Schaffhausen, 4 November 2025

Empowering NextGen Data Centers

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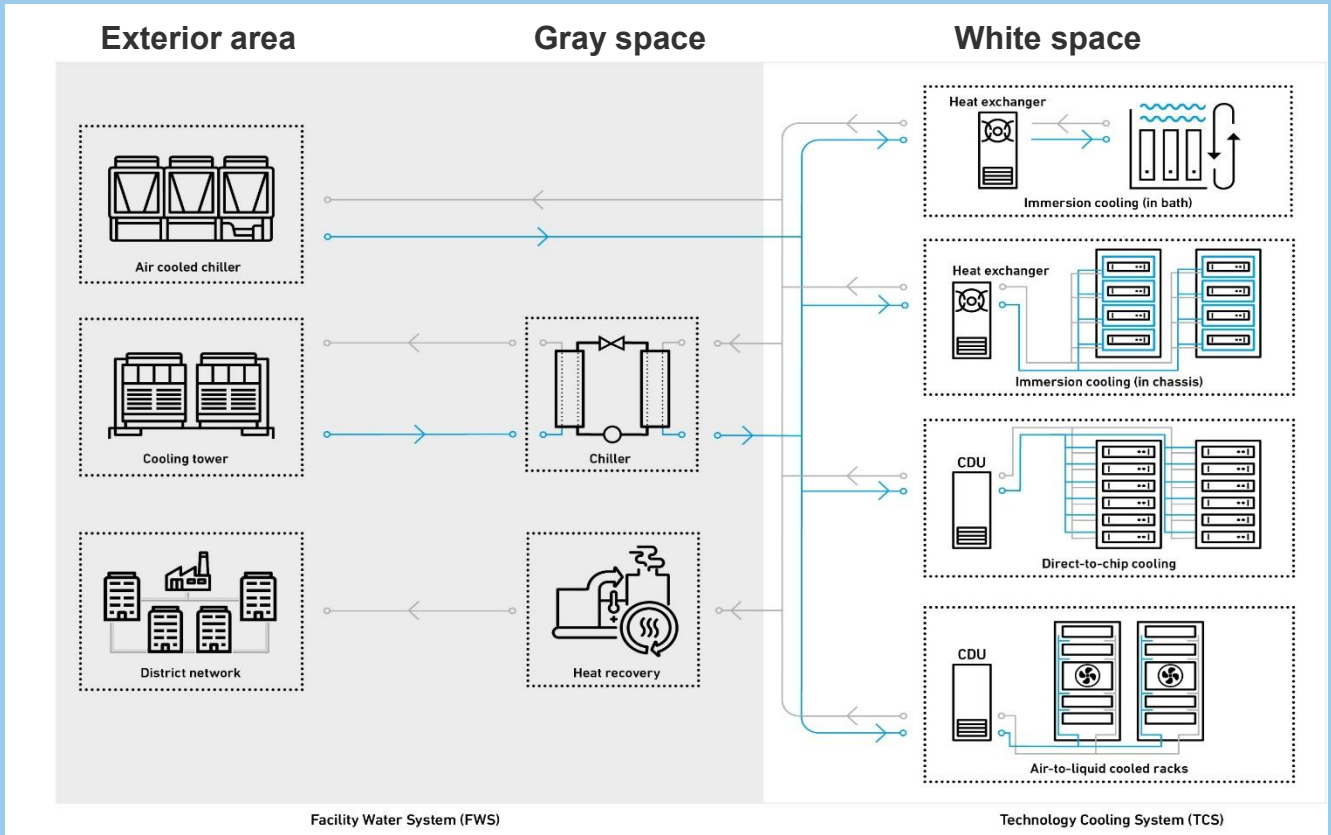
AI growth is straining the grid – and cooling is now mission-critical infrastructure



AI workloads are causing data center electricity demand to **grow 25% annually** and is expected to **triple** by **2030** in the U.S. alone.

Generative AI could **drive 40%** of total compute capacity by **2030**.

Cooling accounts for **up to 40% of energy consumption** in modern hyperscale data centers.

Every MW of AI compute requires up to **3MW** of thermal transfer infrastructure, due to high-density rack loads **(~50 to 120 kW/rack).**

Incumbent materials are buckling – and polymers are in demand

Operators are replacing piping with engineered plastics

to reduce failure risk, install time, and carbon impact.

Traditional Materials	GF Polymer Systems
Corrosion & leaks (e.g. Google Paris outage)	Zero corrosion, leak-free fusion
Heavy, labor-intensive install	Lightweight, prefabricated & fast
Limited life, frequent repair	50+ year lifecycle, proven in harsh environments
Incompatible with heat transfer fluids over time	Fully compatible, optimized for high-purity systems
High embodied carbon	Lower CO_2 footprint, ESG aligned

Key Insights

- In 2023–25, cooling system leaks and corrosion-related failures led to multi-million-dollar outages at hyperscalers like Google and mission-critical organizations like NASA.
- Today's materialsare prone to corrosion, system fouling and high installation times.
- There's atrend toward polymers for lower embodied carbon, faster installation and corrosion-free performance.
- Polymer piping offers 50%–70% lower CO_2 footprint than steel, supporting ESG mandates.

Liquid cooling system components, lightweight clean polymers

FWS

Facility Water System

Technology Cooling System (TCS)

1

Coolant Distribution Unit (CDU)

2

Distribution lines

3

Large Quick Connector

4

Hose

5

Rack manifolds

6

Universal Quick Disconnect (UQD)

7

Hose (jumper)

IT Equipment

8

Cold Plate

IT Equipment (ITE)

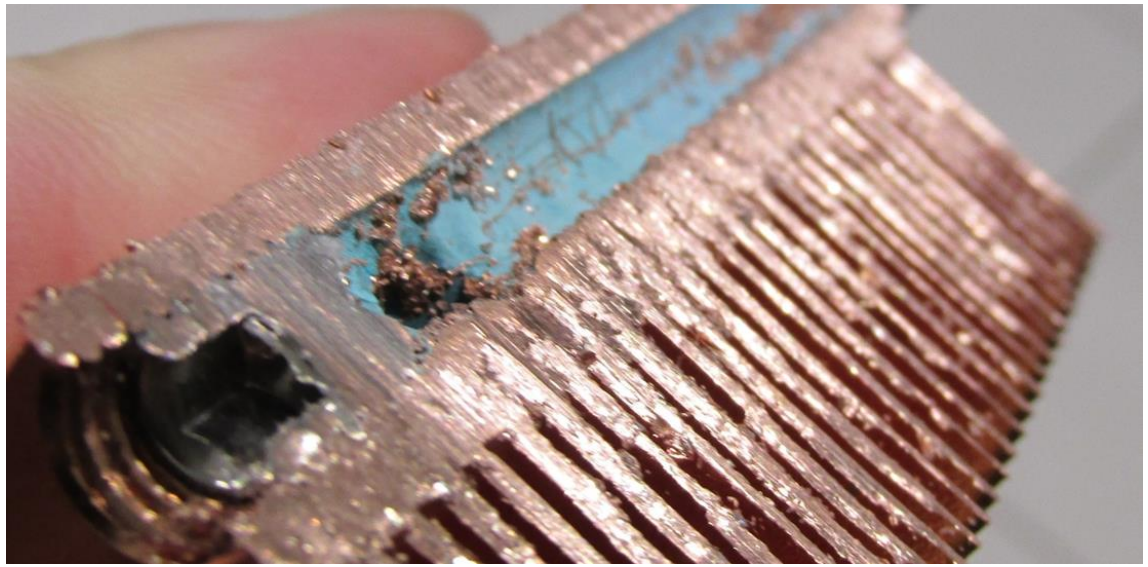
Processors, both CPUs and GPUs, interface directly with the cold plate.

The cold plate must be free of impurity.

We enable chip manufacturing with ultrapure products, now we cool “semi-pure” chips with them

UPW Filtration Skid for a Chip Fab

The SEMI F63 Standard dictates that the critical particle size for **UPW systems is below 5 nanometers**.
5 nanometers is .000005 millimeters.

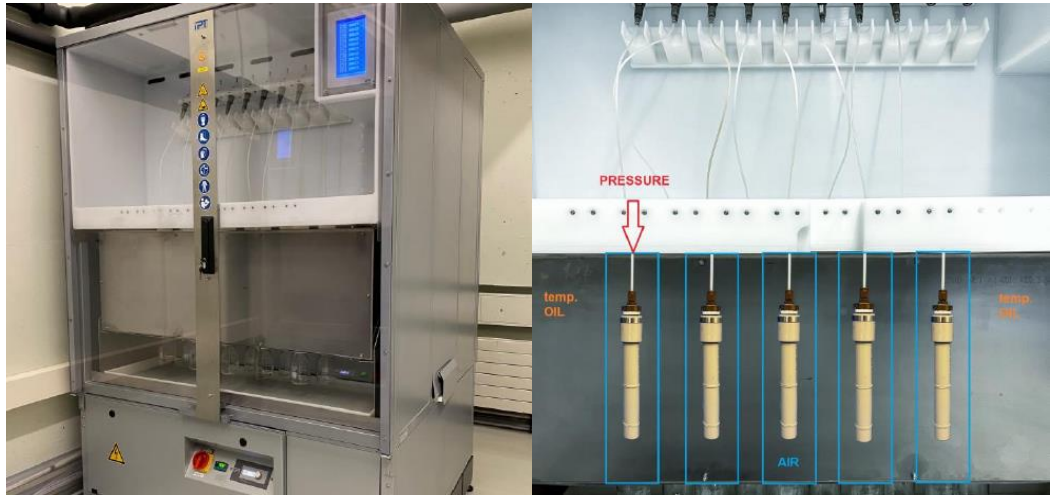


Cutaway of a Corroded Cold Plate

The data center industry filtration norm is moving toward capturing **particles at 10 microns from 25-50.**
10 microns is .01 millimeters.

Current and future coolants favor polymers for corrosion-free operation, and downtime isn't an option

Current Coolant Testing in Schaffhausen



Current Coolant Testing in Asia

25% Propylene Glycol (PG25) is the dominant coolant today

as it is inherently a biocide, inhibits corrosion and is safe to handle.

The other coolant most clients explore is Deionized Water (DI), which is a better thermal conduction medium. Ultrapure Water is actually Type 1 DI so our experience is leading edge.

Processors require clean and stable heat rejection via their cold plates, or the various costs are enormous

NVIDIA GB200
“Superchip”

NVIDIA GB200
NVL72 Rack

Fouled cold plate channels cause the processor to overheat in seconds.

Each GB200 “Superchip” costs up to $70,000. There are 72 GPU “Superchips” in a NVL72 rack plus additional “Grace” CPUs.

Current hyperscaler **SLAs are up to 99.999% uptime.** The SLA level is evolving in real time for AI leases, but downtime isn’t an option.

Traditional data center **downtime is estimated to cost up to $5M/hour.**

GF Engineering infrastructure certainty, repeatably

Data centers are now modular, prefabricated builds — various bodies estimate 60–80% of new DC components will be factory-assembled by 2030.

Engineering hubs across the globe for sunup to sundown client access

“We reduce risk from blueprint to install

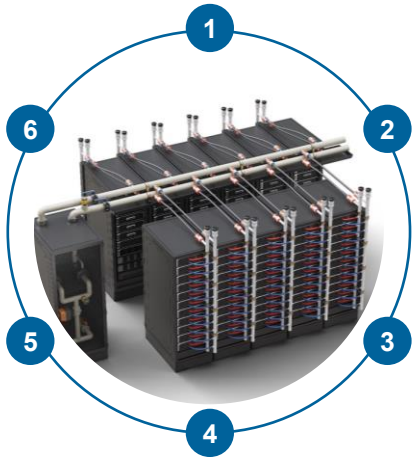
engineering infrastructure certainty at hyperscale speed.”

Global key account activities

- Heat loss & hydraulic modelling
- Stress & seismic analysis
- Specification design and compliance
- Prefabrication + field support
- NDT + FEM validation
- Market intelligence discussions

From equipment yard to rack: GF is already building the next layer

Complete solution



1. **Engineering Services**
   Design and Modeling for success
2. **Distribution System**
   Pre-fabricated Headers
3. **Quick Connect Valve 700**
   Dual Ball Valve in PVDF
4. **In-Rack Manifold**
   Custom-Designed Rack Manifold
5. **Infrared Welding**
   Ultimate reliability, purity and traceability
6. **Process Automation**
   Actuators & Flow Sensors

Technology Cooling System (TCS) is the cooling inside the rack – where AI heat is most intense

Technology cooling

- Rack power density is surpassing 50–120 kW due to AI chips — air cooling alone is no longer viable.
- Liquid cooling adoption is accelerating — GF's polymer solutions are optimized for Direct Liquid Cooling (DLC).
- CDU + TCS integration is critical to enabling DLC — and operators seek modular, repeatable leak-proof connectivity.

$13B Direct Liquid Cooling market 2030

Q&A