

Switch Datacenters, a European data center operator providing build-to-suit corporate data centers and [colocation services](#), announces the deployment of an in-house developed data center cooling system at its Amsterdam colocation facility, Switch AMS1. The company's recent R&D efforts have resulted in this new cooling solution, which is calculated for an ultra-low pPUE of 1,04 – designed to meet dynamic and demanding requirements from applications including online gaming, cloud computing and Internet of Things (IoT).



Primary air is being circulated through Switch Datacenters technology and air handling units (photo) on the rooftop

The patented cooling system deployed is actually an indirect adiabatic cooling technology featuring an innovative synthetic heat exchange component. With this technology implemented, each aisle has its own air socks connected to air handling units on the facility's rooftop – 32 units in total – with a plenum in between. The deployment is part of a planned expansion of the Switch AMS1 facility in Amsterdam, offering an extended capacity of about 400 data center racks on the second floor of the building. For its build-to-suit and hyperscale data center offerings, Switch Datacenters has also developed a highly modular thus easy-scalable version of its newly developed indirect adiabatic cooling technology. Switch Datacenters expects this second product version to be ready for deployment in Q1 2017.

Indirect Adiabatic Cooling

Adiabatic cooling actually is the process of reducing heat through a change in air pressure caused by volume expansion. The way it's done varies. Switch Datacenters' rows of racks don't have the traditional cold-aisle setup. Instead, the data hall as a whole gets chilled while the air from the hot aisle is being circulated.

Switch Datacenters' new technology makes sure that warm, primary air from the equipment inside the racks is being circulated through air ducts in the synthetic heat exchanger. **As the hygroscopic layer on the surface of the primary airside is kept moist, a second airflow (process air) going in the opposite direction evaporates the moisture from the hygroscopic layer.** This evaporation process allows for a highly energy-efficient cooling of the equipment. While the cooled primary air is then guided to the cold aisles of the racks again, the process air gets emitted to the atmosphere.

From its two data centers in Amsterdam, Switch AMS1 and Switch AMS2, Switch Datacenters provides build-to-suit and hyperscale data center solutions and colocation services to a range of cloud and hosting services providers as well as corporate organizations including IBM, 3W Infra, PriceWaterhouseCoopers (PWC) and PCextreme.

pPUE = 1,04

According to Switch Datacenters' R&D engineering team, the newly developed cooling solution has a calculated pPUE (partial cooling Power Usage Effectiveness) of 1,04 – an extremely energy efficient figure.



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“To build a future-ready data center able to support high-demanding verticals including online gaming and market developments such as IoT and cloud computing, one has to think outside the box,” said **Gregor Snip, CEO and founder of Switch Datacenters**. “If you want to be at the forefront of data center technology, like us, you have to be as innovative as the engineers of Facebook and Google alike. Just buying and implementing the vendor-developed cooling solutions available in the market won’t set you apart. Our indirect adiabatic cooling technology is comparable with Excool’s cooling innovation, implemented by companies like Digital Realty, Rackspace and VIRTUS, but ours is even more efficient, I can say.”

Data Center Cooling Specs

Switch Datacenters’ indirect adiabatic cooling technology would be able to accommodate diverging multi-tenancy requirements. Although the efficiency of the cooling solutions provides the best results when combined with hot/cold aisle containment, preferably in a hot-aisle setup as is the case with Switch Datacenters, it would also be possible to utilize it in combination with stand-alone racks.

Key features of Switch Datacenters’ newly developed and deployed cooling solution:

- **Type:** Indirect adiabatic cooling
- **Cooling capacity:** 20 – 200 kilowatts (kW)
- **Redundancy:** all cooling components are designed for N+1 setup
- **Efficiency:** reduction of complexity through the use of a tailor-made smart operating system
- **Reliability:** elimination of all single points of failure through the use of this smart operating system
- **Energy-efficiency:** the new technology has a calculated pPUE of 1,04 – mainly due to the use of an in-house engineered synthetic heat exchanger with extremely low water consumption, in combination with smart separation of hot and cold airflows

“Our R&D engineering team has done a great job in developing this innovative and patented cooling solution,” added **Mr. Snip**. “It really is top of the bill. It enhances the reliability of our data centers in line with current Tier 4 setup and makes them even more efficient in terms of energy efficiency and operational costs.”