)

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SMC Corporation

Beijing Jingyi Automation Equipment Technology

FST (Fine Semitech Corp)

Techist

Thermo Fisher Scientific

Mirapro Co., Ltd

Solid State Cooling Systems

LNEYA Thermo Refrigeration

BV Thermal Systems

Legacy Chiller

LAUDA-Noah

CJ Tech Inc

Step Science

Thermonics (InTest Thermal Solutions (ITS))

Maruyama Chillers

Mydax, Inc.

Sanhe Tongfei Refrigeration

Ferrotec

Ebara

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AIRSYS Cooling Technologies Inc.

GMC Semitech

PTC, Inc.

Key Questions Answered:

1. How big is the global Semiconductor Temperature Control Equipment market?
2. What is the demand of the global Semiconductor Temperature Control Equipment market?
3. What is the year over year growth of the global Semiconductor Temperature Control Equipment market?
4. What is the production and production value of the global Semiconductor Temperature Control Equipment market?
5. Who are the key producers in the global Semiconductor Temperature Control Equipment market?
6. What are the growth factors driving the market demand?

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Contents

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5 MARKET ANALYSIS BY TYPE

6 MARKET ANALYSIS BY WORKING PRINCIPLE

7 MARKET ANALYSIS BY DEPLOYMENT METHODS

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8 MARKET ANALYSIS BY APPLICATION

9 COMPANY PROFILES

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List Of Tables

LIST OF TABLES

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List Of Figures

LIST OF FIGURES

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