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EBTRON Insight

Make Buildings Healthy

The aftermath of the COVID-19 pandemic is an ongoing challenge for establishments to maintain high indoor air quality (IAQ) standards for occupants. The ASHRAE Epidemic Task Force (ETF) has guided ventilation and air filtration systems and protocols during the early stage of the pandemic. With the release of ASHRAE Standard 241, Control of Infectious Aerosols, a new and improved approach to creating infection-resilient buildings has been established. This new guidance can assist designers, facility managers, engineers, and building owners in making informed decisions regarding future IAQ protocols in new and existing buildings.

ASHRAE Standard 241 establishes a set of minimum requirements to reduce the transmission of diseases through exposure to infectious aerosols. This standard is based on ASHRAE's existing Ventilation and IAQ standards, such as 62.1-2022. It takes these minimum ventilation and filtration requirements and expands for further dilution, removal, and inactivation. Standard 241 highlights the importance of operational control, balancing, and maintenance of HVAC systems to operate at 62.1 and 241 airflow rates adequately. ASHRAE's core position is that effective design, installation, maintenance, and operation of ventilation controls are critical to achieving needed risk mitigation.[1]

Infectious aerosols are microscopic particles exhaled by individuals that can carry disease-causing pathogens. These particles can remain suspended in the air for hours and travel far distances, posing a risk when inhaled.[2,3,4] By adhering to Standard 241, building owners and operators can effectively minimize exposure to pathogens, including the SARS-COV-2 virus responsible for COVID-19, influenza viruses, measles, and other aerosolized agents. Every year, these pathogens affect personal and economic well-being in a significant way.

ASHRAE Standard 241 is a new approach to providing clean airflow rates; it requires a building readiness plan (BRP) that can be acted upon to take HVAC systems in the building from normal mode to infection risk management mode (IRMM). A BRP is a living document modified anytime there are operational changes, such as tenant fit out or change of occupancy. The standard is based on providing a clean airflow rate per person for specific space types. This provides flexibility and allows for modifications to achieve targeted rates.

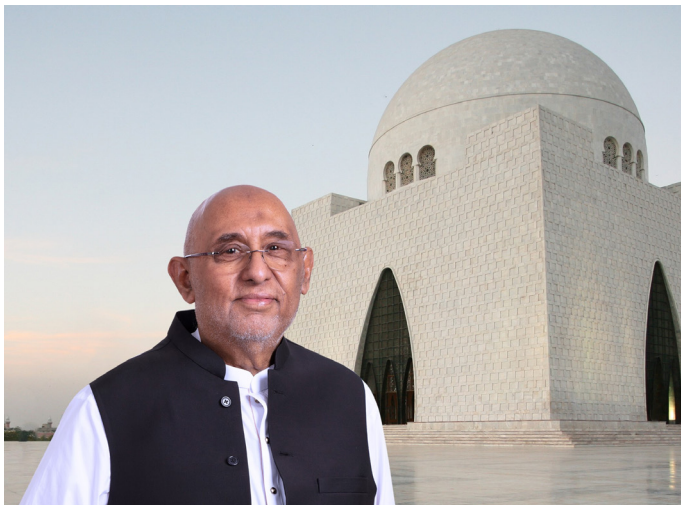
When working within existing buildings, it is necessary to assess HVAC systems to determine if the base ventilation rates meet the requirements of 62.1. Then to evaluate the feasibility of increasing clean air delivery. Finally, to ensure ventilation system controls (VSC) capability and proper operation. With EBTRON airflow measuring devices (AMDs) installed, it makes validation of this assessment an easier task. EBTRON air measurement device makes transitioning and validation in both normal and IRMM modes effortless.

EBTRON thermal dispersion AMDs provide long-term stability, repeatability, and reliability without the need for regular calibration. In addition to the initial assessment, AMDs can provide ongoing measurement and control of outdoor air ventilation rates in both modes, ensuring optimal dilution rates without unnecessary energy waste. Measuring the airflow through in-duct air cleaning systems to validate equivalent clean airflow rates (VECAi) delivered. Tracking all "in and out" airflow rates, one can determine "the pressurization flow", within spaces and the building to ensure clean to dirty airflow paths and proper pressurization. Ongoing real-time measurement is essential because HVAC airflow is easily disrupted by operational and environmental changes internal and external to the building. Various factors can impact ventilation rates, airflow delivery, and pressurization, including wind pressure, stack effect, dynamic resets, and occupancy schedules. Additional detailed information on environmental and operational impacts to IAQ is available.[5] ASHRAE also has a pending Guideline 42 Enhanced Indoor Air Quality in Commercial and Institutional Buildings.

The US Environmental Protection Agency's (EPA) "Clean Air in Buildings Challenge" and the Centers for Disease Control and Prevention (CDC) ventilation in buildings guidance are foundations for making the built environment healthier. Buildings can only maintain operation efficiency and IAQ with a plan, ongoing maintenance, control integration, and feedback from real-time measurements.

"Standard 241 represents a significant step forward in prioritizing indoor air quality," said ASHRAE Past President Farooq Mehboob. "By implementing the requirements outlined in this standard, we can improve the health, well-being, and productivity of building occupants. This standard empowers building owners, operators, and professionals to take proactive measures in safeguarding indoor environments. It's an essential tool for creating healthier indoor environments and promoting sustainable practices."

ASHRAE Standard 241, Control of Infectious Aerosols, is now available in the ASHRAE Bookstore.



2022-23, ASHRAE Presidential Member Farooq Mehboob, B.Sc

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