



Oasis[®] TEC provides
energy-efficient rejection
of data center heat

Sabey Data Center, USA



View of polymer tube heat exchanger operating in wet "indirect evaporative cooling" mode.

In Quincy, Washington, Sabey Data Center Properties is one of six major data centers utilizing low-cost, reliable hydro-electric power sourced from the nearby Columbia River. Sabey is also using water to their benefit as Munters' evaporative cooling technology has been installed to efficiently reject heat from the data center. There are multiple Munters Oasis Indirect Evaporative Cooling (IEC) systems installed on the roof of the Intergate, Quincy Campus.

The Munters solution

Evaporative cooling is one of nature's fundamental methods of cooling. It is the same cooling principle that our own body uses when moisture (sweat) evaporates and cools the skin. Munters Oasis IEC systems use evaporation to reject heat without adding moisture to the data center. By using hot aisle containment, hot air leaving the servers is kept separate from cool air being supplied to the servers, which facilitates usage of warmer supply air temperatures.

This also results in hotter return air temperatures, which is an excellent situation for indirect evaporative cooling solutions. With Munters Oasis IEC, the air from the data center is cooled using Munters patented Oasis polymer heat exchanger, often without the need for supplemental mechanical cooling, or water.

Case study

- Oasis® IEC helps Sabey USA Data Center save big

Advantages:

- High-efficiency cooling and pPUE of 1.07
- Annual PUE below 1.2
- Data center air fully separated from outdoor air
- Lower capital costs on mechanical refrigeration and switchgear
- Reduced back-up power



Image courtesy of Sabey Data Center Properties, Seattle WA.

Flexible Oasis IEC operation

Munters Oasis IECs operate in one of three modes, depending on the ambient temperatures. On cold and cool days, the Oasis polymer heat exchanger operates dry and simply acts as an air-to-air heat exchanger. Outdoor air (commonly referred to as scavenger air) indirectly cools the data center air by normal heat exchange, without using any water.

Once the ambient temperature rises to a certain point, the Oasis heat exchanger will not be able to provide enough cooling while operating in dry mode. When this happens, water is pumped from sumps that are internal to the air handlers to spray nozzles that wet the outside surface of the Oasis heat exchanger tubes, coating them with a thin layer of water.

The scavenger air evaporates water on the exterior of the tubes, which causes heat to be extracted from the recirculating data center air flowing internally to the tubes. In this evaporative mode, the Oasis heat exchanger will be able to cool the recirculated air, even when outdoor temperatures are quite high.

During the few hours a year when outdoor temperatures are too high and moist for evaporative cooling, a small mechanical cooling system (trim DX) supplements the evaporative cooling process to help maintain the correct temperature of air supplied to the data center. This condition, where refrigeration is required to supplement the IEC, only occurs during ambient conditions with high heat and humidity.



Image courtesy of Sabey Data Center Properties, Seattle WA.

Significant savings with Oasis IEC

To further improve supplemental cooling mode, system efficiency in the condenser coil of the trim DX is located in the scavenger exhaust airstream, after the heat exchanger and mist eliminator.

The scavenger exhaust air, because of the evaporative cooling effect, is generally cooler than the ambient temperature whenever refrigeration is required to operate.

Because Oasis IEC is a recirculating system, the data center is cooled without the introduction of outdoor air pollutants that might adversely impact the servers.

Since Quincy, WA is located in an agricultural area, air laden with dust or smoke from burning fields would otherwise impact the data hall if a direct air-side economizer was implemented.

With Munters Oasis IEC, none of this outdoor air ever gets into the data center, except through small humidity control air handlers equipped with excellent filtration.

This proven, award-winning and low energy Oasis IEC technology not only saves money all year round, but it reduces the amount of mechanical cooling compared to a traditional system design and the sizing of generator sets (from 2MW to 1,5 MW) as well as downsizing copper wire, power switching gear, etc.



An annual PUE below 1.2

In 2012 during integrated systems testing at full load, a peak PUE of 1.25 was recorded – which was a great achievement in such hot conditions. The actual running over longer periods has shown the PUE to be below 1.2. This low PUE makes Intergate. Quincy Sabey facility one of the most effective data centers in the nation.

Federal EPA ENERGY STAR® certification

In 2015, Intergate.Quincy facility received federal EPA ENERGY STAR® certification for superior energy efficiency with the highest possible green score of 100 points. The facility's Energy Star efficiency performance rating of 100 is the highest level of power consumption efficiency and represents twice the national average for data centers.

Intergate. Quincy's energy intensity, or the amount of energy the data center consumes, is 33% below the national average, according to the EPA's Statement of Energy Performance for the facility.

"Munters Oasis Indirect Evaporative Cooling systems have exceeded our expectations. We've very satisfied with both the air handlers and Munters as a company," said John Sasser, VP Operations for Sabey Data Center Properties.

Would you like to find out if Munters has a solution for your company too? If so, please visit our website, www.munters.com

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