

Direct-to-chip Liquid Cooling Market Size, Share & Trends Analysis Report By Cooling Solution Type, By Component Cooling, By Liquid Coolant Type, By Application, By End Use, By Region, And Segment Forecasts, 2025 - 2030

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Abstracts

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Direct-to-chip Liquid Cooling Market Trends

The global direct-to-chip liquid cooling market size was estimated at USD 1.96 billion in 2024 and is anticipated to grow at a CAGR of 19.7% from 2025 to 2030. Modern processors, including CPUs, GPUs, and ASICs, are generating more heat due to higher power densities.

Traditional air cooling methods are becoming less effective at managing this increased thermal output. Direct-to-chip liquid cooling systems address this challenge by providing efficient heat removal directly at the chip level, ensuring optimal performance and preventing overheating.

The exponential power density of modern CPUs and GPUs in data centers and high-performance computing (HPC) environments is also contributing to the growth of direct-to-chip liquid cooling industry. As processors such as NVIDIA's H100 and AMD's EPYC 9004 series push thermal design power (TDP) beyond 500W per chip, traditional air cooling becomes inefficient and cost-prohibitive. Direct-to-chip systems, which deliver coolant directly to cold plates attached to processors, achieve heat removal efficiency, enabling higher clock speeds and sustained performance without thermal throttling. For instance, in March 2025, CoolIT, a provider of liquid cooling solutions,

introduced a cold plate designed for direct liquid cooling in data centers, targeting high-efficiency thermal management for components such as CPUs and GPUs. Similar in principle to AIO and custom liquid cooling setups used in personal computers, this technology falls under the direct-to-chip (D2C) cooling category, offering enhanced performance for demanding data center environments.

As semiconductor technology continues to advance, chips are becoming smaller yet more powerful, which increases the power density and heat output. This trend is particularly prevalent in microprocessors, GPUs, and memory modules. Direct-to-chip liquid cooling provides an efficient solution to manage the heat produced by these densely packed components, maintaining system stability and performance. The need to cool high-power density chips without sacrificing size or performance is a significant driver for the adoption of liquid cooling technologies.

The proliferation of AI, machine learning, and deep learning applications has led to a surge in computational requirements. These applications necessitate hardware capable of handling intensive workloads, which in turn generates substantial heat. Direct-to-chip liquid cooling solutions are increasingly adopted in data centers to meet these demands, ensuring that systems remain cool and efficient under heavy processing loads.

Global Direct-to-Chip Liquid Cooling Market Report Segmentation

This report forecasts revenue growth at global, regional, and country levels and provides an analysis of the latest industry trends in each of the sub-segments from 2018 to 2030. For this study, Grand View Research has segmented the direct-to-chip liquid cooling market report based on cooling solution type, component cooling, liquid coolant type, application, end use, and region.

Solution Type Outlook (Revenue, USD Billion, 2018 - 2030)

Single-phase liquid cooling

Two-phase liquid cooling

Component Cooling Outlook (Revenue, USD Billion, 2018 - 2030)

CPU cooling

GPU cooling

ASIC cooling

Memory cooling

Other

Liquid Coolant Type Outlook (Revenue, USD Billion, 2018 - 2030)

Water-based coolants

Dielectric fluids

Mineral oils

Engineered fluids

Application Outlook (Revenue, USD Billion, 2018 - 2030)

Datacenter

Workstations

High-performance computing (HPC)

Edge computing devices

Supercomputers

Others

End Use Outlook (Revenue, USD Billion, 2018 - 2030)

Telecommunications

Financial services

Healthcare and life sciences

Oil and gas

Aerospace and defense

Others

Regional Outlook (Revenue, USD Billion, 2018 - 2030)

North America

U.S.

Canada

Mexico

Europe

UK

Germany

France

Asia Pacific

China

India

Japan

South Korea

Australia

Latin America

Brazil

Middle East & Africa

UAE

Saudi Arabia

South Africa

Companies Mentioned

Asetek

Advanced Micro Devices, Inc.

Chilldyne, Inc.

CoolIT Systems

Fujitsu Ltd.

Iceotope Technologies

JETCOOL Technologies Inc.

LiquidStack

Schneider Electric

Submer

Vertiv Holdings Co

ZutaCore

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