

HVAC Pretreatment Dehumidification



Technology Overview

Precise humidity control in buildings reduces airborne pathogens and improves indoor air quality. This retrofit technology controls a building's humidity level by treating outside air before it enters the HVAC system. Decoupling humidity control from heating and cooling enables improved indoor air quality management while reducing energy consumption through integrated heat recovery design, lower peak chilled-water flows, and more efficient unoccupied operating modes. The system's small footprint and absence of moving parts simplify its incorporation into existing buildings and O&M practices. Lastly, because it removes moisture before it enters the building, it can extend HVAC equipment life.

Why is GSA Interested?

Research has shown that humidity levels between 40%-60% reduce the spread of respiratory illnesses, including COVID-19. Increasing outside air ventilation also reduces airborne pathogens but doing so can make it more challenging to control indoor humidity levels. This technology can increase the overall dehumidification capacity of air handlers without the need to augment the capacity of the existing air handler or chiller systems. It can also enable higher outdoor airflow rates with no energy penalty.

How Will Success Be Measured?

The testbed design will assess three key manufacturer claims: 15% HVAC savings; improved indoor air quality; and payback of less than 10 years.

Additional criteria to be evaluated include O&M impact; potential for extending HVAC equipment life; and the ease of installation.

Deployment Potential

This technology is applicable to chillers, which are responsible for cooling the majority (~80%) of GSA floor space. It is best suited to facilities in humid climates.

Green Proving Ground (GPG), in association with a Department of Energy national laboratory, is evaluating the real-world performance of Pretreatment Dehumidification in federally owned buildings within GSA's inventory. The technology will be provided by Altaire (Ellisville, MO) with support from Academy Energy Group (Newburgh, IN) and coordinated with other ongoing evaluations of this technology.