# Passive cooling solutions for AI servers

## Overview

This article examines passive cooling technologies, liquid cooling solutions, and smart thermal management strategies for high-density AI workstations. Familiarity with GPU architecture and basic thermal principles is recommended. Effective cooling is essential to maintain performance, prevent hardware degradation, and ensure reliable operation in noise-sensitive environments. Our systems use evaporation and condensation to transfer heat directly from the chip — no fans, no pumps, no noise. Hot tubs sit at about 38 to 40 degrees Celsius, warm enough that most people can only soak for about 15 minutes. Shift2DC researchers have once more been listed among the world's leading scientists, according to the 2025 edition of “Stanford World's Top 2% Scientists”.

## Article Content

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

Deploying liquid cooling in the data center

Adopting Liquid Cooling at Existing Data Centers The future of IT thermal management has arrived, and it''s a hybrid of air and liquid cooling technologies. Enterprises are adopting high-performance

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Value Quality Performance | Complete passive PC

We are known worldwide for our high-performance air and water coolers as well for our thermal pastes. Not only do we offer a wide range of cooling products for the

Server Cooling Solutions | Passive Loop Heat Pipes by Calyos

Discover Calyos'' passive Loop Heat Pipe systems for servers—efficiently cooling high-performance CPUs, GPUs, and FPGAs without pumps or maintenance.

Advanced Cooling Solutions for AI Servers

Traditional air cooling methods often struggle to maintain optimal temperatures, leading to thermal throttling, reduced efficiency, and even hardware failure. To address these challenges,

Hotter Than a Hot Tub: The 45°C Breakthrough to Cool AI''s Biggest ...

Although each generation offers significantly more computing power for each watt, full liquid-cooled AI compute infrastructure enables data centers to dramatically reduce cooling energy consumption —

High-density cooling: A guide to advanced thermal

Learn how to meet the high cooling demands of AI data centers with our guide on deploying high-density cooling solutions for maximum efficiency.

Advanced Single-phase Passive Immersion Cooling Solution with

In this topic, a single-phase passive immersion cooling reference solution including system architecture as well as engineering design BKM (Best Known Methods) of both natural convection and force air

Silent AI Workstation: Cooling Solutions for GPU Servers

Discover advanced cooling solutions for silent AI workstations, including liquid, immersion, and passive cooling technologies for high-density

5 Largest Underwater Data Centers in the World

Explore how underwater data centers are becoming a practical solution for cooling, energy efficiency, and future data infrastructure needs.

CoolRacks: Passive Rack Cooling for AI & HPC | JJ Cooling

Passive, two-phase CoolRacks systems cool high-density AI, GPU and HPC racks with no fans or pumps. Reduce pPUE, energy use and TCO with silent, maintenance-free rack cooling from JJ Cooling.

Multilayer Ceramic Chip Capacitors | Products

Among these, immersion cooling systems are said to be the most promising technology due to their significant cooling effects. This article introduces our company''s efforts regarding passive

Passive Two-Phase Electronics Cooling for AI, HPC & 5G | JJ Cooling ...

JJ Cooling Innovation provides passive two-phase cooling solutions for high-power electronics in AI, HPC and 5G applications. We design and validate loop thermosyphons, pulsating heat pipes and

Beyond the compressor-less hype: Matching data center cooling ...

For example, if a data center operates with server temperatures at 20°C/68°F while outdoor temperatures reach 35°C/95°F, compressor-based systems remain necessary because the

Delta Unveils Next-generation Power and Cooling Solutions for AI

In response to the surging demand for AI and cloud computing, Delta is at the forefront of developing next-generation power and cooling solutions for AI-driven data centers and high

Passive components applicable to immersion cooling systems for data ...

This article introduces our company''s efforts regarding passive component products for AI accelerator systems using this immersion cooling method.

The Cooling Revolution: Navigating the AI Server Thermal

Explore the future of AI server cooling. Our deep-dive report analyzes liquid cooling, immersion technology, NVIDIA''s impact, and Taiwan''s critical role in the global supply chain.

Passive Blog

Educational and Information news blog on passive electronic components. News, articles, videos, featured on capacitors, inductors, resistors

Navigating Liquid Cooling Architectures for Data Centers with AI

Executive summary Many AI servers with accelerators (e.g., GPUs) used for training LLMs (large language models) and inference workloads, generate enough heat to necessitate liquid cooling.

Air vs. liquid cooling: Pick the right strategy for AI data

Explore air vs. liquid cooling for AI data centers. Learn how hybrid cooling strategies support high-density racks and optimize energy efficiency.

Navigating Liquid Cooling Architectures for Data Centers with AI

There are six common heat rejection architectures for liquid cooling where we provide guidance on selecting the best one for your AI servers or cluster. AI training and inference servers use

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

Additionally, other passive strategies not yet studied in DCs are critically examined. AD includes air, liquid, free, and two-phase cooling. This paper systematically compares the

Passive Cooling Solutions for High Power Server CPUs

Among them, active cooling consists of forced air cooling, forced liquid cooling, refrigerating and thermoelectric cooling, etc., and passive cooling

AI Server Cooling Systems: Importance and Best Methods

Explore AI server cooling solutions—liquid vs air, thermal management, power efficiency, and reliability for high-density AI infrastructure.

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

93. High-Performance Cooling Solutions for AI Servers

Unleash peak performance for your AI servers! Zaward''s cooling solutions tackle the thermal challenges of AI, maximizing efficiency and performance.

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

Special attention is given to commercially mature solutions such as RDHx and cold plate DLC, while the feasibility of emerging methods like AI-driven cooling, phase-change materials, and

## Contact Us

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