



Case study: AirTech
Sabey Intergate.Quincy

BENEFITS

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



Image courtesy of Sabey Data Center Properties, Seattle WA

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

In Quincy, Washington, Sabey Data Center Properties is one of six major data centers utilizing low-cost, reliable hydro electric power sustained from the nearby Columbia River. Not only that, but Sabey is also using water to their benefit in another way, through their use of Munters' evaporative cooling technology which 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.

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 take advantage of evaporation to reject heat without ever adding any

moisture to the data center.

By using hot aisle containment, the hot air leaving the servers is kept separate from the cool air being supplied to the servers, which allows the use of warmer supply air temperatures. This also results in hotter return air temperatures, which

is an excellent situation for implementing an indirect evaporative cooling solution. 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.



Image courtesy of Sabey Data Center Properties, Seattle WA

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. Outside air (commonly referred to as scavenger air) indirectly cools the data center air through normal heat exchange, without the use of any water.

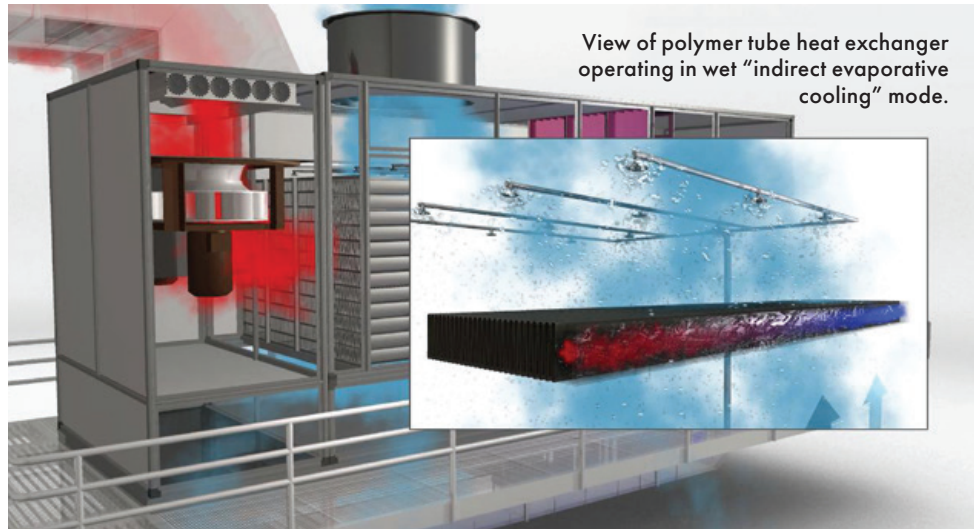
Once the ambient temperature rises to a certain point, the Oasis heat exchanger will not be able to provide enough cooling while operating in this dry mode. When this happens, water is pumped from sumps that are internal to the air handlers to spray nozzles that wet the outside surface of the Oasis heat 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 internal to the tubes. In this evaporative mode, the Oasis heat exchanger will be able to cool the recirculated air even when outside temperatures are quite high.

During the few hours a year when the outside temperatures are too high and moist for the evaporative cooling alone, a small mechanical cooling system (trim DX) supplements the evaporative cooling process, so that the air supplied to the data center is maintained at the right temperature. This condition, where refrigeration is required to supplement the IEC, only occurs during ambient conditions with simultaneous high heat and humidity.

To further improve the system efficiency in this supplemental cooling mode, the condenser coil of the trim DX is located in the scavenger exhaust air stream, 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 the Oasis IEC system 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 an agricultural area, air laden with dust or smoke from



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

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 make-up air humidity control air handlers equipped with excellent filtration.

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

Munters Oasis IEC keeps the air inside the data center completely separated from the air outside. The entry of contamination (dust, smoke, etc.) from agricultural activities is minimized. Further, this highly efficient cooling system saves in annual operating costs resulting from lower power and water consumption compared to conventional water-cooled chiller systems.

An annual PUE below 1.2

During integrated systems testing at full load in 2012, a peak PUE of 1.25 was recorded – which was a considerable 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 been very satisfied with both the air handlers and Munters as a company," said John Sasser, VP Operations for Sabey Data Center Properties.

To view the movie on the Sabey Oasis IEC, visit www.munters.com/sabey. Or to learn more about how Oasis IEC can work for you, read Munters reference list of 85MW installations and counting, or contact your local Munters data center specialist via

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