Immersion Cooling Market Projected to Grow at a Robust CAGR of 17.9% to Reach US$ 1.8 Billion by 2034 | TMR

Valued at $287.7 Mn in 2023, the immersion cooling market is set for rapid growth, reaching $1.8 Bn by 2034, driven by tech advancements.

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> *Transparency Market Research*

WILMINGTON, DE, UNITED STATES, December 16, 2024 /EINPresswire.com/ -- The global immersion cooling market was valued at US$ 287.7 million in 2023 and is expected to grow at a CAGR of 17.9% from 2024 to 2034, reaching approximately US$ 1.8 billion by the end of the forecast period. This rapid growth is fueled by increasing investments in data center infrastructure, rising energy consumption, and growing carbon emissions, which are driving demand for energy-efficient cooling solutions.

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Analyst Viewpoint: Drivers and Opportunities

The immersion cooling market is being propelled by the surge in data traffic and internet usage, alongside the emergence of high-performance computing needs driven by AI, cryptocurrency mining, and edge computing. The growing focus on green data centers to reduce environmental impact and improve energy efficiency is also playing a pivotal role in the market's expansion.

Immersion cooling offers superior thermal management and energy efficiency compared to traditional air-cooled systems. As global data traffic continues to escalate, this innovative cooling technology is becoming essential for enabling sustainable, high-density computing environments.

Market Introduction: Immersion Cooling Technologies

Immersion cooling involves the use of dielectric liquids to dissipate heat from electronic components. There are two main types of systems:

1. Single-phase immersion cooling:

The dielectric fluid absorbs heat directly from components, remaining in liquid form as its temperature rises. It is then cooled via heat exchangers.

2. Two-phase immersion cooling:

The fluid boils upon absorbing heat, turning into vapor. The vapor condenses on heat exchangers and returns to the system as liquid in a continuous cycle.
Both systems are designed to maximize energy efficiency and deployment scalability. They are ideal for AI applications, edge computing, and cryptocurrency mining, where power density and heat generation are significantly higher.

Market Drivers

1. Increase in Investment in Data Center Infrastructure

The proliferation of internet users—expected to surpass 5 billion in 2024—and the explosion of data creation (approximately 402.74 million terabytes daily) are fueling massive investments in data center infrastructure globally.

• Example: In June 2024, Google completed its fourth data center in Singapore, with a total investment of US$ 5 billion.

These trends are driving demand for efficient cooling technologies to support the growth of data-intensive applications.

2. Rise in Energy Consumption and Carbon Emissions

Data centers are among the most energy-intensive facilities, accounting for 1.5% of global electricity consumption and contributing significantly to CO_2 emissions. With the adoption of AI technologies, energy demands are expected to increase tenfold by 2026, according to the International Energy Agency (IEA).

Immersion cooling can drastically reduce energy consumption in cooling systems, providing a sustainable solution for high-energy environments.

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Regional Outlook: Asia Pacific Leads the Market

In 2023, Asia Pacific held the largest share of the immersion cooling market, driven by significant investments in green data centers. Governments in the region are enforcing stringent energy and emissions regulations, which are spurring innovation in cooling solutions.

• Key Development: In 2023, Schneider Electric announced a US$ 1.2 million investment in Singapore to develop sustainable cooling technologies in collaboration with the Sustainable Tropical Data Centre Testbed (STDCT).

Meanwhile, North America is witnessing increased adoption of immersion cooling, with companies expanding their operations to cater to the rising demand for AI and high-performance computing.

• Example: In 2023, SK Enmove, GRC, and Dell Technologies collaborated to commercialize liquid immersion cooling technology for data centers in the U.S.

Key Players and Competitive Landscape

The immersion cooling market features several prominent players focusing on innovative cooling solutions to meet the demands of AI, cryptocurrency, and edge computing. Key companies include:

• Fujitsu
• DUG Technology
• GRC
• Submer
• LiquidStack Holding B.V.
• Asperitas
• Midas Green Technologies

Recent Developments

1. LiquidStack relocated its headquarters to Carrollton, Texas, in May 2024, highlighting its focus on the North American market.
2. Wiwynn showcased its next-generation edge computing and cooling solutions at the Mobile World Congress Barcelona 2024.

Market Segmentation

• By Product:
o Single-phase

o Two-phase

• By Cooling Liquid:
o Mineral Oil
o Fluorocarbon-based Fluid
o Deionized Water
o Others

• By Application:
o High-performance Computing
o Edge Computing
o Cryptocurrency Mining
o Artificial Intelligence
o Others

• By Region:
o North America
o Europe
o Asia Pacific
o Latin America
o Middle East & Africa

Future Outlook

The immersion cooling market is poised for rapid growth, with increasing adoption across AI, edge computing, and other high-density computing applications. Innovations in dielectric liquids and the push for sustainable cooling solutions will play a critical role in addressing energy and environmental challenges in the data center industry. The market's trajectory highlights its potential to become a cornerstone of modern data center infrastructure, ensuring scalability, efficiency, and sustainability.

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Contact:
Transparency Market Research Inc.
CORPORATE HEADQUARTER DOWNTOWN,
1000 N. West Street,
Suite 1200, Wilmington, Delaware 19801 USA
Tel: +1-518-618-1030
USA – Canada Toll Free: 866-552-3453
Website: https://www.transparencymarketresearch.com
Email: sales@transparencymarketresearch.com
Follow Us: LinkedIn| Twitter| Blog | YouTube

Atil Chaudhari
Transparency Market Research Inc.
+1 518-618-1030
email us here