

CASE STUDY

Duty Free America



Miami Warehouse Eliminates Humidity Problems with Liquid Desiccant HVAC

Warm and humid days brought an array of air conditioning challenges to a warehouse facility at the Miami International Airport. High temperatures strained the air conditioning system and caused major maintenance issues. DFA management weighed many options, until they finally found a solution: two Advantix Systems DuTreat units.

BACKGROUND

Duty Free Americas operates stores in major international airports that sell items without duties or taxes to passengers who are leaving the country. The company's warehouse at Miami International Airport stores goods sensitive to temperature and humidity levels such as tobacco, watches, candy, chocolate and cosmetics. The large doors in the loading dock area are frequently opened to load and unload products, which allows heat and moisture to enter the warehouse. The warehouse's management team struggled to find a way to maintain cool and dry conditions despite South Florida's humid climate. Keeping items fresh for customers and the warehouse clean and comfortable for workers is essential to fulfilling DFA's commitment to customer and associate satisfaction.

CHALLENGE

The weather in South Florida, near the ASHRAE design conditions of 91°F Dry Bulb / 78°F Wet Bulb, had strained the warehouse's HVAC system to its limits. Boxes of duty-free items were stacked floor-to-ceiling in a conditioned portion of the warehouse, which required a temperature less than 73°F and humidity levels in the range of 45%.

Though the existing A/C system was configured to have enough cooling capacity, air coming in through large overhead doors, entry-ways, and standard imperfections in the building envelop created a high latent load that was too great for the aging system. As is often the case, the HVAC system could cool the air, but was not able to control the humidity. To compensate, the workers cranked the thermostat down to 60°F, forcing them to operate nearly continuously.

Not only did this consume inordinate amounts of energy and ultimately prove ineffective, but it also worsened conditions in the facility; condensation formed on the ceiling and vents, drip pans overflowed, and valuable products were degraded by water damage. Unfortunately, many HVAC systems face this same challenge in humid conditions.



ADVANTIX SOLUTION

DFA evaluated several alternatives and selected the DuTreat system, which uses an innovative liquid desiccant process to cool and remove humidity from the air using minimal energy.

Advantix Systems delivered a product that not only eliminated all humidity and condensation problems, but also reduced energy consumption by over 35%. Two Advantix Systems' DuTreat units were installed in the facility, alongside two existing conventional air conditioning units making it possible to maintain constant conditions of 73°F and 45% relative humidity. The units each process 800 cubic feet per minute (CFM) of air.

Moving the air from the DuTreat units through the existing air conditioning systems made it possible to utilize the existing ductwork, reducing the cost of the installation. The DuTreat units cool and remove the humidity from the air, providing comfortable conditions while allowing the air conditioning thermostat to be set to 73°F so that it rarely operates. The DuTreat units take in return air at a temperature of 76°F and 52% relative humidity and provide treated air at 71°F and 29% relative humidity. The lower humidity level in the warehouse reduces moisture-related damages and prevents growth of mold and mildew.



The workers in the warehouse were pleased with the improved indoor air quality and noted that the air inside the warehouse now feels like "mountain air." Additionally, the merchandise was better preserved, the energy bill dropped significantly, and the company saw a substantial bottom-line improvement for the facility.

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"Advantix Systems' dehumidification and cooling systems treat humidity effectively and efficiently, which translates directly into real economic value for our customers," states Trevor Wende, VP at Advantix Systems. "This technology uses an energy short-cut, which translates into a smaller total A/C load, lowered energy costs, and better conditions in the space."

HOW IT WORKS

Advantix Systems' cooling & dehumidification systems are based on liquid desiccant's natural removal of moisture from air. This non-toxic, brine solution cools, dehumidifies and cleans the air at the same time without ever needing to be replaced and without exiting the system. When heated, the liquid desiccant releases the moisture back outside in the form of warm, vapor air, eliminating condensation from any point in the system. Liquid desiccant is also a natural disinfectant, eliminating bacteria, microorganisms, and odor from the air in just one pass.



For more information:
e-mail: info@advantixsystems.com
phone: 305.503.0446
www.advantixsystems.com