

EZASSI SIGNALS

Immersion Cooling for Data Centers

Commercial Signals · September 2026

A Commercial watch on whether immersion cooling is becoming a bought architecture in data centers, and how fast, against direct-to-chip liquid cooling: market share, the two-phase fluid supply after the 3M exit, incumbent deals, OEM qualification and named production deployments. Five signals from one cycle.

#	SIGNAL	CONFIDENCE	HORIZON	STATUS
1	Dell'Oro and converging market research consistently place direct-to-chip at 42-47% of liquid deployments, while immersion is characterized as selective adoption through end of decade	Medium	Long-term (1-3 years)	Review
2	Two-phase immersion's supply chain remains structurally broken: 3M's fluid exit is confirmed, the only named candidate replacement is still under EPA regulatory review, and fluid costs have risen sharply	Medium	Short-term (3-12 months)	Review
3	Two major incumbents deployed capital into liquid cooling during the monitoring period — LITEON's 176 million USD stake in DCX and Blackstone's acquisition of Flow Control Holdings — but neither transaction targets immersion specifically	Medium	Short-term (3-12 months)	Verified
4	Intel's Xeon single-phase immersion warranty rider — covering Supermicro hardware with Submer tanks and Shell fluid — establishes the first chipmaker-backed reference architecture for immersion, but covers only CPU-class chips, not GPU-class platforms	Medium	Short-term (3-12 months)	Review
5	The only named immersion deployment identified in the monitoring period — ResetData's reported 7 MW colocation allocation — sits below the 10 MW production trigger and has not been confirmed as commissioned	Low	Immediate (0-3 months)	Review

Every signal rests on two or more dated events. Confidence is published as a band. Where a signal sits below High, the reasoning names the evidence that is missing. Status says where the evidence stands: Verified, Review, or Inconclusive — we looked, and the evidence does not yet support a firmer call.

SIGNAL 1 OF 5

Dell'Oro and converging market research consistently place direct-to-chip at 42–47% of liquid deployments, while immersion is characterized as selective adoption through end of decade

MEDIUM Long-term (1–3 years) · Commercial & Market Signals · Review

Multiple independent sources, led by Dell'Oro, establish direct-to-chip as the default liquid-cooling architecture for AI infrastructure, with immersion assigned to specialized high-density use cases rather than volume displacement of air cooling.

REASONING

The signal rests on corroboration across source types: a named analyst firm (Dell'Oro), multiple commercial market-research providers, an industry-infrastructure advisory (JLL), and a secondary technical guide all converge on the same directional finding without being coordinated. Dell'Oro is the most authoritative of these and it explicitly assigns immersion to 'selective adoption' while naming single-phase direct liquid cooling as the prevailing architecture. The market-share percentages from commercial research firms cluster tightly (42–47% direct-to-chip) despite using different methodologies and market definitions, which strengthens the directional conclusion even if the precise figures cannot be verified as audited. The Goldman Sachs estimate embedded in the Axis Intelligence report — that liquid cooling will reach 76% of AI servers by end of 2026 versus 15% in 2024 — indicates the pace of the overall shift away from air cooling, while Dell'Oro's framing makes clear that the volume of that shift is being captured by direct-to-chip rather than immersion. No source in the findings contradicts this directional finding. Confidence is not higher because the market-share figures are from commercial research firms rather than independently audited operator deployment counts, and none of the sources provides a verified rack-level census.

PATTERN

Dell'Oro Group states that single-phase direct liquid cooling 'accounts for the vast majority of liquid-cooled capacity coming online today' and is expected to remain the prevailing architecture through end of decade, with immersion achieving only 'selective adoption'. Multiple commercial research sources independently place direct-to-chip at approximately 42–47% of liquid deployments in 2025–2026. Axis Intelligence embeds a Goldman Sachs estimate that liquid cooling will reach 76% of AI servers by end of 2026, up from 15% in 2024. Inside Deep Tech describes immersion as concentrated in selected HPC and colocation sites, with direct-to-chip identified as the leading production method in mainstream AI deployments, though this characterization comes from a secondary technical guide rather than a measured market-share finding. JLL identifies liquid cooling as necessary above 70 kW rack densities but treats direct-to-chip and immersion as competing alternatives rather than showing immersion gaining volume. AKCP reports direct-to-chip at approximately 70% of liquid-cooled deployments, attributing its lead to stronger OEM warranty and serviceability acceptance.

IMPLICATION

The primary question in this watch — whether immersion is taking racks away from air cooling at scale — is answered negatively for the near term. Direct-to-chip is executing that displacement. Immersion is not losing to air cooling; it is losing to direct-to-chip for the volume of incremental liquid-cooling deployments. The

monitoring priority should be tracking whether any specific density threshold or AI-chip generation shifts this balance, not waiting for immersion to broadly displace air.

RECOMMENDED ACTION

Request Dell'Oro's full liquid-cooling forecast report to obtain their methodology and any immersion-specific share estimates, and compare against the next major GPU-platform announcement (GB300 or successor) to test whether new chip thermal envelopes push density past the practical ceiling of direct-to-chip cold plates and open headroom for immersion.

SOURCES & WHAT THEY SIGNAL

- [AKCP: Immersion Cooling Data Center AI Buildout](#) — Reports direct-to-chip at approximately 70% of liquid-cooled deployments and attributes its lead to OEM warranty acceptance and serviceability advantages over immersion.
- [JLL: Liquid Cooling Enters the Mainstream in Data Centers](#) — Confirms density-driven liquid-cooling necessity above 70 kW but frames direct-to-chip and immersion as competing alternatives rather than showing immersion gaining volume.
- [Inside Deep Tech: Data Center Liquid Cooling AI Full Guide](#) — Secondary technical guide that describes immersion as confined to selected HPC and colocation sites and identifies direct-to-chip as the leading production method in mainstream AI deployments; characterization should be treated as secondary analysis rather than a measured market-share finding.
- [Axis Intelligence: Data Center Liquid Cooling Statistics 2026](#) — Reports direct-to-chip at approximately 47% of liquid deployments and carries the Goldman Sachs estimate of 76% AI server liquid-cooling penetration by end of 2026.
- [PRNewswire: AI Data Center Liquid Cooling Market to Jump at 17.2% CAGR](#) — Places direct-to-chip at 42–47% of current market revenue and positions it as the dominant deployment architecture for high-density AI cooling.
- [Future Market Insights: AI Datacenter Liquid Cooling Market](#) — Projects direct-to-chip at 47.0% of the AI datacenter cooling-technology segment in 2026, citing compatibility with existing server architectures.
- [Future Market Insights: GPU Memory Localized Liquid Cooling Solutions Market](#) — Projects direct-to-chip at 44.0% of cooling-architecture demand in 2026, reinforcing the same directional finding across a different market definition.
- [Dell'Oro Group: Data Center Liquid Cooling Market to Approach \\$7 Billion by 2029](#) — Most authoritative analyst source in the findings; explicitly assigns direct-to-chip the volume lead and labels immersion as selective adoption through end of decade.
- [Dell'Oro Group news page on data center liquid cooling](#) — Primary Dell'Oro publication page for the same forecast, corroborating the PRNewswire release.

SIGNAL 2 OF 5

Two-phase immersion's supply chain remains structurally broken: 3M's fluid exit is confirmed, the only named candidate replacement is still under EPA regulatory review, and fluid costs have risen sharply

MEDIUM Short-term (3–12 months) · Regulatory & Policy Signals · Review

The post-3M two-phase immersion supply chain has not been restored in the monitoring period: the principal candidate replacement fluid reportedly remains in active EPA regulatory review under TSCA, environmental groups have formally opposed it, Chemours describes Opteon 2P50 as developmental, and fluid costs have increased significantly — leaving two-phase immersion without a commercially available, cleared supply.

REASONING

The signal is grounded in a cluster of independently sourced, convergent events: reporting on an EPA regulatory review (Heatmap, August 31, 2026), formal advocacy-group opposition (The Guardian, July 27, 2026), a manufacturer's own product page describing the candidate fluid as developmental rather than commercially available, and an industry white paper reporting the cost impact of supply contraction. These are different source types pointing at the same structural problem. The convergence across regulator-facing reporting, advocacy activity, and manufacturer documentation makes this the strongest downside signal in the findings for two-phase specifically. Confidence is not higher because the Evaporion white paper cost figures (30–50% cost increase, 100 commercial deployments) are from an industry analyst/vendor white paper rather than a regulator or operator filing, and the EPA review status could change without appearing in current findings. The Heatmap reporting date and the precise regulatory status as of that date have not been independently verified.

PATTERN

Heatmap reported (attributed date: August 31, 2026, unconfirmed) that a proposed replacement for 3M's Novec immersion fluid is under EPA review under Section 5 of TSCA and had not, as of that report, been approved or authorized for commercial production — this specific regulatory status could not be independently confirmed from primary EPA sources. The Guardian reports (July 27, 2026) that U.S. environmental groups formally urged EPA to reject a new fluorinated cooling chemical associated with two-phase data-center systems. Chemours' own product page describes Opteon 2P50 as a 'proprietary developmental HFO dielectric fluid' and does not state commercial-production status; no public source found as of the monitoring period confirms server-OEM qualification, though this absence has not been exhaustively verified. The Cooling Report identifies 3M's exit as having removed Novec 7100, Novec 649, and Fluorinert FC-72 from the supply chain, and reports that Microsoft and Meta moved away from two-phase immersion research toward direct-to-chip. The Evaporion white paper (updated September 17, 2026) reports that fluid costs increased since 2023 because of supply contraction, and estimates a single immersion tank may require very large fluid volumes in dollar terms.

IMPLICATION

Two-phase immersion cannot be treated as a deployable architecture at scale until EPA resolves the TSCA review and a fluid manufacturer confirms commercial production and OEM qualification. Any operator or vendor roadmap premised on two-phase scaling in the next 12 months faces a material fluid-supply dependency that remains unresolved. This directly answers one of this watch's trigger conditions: the replacement fluid has not yet been 'ruled in' and is under active regulatory challenge.

RECOMMENDED ACTION

Monitor the EPA TSCA Section 5 docket directly for the candidate replacement fluid — do not rely solely on secondary reporting — and track Chemours' Opteon 2P50 product page and any press releases for a transition from 'developmental' to commercial status; trigger a review immediately if either event occurs, as it would remove the principal structural barrier to two-phase scaling. Verify the Heatmap August 31, 2026 reporting date and the precise EPA regulatory status described therein against primary EPA docket records.

SOURCES & WHAT THEY SIGNAL

- [Chemours: Opteon 2P50 Developmental Dielectric Heat Transfer Fluid](#) — Manufacturer's own product page describes Opteon 2P50 as 'developmental,' confirming no commercial-production milestone has been publicly announced on that page.
- [Chemours Opteon 2P50 Product Information Sheet](#) — Corroborates the product page's developmental characterization and confirms no completed commercial-production or OEM-qualification milestone is stated in this document.
- [Heatmap: Forever Chemicals Want a Piece of the Data Center Boom](#) — Reports that the proposed Novec replacement is under active EPA TSCA Section 5 review and has not been approved or commercially cleared — specific date and regulatory status require verification against primary EPA sources.
- [The Guardian: US Environmental Groups Urge EPA to Reject New PFAS for Data Center Cooling](#) — Documents formal advocacy opposition to EPA approval of a new fluorinated cooling chemical, adding regulatory headwind to the replacement-fluid pathway.
- [The Cooling Report: PFAS Two-Phase Immersion Cooling Crisis](#) — Documents which 3M fluids were removed from supply and reports that Microsoft and Meta shifted away from two-phase immersion toward direct-to-chip.
- [Evaporation: Thermal Challenges in Terrestrial AI Data Centers 2026-2030](#) — Industry white paper reporting fluid cost increases since 2023 due to supply contraction and characterizing supply-chain risk as still material.

SIGNAL 3 OF 5

Two major incumbents deployed capital into liquid cooling during the monitoring period — LITEON's 176 million USD stake in DCX and Blackstone's acquisition of Flow Control Holdings — but neither transaction targets immersion specifically

MEDIUM Short-term (3-12 months) · Commercial & Market Signals · **Verified**

Strategic and private-equity capital is entering the liquid-cooling infrastructure layer, but the transactions that closed in the monitoring period target broad liquid-cooling capability rather than immersion tanks, signaling that incumbents are buying the category without betting on immersion as the winning sub-architecture.

REASONING

Two transactions are documented in primary-source announcements within the monitoring period: LITEON's equity stake in DCX at a stated 176 million USD and Blackstone's acquisition of Flow Control Holdings. Both are verifiable deal announcements rather than speculation. The signal is that neither targets immersion specifically — DCX makes both direct-to-chip and immersion systems, and Flow Control Holdings provides flow-control components across liquid-cooling architectures. Taken together, these transactions indicate that HVAC and electronics incumbents want exposure to the liquid-cooling build-out without concentrating on immersion. This is analytically distinct from the trigger condition in this watch (an acquisition of an immersion vendor), which has not been met. Confidence is not higher because the strategic rationale behind each deal is inferred from available product descriptions rather than stated by the acquirers in the retrieved sources, and no transaction value was confirmed for the Blackstone deal.

PATTERN

LITEON announced a strategic investment in DCX Liquid Cooling Systems (Warsaw) at approximately 25% equity for approximately 176 million USD on September 3, 2026. IntelliNews reports that DCX manufactures both direct-to-chip and immersion systems, including coolant-distribution units, cold plates, and rack manifolds. Blackstone announced an agreement to acquire Flow Control Holdings from Audax Private Equity on September 10, 2026, describing the target as a U.S. provider of engineered flow-control solutions serving data-center liquid cooling. A September 18 report confirmed UBS was providing acquisition financing, though loan terms and size were not disclosed.

IMPLICATION

This watch asks whether HVAC and thermal incumbents are buying the immersion category. The answer from the period is: they are buying liquid cooling broadly, not immersion specifically. This matters because it suggests incumbents are hedging across architectures rather than concluding that immersion will dominate. The trigger condition — an acquisition of an immersion vendor — has not been met, and both deals are more consistent with a direct-to-chip-led market than with an immersion inflection.

RECOMMENDED ACTION

Track DCX's product mix and production volumes as they are disclosed post-close to determine whether the 176 million USD LITEON investment shifts DCX's roadmap toward immersion or toward direct-to-chip; if the

next DCX product announcement focuses on cold plates rather than tanks, that would confirm incumbents are directing new capital toward the competing architecture.

SOURCES & WHAT THEY SIGNAL

- [**Bloomberg: Blackstone Lands Loan for Data Center Cooling Firm Acquisition**](#) — Confirms UBS financing for the Blackstone/Flow Control deal, corroborating that the transaction is proceeding toward close.
- [**IntelliNews: LITEON Buys 25% Stake in Poland's DCX Liquid Cooling for 176 million USD**](#) — Confirms transaction size, stake size, and that DCX produces both direct-to-chip and immersion systems — establishing that the investment targets the full liquid-cooling category, not immersion alone.
- [**LITEON Strategic Investment Announcement via Yahoo Finance**](#) — Primary LITEON announcement confirming the investment in DCX as a Warsaw-based liquid-cooling provider for AI and HPC data centers.
- [**Blackstone Agreement to Acquire Flow Control Holdings via Yahoo Finance**](#) — Documents Blackstone's acquisition of a flow-control component supplier serving data-center liquid cooling, establishing PE-level interest in the infrastructure layer rather than in immersion-tank vendors.
- [**Unite.AI: LITEON Invests 176 million USD for 25% Stake in DCX Liquid Cooling Systems**](#) — Additional corroboration of the LITEON/DCX transaction terms.
- [**LITEON Announcement via ANSA/Business Wire**](#) — Corroborating source for the LITEON/DCX transaction date and characterization.

SIGNAL 4 OF 5

Intel's Xeon single-phase immersion warranty rider — covering Supermicro hardware with Submer tanks and Shell fluid — establishes the first chipmaker-backed reference architecture for immersion, but covers only CPU-class chips, not GPU-class platforms

MEDIUM Short-term (3–12 months) · [Commercial & Market Signals](#) · [Review](#)

Single-phase immersion has cleared a meaningful industry threshold: a chipmaker (Intel) has issued a production warranty rider covering a specific hardware stack, providing the OEM assurance needed for risk-averse operators — but the architecture is validated for CPU-class workloads as described in the Intel sources, and no comparable GPU-class qualification was found in public sources as of September 2026.

REASONING

The Intel warranty rider is documented in two Intel-sourced publications (a newsroom announcement and a case study PDF), making it one of the most directly verifiable events in the entire findings set. The OCP warranty guidelines and Asperitas/UNICOM procurement agreement add context but are not themselves OEM warranty announcements. The signal's importance is that it marks a qualitative shift: immersion is no longer purely a configuration that voids server warranties; at least one chipmaker has formally stood behind a named stack. However, confidence is held at Medium because the Intel announcement dates from May 2025 — before the monitoring window — and no comparable qualification for NVIDIA, AMD, or GPU-class Supermicro platforms was found in public sources as of September 2026; it is not yet known whether any such qualification has since been announced through non-public or trade channels. The gap between CPU immersion warranty and GPU immersion warranty is analytically critical because AI workloads driving the density crisis are GPU-dominated.

PATTERN

Intel published a newsroom announcement (May 13, 2025) stating validation of a full single-phase immersion solution using Intel Xeon processors, Supermicro hardware, Submer immersion systems, and Shell immersion-cooling fluids, alongside a Xeon Processor Single-Phase Immersion Warranty Rider. An Intel-hosted case study PDF (dated July 2025, indexed August 2026) confirms the same warranty rider covers Intel products deployed in the Shell/Submer/Supermicro configuration. OCP warranty guidelines (April 2024, updated 2025) establish an industry framework for warranty responsibility for immersed components but do not themselves certify specific OEM hardware. Asperitas and UNICOM Engineering announced (February 3, 2026) a non-exclusive agreement enabling single-contract procurement of immersion-cooling systems and immersion-ready servers, indicating that a commercial procurement path exists. No comparable GPU-platform immersion warranty from NVIDIA, AMD, or their ODM partners was found in public sources as of September 2026; this has not been confirmed.

IMPLICATION

For operators evaluating single-phase immersion for CPU-class HPC or inference workloads on Xeon platforms, the warranty risk has been formally addressed per the Intel sources. For AI training or high-density

GPU workloads — the applications most likely to exceed air-cooling limits — no equivalent GPU-platform immersion warranty was found in public sources as of September 2026. This gap is the most actionable monitoring target: if NVIDIA or AMD issues a comparable warranty rider for H-series or MI-series GPUs in an immersion configuration, the signal value would jump sharply.

RECOMMENDED ACTION

Monitor NVIDIA, AMD, and their ODM partners (Supermicro, Gigabyte, Quanta) for any GPU-platform immersion warranty announcement or qualification test report; this is the single OEM event that would most materially change the immersion outlook for AI infrastructure and would constitute a review trigger. Also verify whether any GPU-class immersion qualification has been disclosed through non-public or trade channels not captured in current public sources.

SOURCES & WHAT THEY SIGNAL

- [OCP Warranty Guidelines for Immersion Cooled Technology Components](#) — Establishes the industry warranty framework that makes OEM riders like Intel's viable and defines the operating context for immersed components.
- [Asperitas and UNICOM Engineering: Single Contract Path to Immersion-Cooled Compute Infrastructure](#) — Demonstrates that single-phase immersion has progressed from experimental configuration to a structured commercial procurement path, consistent with an architecture that has crossed a warranty threshold.
- [Intel Newsroom: Intel and Shell Advance Immersion Cooling in Xeon-Based Data Centers](#) — Primary chipmaker announcement confirming the Xeon Processor Single-Phase Immersion Warranty Rider and the validated hardware stack.
- [Intel Case Study: Shell-Submer-Supermicro Immersion Deployment](#) — Corroborates the warranty rider's application to the specific hardware stack and confirms Intel's support position for this configuration.

SIGNAL 5 OF 5

The only named immersion deployment identified in the monitoring period — ResetData's reported 7 MW colocation allocation — sits below the 10 MW production trigger and has not been confirmed as commissioned

LOW Immediate (0–3 months) · Commercial & Market Signals · Review

The strongest evidence of a named production immersion deployment found in the monitoring period is a reported 7 MW liquid-immersion colocation allocation for a sovereign-AI project, which has not been independently confirmed as commissioned — placing it below the threshold used in this monitoring effort.

REASONING

A single secondary-source article (Tech Times, August 13, 2026) reports the ResetData/Centuria/CDC arrangement with specific capacity figures. The article is the clearest instance in the entire findings of a named operator, a specific MW figure, a colocation context, and immersion cooling appearing together. However, the findings explicitly note that the source does not establish the 7 MW allocation as already commissioned or operational; it describes the arrangement as a deployment surface before Centuria's own facilities come online. Based on the monitoring criteria applied in this effort, 10 MW has been used as a review trigger for production deployments. This reported allocation, even if confirmed, begins below that threshold. Confidence is held at Low: the event is real (a primary article with named parties and a specific capacity figure), but it is unconfirmed as commissioned, below the trigger threshold, and rests on a single source. This is signal-level material for tracking colocation and sovereign-AI immersion adoption, but it does not constitute this watch's trigger.

PATTERN

Tech Times reports (August 13, 2026) that ResetData signed a master-services agreement with CDC Data Centres for an initial 7 MW colocation allocation, with the AI-F1 architecture described as liquid immersion cooling with GPU clusters submerged in dielectric fluid. The source describes the allocation as a deployment surface for workloads before later Centuria-owned facilities come online, not as a commissioned production deployment.

IMPLICATION

The absence in the current findings of any confirmed, commissioned immersion deployment above 10 MW means this watch's primary trigger condition has not been met. The ResetData/Centuria arrangement is the nearest candidate and should be the first item to verify against primary sources (CDC Data Centres, Centuria, or ResetData disclosures) to determine whether it has moved from contracted to operational.

RECOMMENDED ACTION

Contact CDC Data Centres and monitor Centuria's investor disclosures and ResetData's operational announcements to determine whether the 7 MW AI-F1 immersion allocation has been commissioned; if confirmed as live and expanded, it would constitute the first verified production-scale immersion deployment in the monitoring record and trigger a formal review.

SOURCES & WHAT THEY SIGNAL

- [Tech Times: Centuria Locks 165 million USD GPU Debt, 72 MW Power, Sovereign AI Pipeline](#) — The sole source reporting a named operator (ResetData), a specific capacity figure (7 MW), a colocation context (CDC Data Centres), and liquid immersion cooling — the clearest deployment candidate in the monitoring period, but not confirmed as commissioned.

PUT A WATCH ON YOUR QUESTION

A watch on your question runs every cycle.

These signals came from one cycle of a standing watch. Name a company, a market or a regulation, and the watch keeps running whether or not anyone opens the platform. Every signal arrives rated for confidence and horizon, with the dated events behind it and the sources that carry the weight.

See all the samples and tell us your question at ezassi.com/ezassi-signals-sample-library.

info@ezassi.com • ezassi.com