



HUMIDITY CONTROL IN A SHOWCASE FOR THE LATEST HVAC&R

CLIENT OVERVIEW

Our client exemplified the practical implementation of integrated building solutions and sustainable practices with the inauguration of their flagship structure in Metro-Atlanta, Georgia. This state-of-the-art, high-performance net-zero-energy (NZE) facility stands as a testament to their commitment to environmental stewardship and innovation. Serving as a preeminent global headquarters, this building has become a renowned destination for industry leaders and delegates from across the globe, all seeking to immerse themselves in the forefront of pioneering engineering and architectural advancements.

BENEFITS



Estimated potential saving of dehumidification with drier air for human comfort is over USD\$ 16,000 per year, equaling 160,000 kWh of energy savings. This is equivalent to 113,000 kg of CO₂ gas emissions saved – the same as burning 263 barrels of oil in the US.



THE PROJECT

In January 2020, the owner began a \$20 million renovation project on its new global headquarters building in Georgia. Built in 1978, the existing 66,770 ft² building, on 11 acres of land, became a demonstration project intended to prove the economic viability of an NZE operation. An important part of getting to NZE is the low energy consumption of the building (low energy use intensity EUI of 21 kBtu/sf/year) – while maintaining excellent ventilation and Indoor Air Quality, IAQ.

THE CHALLENGE

High humidity was reported by the Executive VP, quoting: “Humidity feels high in west side workspace (64% at 75 degrees this morning in my office). There is a noticeable temperature shift going from the foyer to the west side workspace. Foyer is 50% humidity at 75 degrees.” Condensation is a severe issue in the building that, when ignored, can cause critical dampness problems to the walls, windows, fittings, fixtures, and wallpapers. It occurs when there is a high level of humidity inside a building - it transpires when warm air collides with a cold surface.

THE SOLUTION

DOAS ERW (Dedicated Outdoor Air System, Energy Recovery Wheel comes with bypass dampers) requires in-sequence of operation to determine what priorities of its control will it give to humidity, temperature and energy. From time to time, the three variables will go into conflicts in sequence as humidity and temperature cannot be maintained at set points while having energy minimized at the same time. In the current sequence of operation, there is no priority given, hence humidity is not given a priority all the time. High humidity is often found when supply, exhaust fans, DOAS ERW and its bypass dampers do not operate in sync to keep dry air inside.