Why Two-Phase Direct-To-Chip Is The Winning Cooling Solution

In the last ten years, data center cooling has evolved dramatically.

Traditional Air Cooling

Chilled air circulated through servers. Struggles with AI heat densities. Highest energy consumption among current cooling methods.

Single-Phase Direct-to-Chip (1P D2C)

Uses water/glycol (PG25) or water/oil mix. Enables higher power densities and higher energy efficiency vs. air. Requires constant monitoring and frequent maintenance, increasing flow rates.

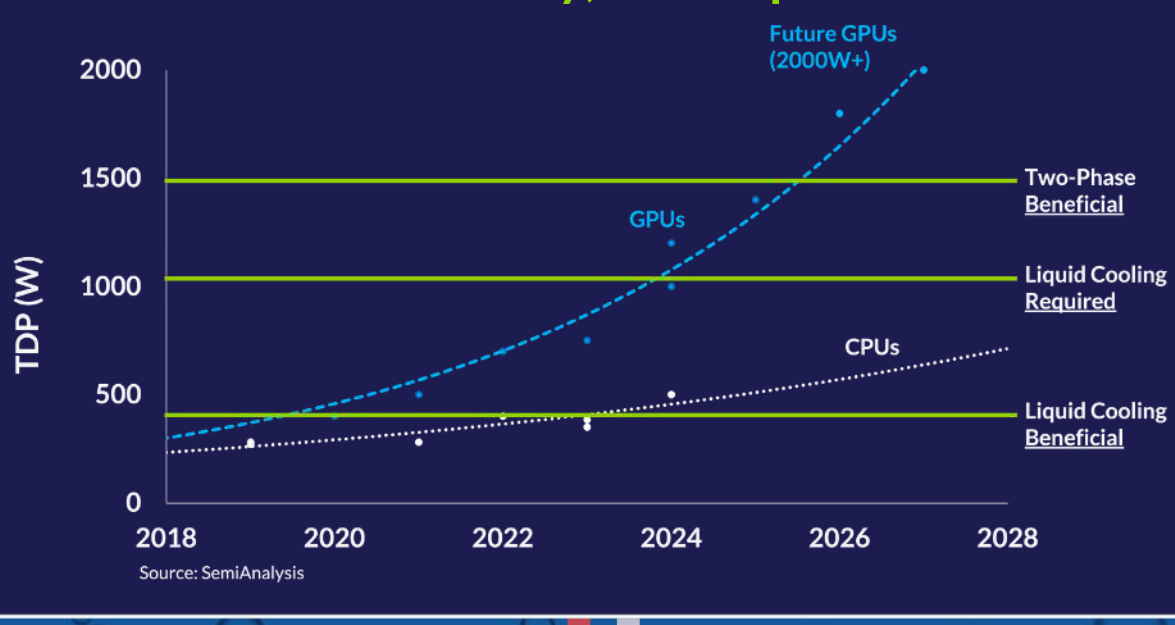
Immersion Cooling (Single-Phase & Two-Phase)

Horizontal form factor with IT submerged in "baths." Near complete heat capture, but lower thermal density vs. single-phase direct-to-chip. Requires expensive fluids and costly infrastructure changes.

Two-Phase Direct-to-Chip (2P D2C)

Boils refrigerant for latent heat absorption. Highest thermal performance. A drop-in replacement for single-phase with easy and convenient maintenance cycles.

Largely due to AI's growing thermal demands, 2P D2C is better today, but required tomorrow.



Already made the switch to single-phase D2C? 2P D2C has a similar deployment, but very different results:

Single-phase direct-to-chip		Two-phase direct-to-chip
Untenable flow rates & FW temps required for future chips	Heat Removal	4500W+ per socket; handles current & future GPUs
Conductive water/glycol; GPU damage risk of leak	Fluid Risk	Non-conductive refrigerant; zero IT equipment damage risk
Frequent monitoring; PG25 water quality testing	Maintenance	Zero fluid maintenance
Higher total cost of ownership	5-Year TCO	8-17% savings; validated by Jacobs Engineering

It's never been easier to transition to two-phase D2C. Contact Accelsius to adopt mission critical cooling today.

www.accelsius.com ACCELSIUS® info@accelsius.com