

Coronavirus

How Facilities Managers can utilize HVAC to help mitigate the risk



WHAT EVERY FACILITY MANAGER SHOULD KEEP IN MIND IN THE FACE OF CONCERNS - REAL & IMAGINED

Airborne transmission mostly occurs in indoor environments where people spend over 90% of their time. Increasing ventilation rate (Air Change Rate - ACR) is believed to reduce the cross infection of airborne transmitted diseases by removing or diluting pathogen-laden airborne droplet nuclei.

Higher ACR dilutes the contaminated air inside the rooms more rapidly and decreases the risk of cross infection. Unless natural ventilation is an option, increased ventilation rates are achieved by running the HVAC-system continuously 24/7 on at least 80% of maximum airflow if continuous air movement is not already in use.

The entire system may be rebalanced for tradeoffs in ACR between controlled spaces in regards to pressure cascades to maintain protection areas. Secondary factors, such as insuring minimized bypass throughout the entire system may have a contributing impact in less than optimized systems. Although systematic studies have produced a wide range of findings.

Coronavirus Guidance for Facilities Managers

PREVENTION STEPS

According to the well-used Wells-Riley equation for mathematically modeling the infection risk factors for airborne disease transmission, the probability is inversely correlated (proportional) to the ventilation rate. Ventilation is one of the most important means to control the cross-infection by removal or dilution of virus-laden aerosols: exhaled, coughed, sneezed, etc.

All air filters have a rated efficiency. Tradeoffs between particulate removal and filter resistance are rationalized under normal conditions with the reduction of electrical energy usage as a major driver by decision makers. However, in almost all commercial buildings, HVAC units provide a chance in the total system resistance allocation

to increase ventilation rates even in the face of electing to significantly upgrade the filter efficiency; and thus add some air resistance to the system.

The bottom line being you should seriously consider upgrading your filter or combined filter efficiencies along with increasing the ACR being moved through those filter banks. Yes – your filter upgrade will likely increase their cost. Yes – bumping up the fan speed will drive up energy costs for a period of time. Pandemics have beginnings and ends. The increased costs will have a finite duration.

FURTHER READING

References that are readable, trustworthy and contain particularly useful information for facility managers being asked what is being done “on their watch” with current plant assets to minimize airborne infection consequences during pandemic mania should visit the following:

- World Health Organization Publication and Guidelines on Ventilation for Infection Control. J. Atkinson, et. al. editors. ISBN 978 92 4 154785 7 (2009).
- ASHRAE Position Document on Airborne Infectious Diseases. January 19, 2014 reaffirmed February 5, 2020.
- Ventilation Control for Airborne Transmissions of Human Exhaled Bio-Aerosols in Buildings. H. Qian and X. Zheng, J Thorac Dis 10 (2018) 2295.

ABOUT THIS DOCUMENT & AUTHOR

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