

OPEN POSSIBILITIES.

Liquid Cooling Integration and Logistics (Cold Plate)



OCP
GLOBAL
SUMMIT

NOVEMBER 9-10, 2021



ADVANCED
COOLING
SOLUTIONS

Liquid Cooling Integration and Logistics (Cold Plate)

Nigel Gore, Senior Global Offerings Manager, Vertiv

Matthew Archibald, Director of Technical Architecture, NVENT

OPEN POSSIBILITIES.



Why Liquid Cooling?

- As more high-power racks are deployed, air cooling becomes untenable from an economic and sustainability perspective.
- Bringing liquid to the rack can **increase the capacity and efficiency** of data center cooling.
- Liquid cooling leverages the higher thermal transfer properties of water or other fluids to support **efficient and cost-effective** cooling of high-density racks.

OPEN POSSIBILITIES.



Why Integration and Logistics?

- Increasing interest to deploy liquid cooling.
- Insights and guidance to life cycle considerations to deploy are often not disclosed or available resources.
- Life cycle touches on multiple discrete practices including manufacturing, transport, pre deployment integration and deployment practices.
- The whitepaper specifically focuses on liquid cooling using cold plates integrated into the server, rack liquid manifolds and coolant distribution units

OPEN POSSIBILITIES.



Scope: Logistics & Integration



Manufacture

Server manufacturing
Levels (L1-10)
Rack Integration (L11-12)

Server Assembly, Cold
Plate Integration, Rack
Manifold Functional Test

Quality Assurance
Gaseous testing
Visual inspection



Transport

Server Assembly Cold
Plate and rack manifold
preparation

Packaging
Design, Handling, Labelling

Airfreight, Sea freight,
Road transport options



Integrate

Server Assembly Cold
Plate, rack manifold, in-
rack CDU preparation

Server Assembly Cold
Plate, rack manifold, CDU
Testing

Storage options
Ship to DC



Deploy

Delivery
Inspection
Preparation

Installation,
Commission and
Start-up.

Operation,
Maintenance and
decommission

OPEN POSSIBILITIES.



Manufacture



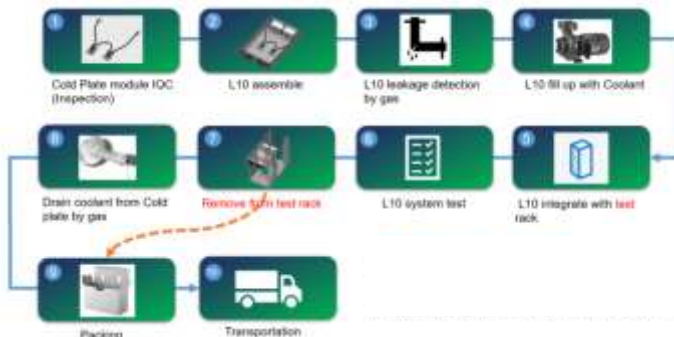
Manufacture

Server manufacturing
Levels (L1-10)
Rack Integration (L11-12)



Server Assembly, Cold
Plate Integration, Rack
Manifold Functional Test

Quality Assurance
Gaseous testing
Visual inspection



OPEN POSSIBILITIES.



Transport



Transport

Server Assembly Cold
Plate and rack manifold
preparation



Packaging
Design, Handling, Labelling



Airfreight, Sea freight,
Road transport options



OPEN POSSIBILITIES.

Images licensed under [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/)



Integration

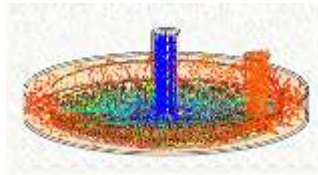


Integrate

Server Assembly Cold Plate, rack manifold, in-rack CDU preparation



Server Assembly Cold Plate, rack manifold, CDU Testing



**Storage options
Ship to DC**



OPEN POSSIBILITIES.

Images licensed under [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/)



Deploy

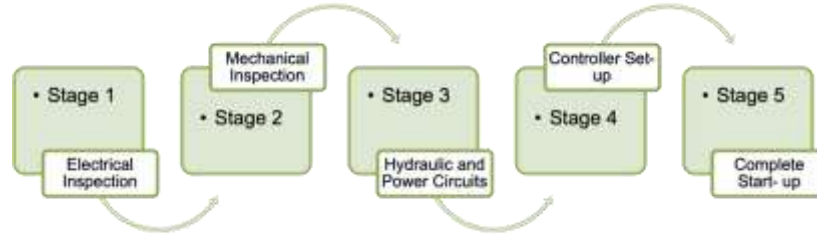


Deploy

Delivery
Inspection
Preparation

Installation,
Commission and
Start-up.

Operation,
Maintenance and
decommission



OPEN POSSIBILITIES.

Images licensed under [CC BY-SA](https://creativecommons.org/licenses/by-sa/4.0/)



Closing Summary



Manufacture

Server manufacturing
Levels (L1-10)
Rack Integration (L11-12)

Server Assembly, Cold
Plate Integration, Rack
Manifold Functional Test

Quality Assurance
Gaseous testing
Visual inspection



Transport

Server Assembly Cold
Plate and rack manifold
preparation

Packaging
Design, Handling, Labelling

Airfreight, Sea freight,
Road transport options



Integrate

Server Assembly Cold
Plate, rack manifold, in-
rack CDU preparation

Server Assembly Cold
Plate, rack manifold, CDU
Testing

Storage options
Ship to DC



Deploy

Delivery
Inspection
Preparation

Installation,
Commission and
Start-up.

Operation,
Maintenance and
decommission



OPEN POSSIBILITIES.



Call to Action

- ACS Workstream: <https://www.opencompute.org/projects/acs-cold-plate>
- Advanced Cooling Facility Workstream:
<https://www.opencompute.org/projects/advanced-cooling-facilities-incubation>
- Whitepaper: <https://www.opencompute.org/documents/ocp-liquid-cooling-integration-and-logistics-white-paper-revision-1-0-1-pdf>

OPEN POSSIBILITIES.



Open Discussion



OCP
GLOBAL
SUMMIT

NOVEMBER 9-10, 2021