LIQUID COOLING — GUIDE

Liquid Cooling Market Size and Forecast for AI Data Centers

Market data for data center liquid cooling: $8.3B in 2027, $22.56B by 2032 (22.1% CAGR). Segments by technology, coolant, data center type, workload, and geography.

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The data center liquid cooling market is entering a rapid growth phase driven by AI rack densities exceeding air-cooling limits. This guide summarizes market size, segmentation, and key trends from Mordor Intelligence's 2026 report.

Market size overview

| Metric | Value | Source | |--------|-------|--------| | Market size (2026, estimated) | $6.77 billion | Mordor Intelligence, 2026 | | Market size (2027, forecast) | $8.3 billion | Mordor Intelligence, 2026 | | Market size (2032, forecast) | $22.56 billion | Mordor Intelligence, 2026 | | CAGR (2027-2032) | 22.14% | Mordor Intelligence, 2026 |

Note: Mordor Intelligence's 2026 base combines nine months of actuals with Q4 projections. Other research firms publish different base figures, so treat the absolute size as firm-specific; the growth direction is consistent across them.

Segmentation by cooling technology (2026)

| Technology | Market share | Growth outlook | |------------|--------------|----------------| | Direct-to-chip liquid cooling | 42.79% | Steady growth; largest installed base | | Immersion cooling | Not published | Fastest growing: 26.12% CAGR (2027-2032) | | Rear-door heat exchangers (RDHx) | Not published | Strong retrofit demand |

Mordor publishes a 2026 share for direct-to-chip only; it does not publish shares for the other technologies in its public summary. Direct-to-chip covers cold-plate designs, so no separate "cold-plate" segment exists.

Key points:

- Direct-to-chip leads due to OEM warranty programs and NVIDIA/AMD reference designs (Mordor Intelligence, 2026)
- Immersion acceleration driven by two-phase fluorocarbon fluid supply chain maturation (Chemours/Navin Fluorine Opteon manufacturing capacity from 2026)
- RDHx favored for brownfield upgrades without server downtime

Segmentation by coolant type (2026)

| Coolant type | Market share | Growth outlook | |--------------|--------------|----------------| | Single-phase hydrocarbon fluids | 45.08% | Largest segment | | Two-phase fluorocarbon fluids | Not published | Fastest growing: 25.14% CAGR (2027-2032) | | Water / glycol solutions | Not

published | Facility-loop standard | | Nanofluids / specialty | Not published | Niche, early stage |

Key points:

- The first Intel Data Center Certified immersion solution (2025) used a Shell hydrocarbon fluid with Supermicro servers and a Submer tank (Intel, 2025)
- Chemours and Navin Fluorine agreed in May 2025 to manufacture Opteon two-phase immersion fluid, with capacity from 2026 (Chemours, 2025)
- Microsoft uses a closed liquid loop in its Fairwater AI data centers (Mordor Intelligence, 2026)

Segmentation by data center type (2026)

| Data center type | Market share | Growth outlook | |---|---|---| | Hyperscale | 39.17% | Largest; Google reports 2,000+ liquid-cooled TPU pods over seven years (Google, 2025) | | Colocation | Not published | Growing; Equinix KL2 and Teraco JB4 built liquid-ready | | Enterprise / on-premise | Not published | Slower adoption; brownfield constraints | | Edge and micro DCs | Not published | Fastest growing: 24.48% CAGR (2027-2032) |

Key points:

- Hyperscale operators (Microsoft, Google, Oracle, Meta) drive volume through multi-year deployment programs
- Edge growth driven by distributed AI inference (Mordor Intelligence, 2026)
- Colocation "hall-ready" model (Equinix, Teraco) decouples facility readiness from tenant deployment

Segmentation by workload (2026)

| Workload | Market share | Growth outlook | |---|---|---| | AI / Machine Learning | 35.79% | Fastest growing: 25.48% CAGR (2027-2032) | | HPC | Not published | Steady; traditional liquid cooling base | | Cloud / Virtualization | Not published | Growing with AI cloud services (DGX Cloud, OCI) | | Cryptocurrency mining | Not published | Immersion matured early in mining | | Other | Not published | — |

Key points:

- Oracle deployed its first liquid-cooled GB200 NVL72 racks on OCI Supercluster in 2025 (NVIDIA/Oracle, 2025)
- NVIDIA DGX Cloud and OCI software integrations make cooling part of the rented service stack (Mordor Intelligence, 2026)

Geographic breakdown (2026)

| Region | Market share | CAGR (2027-2032) | Key developments | |---|---|---|---| | North America | 36.97% | Not published | Microsoft Fairwater WI closed-loop liquid cooling; US hyperscale dominance | | APAC | Not published | **27.17%** (fastest) | Malaysia (Equinix KL2, AirTrunk JHB2), Japan, China, India | | Europe | Not published | Not published | Germany (Energy Efficiency Act), Switzerland (NorthC/Legrand RDHx), Portugal (SINES) | | South America | Not published | Not published | Brazil (ODATA/Aligned DeltaFlow at SP04) | | Middle East & Africa | Not published | Not published | South Africa (Teraco JB4 liquid-ready halls), UAE, Saudi Arabia |

Major players (2026)

| Company | Segment focus | Notable moves | |---------|--------------|---------------| | Vertiv Group | CDU, facility thermal | Named among CDU manufacturers benefiting from NVIDIA-aligned AI demand (Mordor Intelligence, 2026) | | Schneider Electric | CDU, facility | Launched the Motivair WCDU, up to 3.5 MW per unit, September 2026 (Schneider Electric, 2026) | | CoolIT Systems (Ecolab) | Direct-to-chip, CDU, services | Ecolab closed its ~$4.75B acquisition July 2026; CoolIT says its cold plates cool more than 5 million chips (Ecolab; CoolIT, 2026) | | LiquidStack (Trane Technologies) | Immersion, CDU | Trane completed the acquisition March 2026; LiquidStack announced a 300 MW CDU order in January 2025 (Trane; LiquidStack) | | Alfa Laval | Heat exchangers | Facility-loop system packages | | Asperitas | Immersion | Shell Ventures investor; Shell fluid partner | | Chilldyne (Daikin Applied) | Negative-pressure direct-to-chip | Acquired by Daikin Applied November 2025 (Daikin, 2025) | | Legrand (USystems) | RDHx | ColdLogik RDHx at NorthC Münchenstein, November 2025 (Legrand/NorthC, 2025) | | Rittal | RDHx, CDU | Independent vendor (Friedhelm Loh Group); not part of Legrand | | Submer, Iceotope, Green Revolution Cooling | Immersion | Single/two-phase immersion specialists | | Chemours, Shell, Syensqo | Fluids | Fluid qualification and supply chain |

Key drivers (2026-2032)

Mordor Intelligence names these growth drivers for the forecast window (Mordor Intelligence, 2026):

- Surging rack densities (>30 kW) in AI and HPC racks
- Hyperscale net-zero roadmaps
- OEM warranties that cover direct-to-chip cooling
- NVIDIA and AMD liquid-ready reference designs
- Government green data-center incentives
- Waste-heat reuse for district heating

Key restraints

Mordor Intelligence names these restraints (Mordor Intelligence, 2026):

- Limited field expertise among facility engineers
- High upfront retrofit costs for brownfield sites
- Fluid material-compatibility concerns
- Supply risk of specialty dielectric fluids

Market outlook summary

- **2027-2029**: Direct-to-chip dominates new AI builds; immersion scales with two-phase fluid supply; RDHx leads retrofit.
- **2029-2032**: Two-phase immersion grows as fluid supply stabilizes; edge deployments accelerate; standardization reduces integration friction.
- **Regulatory**: EU minimum performance standards (proposal Q2 2027), Brazil REDATA tax regime water-efficiency conditions (MP 1.318/2025), Germany Energy Efficiency Act tightening.

- **Standardization**: OCP, ASHRAE TC 9.9, and IEA 4E identify lack of standardization as a key barrier (Mordor Intelligence, 2026).

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Frequently asked questions

What is the current market size for data center liquid cooling?

Mordor Intelligence estimates $6.77B in 2026, $8.3B in 2027, reaching $22.56B by 2032 at 22.14% CAGR (Mordor Intelligence, 2026).

Which cooling technology has the largest market share?

Direct-to-chip liquid cooling held 42.79% share in 2026. Immersion cooling is forecast to grow fastest at 26.12% CAGR (2027-2032) (Mordor Intelligence, 2026).

Which region is growing fastest?

APAC at 27.17% CAGR (2027-2032), driven by Malaysia (Equinix KL2, AirTrunk JHB2), Japan, and China. North America held 36.97% share in 2026 (Mordor Intelligence, 2026).

What share does AI/ML workloads represent?

AI/ML was 35.79% of the market in 2026 and is the fastest-growing workload segment at 25.48% CAGR (Mordor Intelligence, 2026).