# Economical Humidity Control: An Alternative to Reheat

W.R. Beckwith

## ABSTRACT

*Humidity control in buildings is an often neglected and misunderstood aspect of operations. However, the ramifications of humidity are so dynamic and significant that they must not be ignored. Humidity in buildings affects the comfort and health of occupants. High humidity allows the growth of microbiological contamination in ductwork, carpet, and walls, resulting in musty odors, allergic reactions, and the accelerated deterioration of building materials. High humidity allows airborne pathogens to survive and thrive, allowing easy transmission from one person to another. High humidity reduces the performance of all types of air filters, copy machines, and computer printers. Finally, because human comfort is a combination of both air temperature and relative humidity, high humidity causes increased energy consumption in HVAC systems due to lower thermostat settings. Some of the latest ASHRAE research focuses on the dynamics of moisture in buildings. This presentation looks at the latent heat storage effects of building materials and furnishings and their effect on the latent load of HVAC systems.*

*The presentation introduces a technology that combines heat-pipe heat exchangers with the concept of the run-around loop in HVAC systems for moisture removal and operating cost savings. Heat-pipe heat exchangers passively transfer heat from the return air to the supply air in an HVAC system. This provides a cooling load reduction, increased moisture removal at the cooling coil, and free reheat. This free reheat does* not *represent an additional heat load on the system. The heat pipe has no moving parts and requires no power input.*

*The heat pipe provides an economical way to increase fresh air ventilation, provides drier air in the ductwork and maintains the relative humidity in the space between 40% and 60%, which is the healthy range according to all federal health agencies.*

*In utility-monitored projects, heat-pipe heat exchangers have demonstrated operating cost savings of 80% and peak demand reductions of 78% when used to replace electric reheat systems.*

**William R. Bechwith** is director of the Air Quality Engineering Department, CGM Services, Inc.