# How much does a network server rack immersion liquid cooling system cost

Article Overview

Immersion liquid cooling systems for server racks typically cost between $3,000 and $5,000 per kW of IT load, depending on system scale and configuration.

Overview of Costs

Immersion cooling involves submerging servers in non-conductive dielectric fluid contained in purpose-built tanks, which absorb and dissipate heat more efficiently than air or direct-to-chip liquid cooling . The total cost includes:

o Hardware: Tanks, pumps, dielectric fluid, and associated distribution units.
o Installation: Structural modifications, piping, and integration with heat rejection systems.
o Maintenance: Fluid replacement, leak detection, and monitoring systems.
o Operational savings: Reduced energy consumption and improved PUE (Power Usage Effectiveness).

Price Estimates

o Per kW cost: Immersion cooling carries a premium of $3,000-$5,000 per kW above standard direct-to-chip liquid cooling, which itself costs $1,000-$2,500 per kW .
o Per rack example: For a high-density AI server rack generating 50-100 kW, the immersion system alone could cost $150,000-$500,000 per rack, depending on the number of servers and fluid volume .
o Installation and infrastructure: Retrofitting an existing data center may increase costs due to structural load assessments and tank placement, while new builds can integrate immersion cooling more efficiently .

Cost Drivers
o Rack density: Higher kW per rack increases fluid volume and pump capacity requirements.
o Fluid type: Specialized dielectric fluids are expensive and must meet thermal and chemical stability standards.
o Tank size and configuration: Larger tanks for multiple servers or GPU trays increase upfront costs.
o Integration complexity: Connecting to external heat exchangers or dry coolers adds to installation expenses.

Benefits Offsetting Costs

o Energy efficiency: Immersion cooling can achieve PUE values close to 1.05, reducing electricity costs significantly .
o Hardware longevity: Lower operating temperatures reduce wear on components.
o Compute density: Supports high-performance GPUs without thermal throttling, enabling more powerful

workloads per rack.

Summary

For a modern high-density server rack, expect immersion liquid cooling systems to cost roughly $3,000-$5,000 per kW, with total per-rack costs ranging from $150,000 to $500,000 depending on configuration and density. While the upfront investment is higher than air or direct-to-chip liquid cooling, the energy savings, improved PUE, and hardware longevity often justify the cost for AI, HPC, or large-scale GPU deployments .

Immersion cooling is supposed to be the next big thing, but for many data centers, adding it

How much will GRC immersion cooling save you? Simply fill in the fields below to match your operation and click "Calculate" to find

Immersion Cooling: Submerging servers in dielectric fluid provides maximum cooling efficiency. Costs generally fall between $50,000

Two-Phase Immersion Cooling The cooling method in two-phase is similar to single-phase in that the coolant absorbs the heat from

LiquidStack, a leading direct-to-chip liquid cooling company, provides next-generation single and two

Schneider Electric"s data center liquid cooling solutions are purpose-built for AI workloads, GPU servers,

Discover the true cost of data center liquid cooling systems in 2025. Learn about installation, operational expenses, and

Supermicro liquid cooling solutions reduce power costs by up to 40%, accelerate time-to-deployment and time-to-online, and allow

Immersion cooling system basically consists in completely submerging a server into a dielectric liquid. This type of liquid does not

One form of liquid cooling, known as liquid immersion cooling, is a cutting-edge approach that involves submerging IT

Overall liquid immersion cooling has moved beyond a promising solution to the standard for

# How much does a network server rack immersion liquid cooling system cost

Immersion cooling and liquid cooling system for data center can significantly reduce energy consumption

Waterless direct-to-chip liquid cooling: Dielectric fluid is 100% IT safe and will not damage the server even in the unlikely event of a

Racks take up less than 1/2 the space of a tank for the same compute density. Our servers use 1/3 of the fluid vs. tanks, reducing

Unlock maximum scalability & energy efficiency in your data center. LiquidCool Solutions" immersion-cooled rack server (ZPServer)

How much does liquid immersion cooling cost per kW of IT load? Single-phase immersion cooling systems typically cost USD 4,500

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