TOPIC: Combating COVID-19 with Healthy Ventilation Rates

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As the novel COVID-19 continues its global spread, the importance of ensuring healthy indoor air quality is paramount to helping lower the curve of infections. Studies have demonstrated higher ventilation rates have a direct impact on lowering the spread of microbials in workplaces and other occupied spaces. ASHRAE Standard 62.1, Ventilation for Acceptable Indoor Air Quality, specifies minimum ventilation rates and other measures for new and existing buildings to provide acceptable indoor air quality that minimizes adverse health effects.

Demand control ventilation (DCV), which adjusts outside ventilation air based on the number of occupants and the ventilation demand those occupants create, is seen as a convenient solution to satisfy ASHRAE 62.1. However, this type of control is often left to the end user with few specific guidelines to calculate the correct ventilation rate. This creates control levels that are subject to interpretation and often inaccurate.

If building operators are currently using demand control ventilation, ASHRAE 62.1 states that when the building is occupied, no less than the amount of air necessary to meet the building component must be introduced anytime the space is occupied. To ensure a healthy environment, more outdoor air intake will help slow the spread of bacteria and viruses. Facility managers should increase the outside air setpoint to bring in more outside air.

The benefit of higher levels of outside air intake is it will help slow the rate of microbial growth – including viruses such as COVID-19. Outdoor air intake is one of the most difficult air measurement applications and is often done incorrectly. System designs are typically 500 feet per minute for 100% outdoor air. However, end users typically want to control to the minimum rate, which is often set as low as 10% outdoor air. At that rate, the velocity of 50 feet per minute is much lower than prevailing outside breezes and is very difficult to measure accurately when national average wind speeds are closer to 11 miles per hour.

When CO2 levels are being measured in the return air as opposed to in an area near breathing level, it will show a lower CO2 indication than what occupants are breathing. Also, considering the fact that outside air CO2 levels continue to rise, precise measurements of outdoor CO2 levels along with indoor CO2 levels are critical to maintain differential PPM calculations. When only an indoor level is used for a differential calculation based on assumed outside air CO2 levels that have gone up, the effect is less outside air is being introduced to the space. Building owners and facility managers should review their operating sequence in the interest of safeguarding occupant health and safety. For example, if the building's sequence has a max or target CO2 setpoint of 1100PPM or more above background, consider reducing that target to introduce more outside air.

Facility managers should also check that outside air intakes, air measurement stations and outside air dampers are working correctly, and that air filters and moisture eliminators are clean and free of obstructions.

While these efforts may increase the energy cost to condition spaces it is the most cost effective and socially responsible way to keep schools, universities and places of business free from the spread of colds, flu and unwanted viruses, including COVID-19.