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Global Immersion Cooling Market Size Study, By Product (Single-phase, Two-phase), By Application (High-performance Computing, Edge Computing, Cryptocurrency Mining, Artificial Intelligence), By Cooling Liquid (Mineral Oil, Fluorocarbon-based Fluids, Deionized Water, Others), and Regional Forecasts 2022-2032

https://marketpublishers.com/r/G03FC4A1973EEN.html
Date: March 2025
Pages: 285
Price: US$ 3,218.00 (Single User License)
ID: G03FC4A1973EEN

Abstracts

The global immersion cooling market was valued at approximately USD 232.04 million in 2023 and is projected to grow at a CAGR of 23.6% over the forecast period 2024-2032. The surge in data center establishments, cryptocurrency mining, and artificial intelligence (AI) applications has propelled the demand for efficient cooling solutions, positioning immersion cooling as a preferred technology for high-performance computing environments.

Immersion cooling technology, which submerges electronic components in dielectric liquids, significantly enhances energy efficiency and reduces operational costs. The adoption of single-phase and two-phase immersion cooling is rising, as businesses seek to improve Power Usage Effectiveness (PUE) while ensuring hardware longevity. Reports from the International Energy Agency (IEA) indicate that data centers currently consume nearly 460 Terawatt hours (TWh) of electricity annually, a figure expected to double by 2026, further necessitating the adoption of liquid-based cooling.

Regulatory frameworks aimed at sustainability and energy efficiency in data centers, such as the European Commission’s Energy Efficiency Directive, are playing a crucial role in promoting immersion cooling solutions. Governments and enterprises alike are investing in energy-efficient cooling, compelling operators to transition from

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conventional air-based cooling to liquid immersion cooling for better thermal management. Additionally, advancements in fluorocarbon-based fluids and mineral oil-based cooling liquids have improved cooling system reliability, creating lucrative market opportunities.

The cryptocurrency industry's exponential growth has further driven the demand for immersion cooling systems, given that Bitcoin mining alone consumes approximately 155-172 TWh of electricity annually. Immersion cooling mitigates hardware thermal stress, enhances mining efficiency, and extends GPU and ASIC component lifespan, making it a compelling alternative to air-cooled solutions. As companies scale up mining operations and cloud computing workloads, liquid cooling solutions are anticipated to gain widespread adoption.

Despite the numerous benefits, high initial costs and system complexity remain barriers to adoption. However, technological innovations, including AI-driven cooling optimization, enhanced dielectric liquid formulations, and modular immersion cooling tanks, are expected to mitigate cost concerns. Major industry players are focusing on partnerships and acquisitions to expand market presence and enhance R&D investments. For example, in 2024, Submer announced its expansion into the U.S. market with a new R&D and manufacturing facility in Houston, Texas, to cater to the growing demand for liquid immersion cooling in data centers and HPC environments.

Major Market Players Included in this Report Are:

Fujitsu

DUG Technology

Green Revolution Cooling, Inc.

Submer

LiquidStack Holding B.V.

Midas Immersion Cooling

Aecorsis BV

DCX POLSKA SP. Z O.O.

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LiquidCool Solutions

STULZ GMBH

Asperitas

GRC (Green Revolution Cooling)

Iceotope Technologies Limited

Allied Control Limited

Dell Technologies

The Detailed Segments and Sub-segments of the Market are Explained Below:

By Product:

Single-phase

Two-phase

By Application:

High-performance Computing

Edge Computing

Cryptocurrency Mining

Artificial Intelligence

Others

By Cooling Liquid:

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- Mineral Oil
- Fluorocarbon-based Fluids
- Deionized Water
- Others

By Region:

North America

- U.S.
- Canada
- Mexico

Europe

- Germany
- UK
- France
- Italy
- Netherlands
- Russia

Asia Pacific

- China

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India

Japan

South Korea

Australia

Latin America

Brazil

Argentina

Middle East & Africa

Saudi Arabia

South Africa

Years considered for the study are as follows:

Historical Year – 2022

Base Year – 2023

Forecast Period – 2024 to 2032

Key Takeaways:

Market Estimates & Forecast for 10 years (2022-2032)

Annualized revenues & regional-level analysis for each market segment

Geographical landscape analysis with country-level market insights

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Competitive landscape with information on major market players

Key business strategies & investment recommendations

Competitive structure & demand-supply analysis

Comprehensive regulatory framework overview impacting market growth

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CHAPTER 10. RESEARCH PROCESS

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