

Immersion Liquid Cooling for Computer Rooms in Intelligent Buildings



Overview

Immersion cooling involves submerging IT hardware in dielectric fluid that does not conduct electricity. Heat generated by the components is transferred directly into the liquid, which is then circulated and cooled. Single-Phase Immersion Servers are submerged in a bath of liquid. Data center immersion cooling (or “liquid immersion cooling”) is an energy-efficient option that offers superior cooling for high-density workloads. Advanced AI chips are generating more heat in data centers, necessitating improved cooling solutions. Data Center. For decades, air cooling has been the standard for data centers. Rows of CRAC units, raised floors, and hot-aisle/cold-aisle containment kept servers running. But in 2025, that model is under pressure. The rise of AI workloads, GPU clusters, and high-density racks is straining the limits of air. It is a system and an ecosystem comprising various components such as Coolant Distribution Units (CDUs), cold plates, manifolds, liquid-cooled servers, heat rejection units, and complementary air-cooling components.



Article Content

Enhancing data center cooling efficiency and ability: A comprehensive ...

Recommendations for future research directions to improve the efficiency and ability of direct liquid cooling applications in data centers were concluded, emphasizing the need for user

An Overview Of Liquid Immersion Cooling Technology

These liquid cooling solutions can include options such as direct-to-chip and immersion cooling, both of which involve the use of a fluid to cool what

The immersion cooling technology: Current and future development in ...

Therefore, effective and efficient technology is needed to overcome the increasing operating temperature of computer servers and data centers. One of the most prominent cooling

Data Center Liquid Cooling: The AI Heat Solution

In two-phase immersion cooling, a server is dunked into a vat of liquid. The liquid actively boils next to the heat-producing components, cooling them in

Towards energy-efficient data centers: A comprehensive review of ...

Liquid cooling technology, which includes cold plate, immersion, and spray cooling, is one of the more promising cooling methods available. Air-side and water-side free cooling have their

Data centers take the plunge

Data centers are beginning to switch from air to liquid cooling. Liquid cooling is more effective at drawing heat away from sophisticated chips and could

AI-driven cooling technologies for high-performance data centres:

This study presents a comprehensive, system-wide review of next-generation cooling technologies, including direct liquid cooling, immersion cooling, two-phase systems, spray and jet

Data centers cooling: A critical review of techniques, challenges, and ...

Abstract In order to increase data centers' efficiency and performance, a proper cooling system should be applied. This article provides a comprehensive assessment which explores current

A Guide to Data Center Liquid Cooling

Explore data center liquid cooling as the solution to manage heat in high-density computing environments. Discover its efficiency today.

A review of the immersion liquid cooling technology for high ...

Coolant modification, liquid cooling structure optimization, and interface regulation are the three mainstream technical pathways for enhancing the performance of immersion liquid cooling

Design and Optimization of an Immersion Liquid Cooling System in ...

Design and Optimization of an Immersion Liquid Cooling System in Internet Datacenter Yufei Song, Zhiguo Liu*, Shiwu Li, Qingyong Jin

Liquid Dreams: The Rise of Immersion Cooling and Underwater Data ...

Potential problems include leakage of liquids in immersion cooling or damage and biofouling in underwater installation, leading to uncertain large-scale adoption. Industry Momentum

Advancement of Liquid Immersion Cooling for Data Centers

Abstract. With the increasing processing capabilities of data centers, the demand for advanced cooling has been increased, positioning liquid immersion cooling systems as a focal point due to their

Disrupting Data Centre Design

This report examines the transformative potential of liquid cooling, an emerging technology that is poised to become a cornerstone of modern data centre design. We will explore the diverse approaches to

Liquid Immersion Cooling: A Deep Dive into the Future

Overall liquid immersion cooling has moved beyond a promising solution to the standard for future development as demand for efficient cooling in

Optimizing AI Performance with Immersion Cooled Data Centers

GRC's patented immersion cooling technology simplifies deployment of data center cooling infrastructure eliminating the need for conventional cooling components and reducing data center design, build,

Advancement of Liquid Immersion Cooling for Data Centers

Liquid immersion cooling technology demonstrates vast potential in ensuring safety, enhancing heat exchange efficiency, and meeting the growing needs of future data center development.

Immersion Cooling for Data Centers: A Comprehensive

Immersion cooling is quickly becoming a leading choice for modern data centers that demand high performance, energy efficiency, and sustainability.

Data Center Cooling 2026: Liquid Immersion vs Air Economics

Executive Summary The explosive growth of AI and high-performance computing workloads is pushing traditional air-cooled data center infrastructure to thermal and economic limits.

Immersion cooling systems: Advantages and deployment strategies

Immersion cooling can enhance high-density cooling for AI and HPC infrastructure, offering superior thermal management.

Immersion cooling systems: Advantages and

Data center infrastructure is rapidly expanding, fueled by the ongoing rise of artificial intelligence (AI) and high-performance computing (HPC) workloads. As rack

Liquid and Immersion Cooling Options for Data Centers

Data center operators are evaluating liquid cooling options, as processing-intensive computing applications grow. The market for liquid cooling is slated to reach \$3

Liquid immersion cooling for sustainable data centers

Liquid immersion cooling technology is only the start. Read our upcoming blogs for more efficient and future-forward solutions in building a stronger, more sustainable data center industry.

Liquid cooling in AI data centers: 5 things to know

Google, Microsoft, Meta, Amazon and Alibaba are all investing heavily in liquid cooling technologies to support AI services in their data centers.

A review of the immersion liquid cooling technology for high ...

Immersion liquid cooling (ILC) is analyzed as a critical solution for high-density data center. Two coolant types and three system configurations are evaluated, correlating them with applicable

Immersion Cooling Data Centers | Hyperscale Builds 2025

Learn why immersion cooling is moving mainstream in hyperscale data centers. Explore benefits, adoption trends, and how AI drives high-density cooling

Cooling Strategies for Data Centres ⇒ Liquid vs Immersion Cooling

Efficient and cost-effective cooling strategies are now more essential than ever. This guide introduces the forward-looking liquid

Design of data center system for immersed liquid-cooled computer

Aiming at the problems of low convective heat transfer coefficient and high energy consumption in the air-cooled data center of immersed liquid cooling, an improved deep learning

Data Center Liquid Cooling: The AI Heat Solution

With immersion cooling, everything gets cooled by the same fluid. After the oil has whisked away the heat, there are various approaches to cooling

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