

Global Dielectric Fluid for Two-phase Liquid-cooled Cold Plate Modules Market Growth (Status and Outlook) 2026-2032

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Abstracts

The global Dielectric Fluid for Two-phase Liquid-cooled Cold Plate Modules market size is predicted to grow from US\$ 100 million in 2025 to US\$ 416 million in 2032; it is expected to grow at a CAGR of 22.8% from 2026 to 2032.

Dielectric fluid for two-phase liquid-cooled cold plate modules refers to a non-conductive coolant specifically designed for 'two-phase phase change cooling' systems. It rapidly removes the large amount of heat generated by high heat flux density chips such as GPUs, CPUs, AI accelerators, and power semiconductors through a boiling and evaporation process within the microchannels of the cold plate, transitioning from a liquid state to a gaseous state. The coolant is then re-liquefied in a condenser, forming a closed-loop cycle. These liquids typically possess characteristics such as low boiling point, high dielectric strength, high latent heat of vaporization, low viscosity, low surface tension, and excellent chemical stability. They mainly include HFE, HFO, PFPE, fluorocarbon liquids, and novel environmentally friendly fluorinated dielectric fluids, and can be widely used in AI servers, supercomputing centers, data centers, military electronics, electric vehicle power modules, and high-performance electronic heat dissipation.

The dielectric fluid industry chain for two-phase liquid-cooled cold plate modules mainly consists of three segments: upstream fluorochemical raw materials, midstream dielectric fluid synthesis and formulation, and downstream liquid cooling systems and end-user applications. The upstream sector includes suppliers of fluorochemical raw materials, HFO/HFE monomers, fluoropolymers, electronic-grade solvents, and fine chemicals; the midstream sector comprises dielectric fluid development and production companies, responsible for optimizing liquid formulations, insulation stability, phase

change performance, and environmental performance; the downstream sector includes cold plate manufacturers, liquid-cooled server manufacturers, data center operators, and AI computing power companies, ultimately applying their solutions to AI training clusters, HPC supercomputing, cloud data centers, edge computing, and power electronics cooling in new energy vehicles.

With the rapid growth of generative AI, large-scale model training, GPU clusters, and high-density computing servers, traditional air cooling and single-phase liquid cooling are no longer sufficient to meet the heat dissipation requirements of chips with thermal design power (TDP) exceeding 1000W. Two-phase liquid-cooled cold plate dielectric fluids are gradually becoming an important direction for next-generation high-heat-fluidity heat dissipation. Compared to traditional cooling methods, two-phase dielectric fluids can achieve higher heat flux, lower PUE, smaller footprint, and lower energy consumption through 'boiling phase change,' making them particularly suitable for AI data centers, liquid-cooled supercomputing, advanced packaged chips, and high-power IGBT/SiC modules. With the increasing adoption of ultra-high power consumption GPU platforms such as NVIDIA Blackwell and Rubin, and the rising energy conservation and emission reduction requirements for data centers worldwide, the two-phase liquid cooling dielectric market will enter a phase of rapid growth. Meanwhile, environmental restrictions on PFAS are driving the industry to upgrade from traditional PFPE/Novec to low-GWP environmentally friendly HFO/HFE dielectrics. Domestic substitution and the development of new fluorinated liquids will also become important areas of competition in the future.

This report presents a comprehensive overview, market shares, and growth opportunities of Dielectric Fluid for Two-phase Liquid-cooled Cold Plate Modules market by product type, application, key players and key regions and countries.

Segmentation by Type:

Two-phase Phase Change Dielectric Fluid

Two-phase Immersion Fluid

Others

Segmentation by Boiling Point:

Ultra-low boiling point (90°C)

Segmentation by Application:

Data Centers

Power Electronics

Military Electronics

New Energy Vehicles

Others

This report also splits the market by region:

United States

China

Europe

Other regions

Japan

South Korea

Southeast Asia

Rest of world

The report also presents the market competition landscape and a corresponding detailed analysis of the major players in the market. The key players covered in this report:

Chemours

AGC Inc

Juhua Group

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