

Standard 241



ASHRAE Standard 241, *Control of Infectious Aerosols*

Purpose

To establish minimum requirements for control of infectious aerosols to reduce risk of disease transmission in new and existing buildings, and major renovations to existing buildings, including requirements for both outdoor air system and air cleaning system design, installation, commissioning, operation, and maintenance.

Significance

Requirements for airborne infection risk management have been absent from indoor air quality (IAQ) standards for a century, with the exception of those written for health-care facilities and laboratories. In 1895, ASHRAE's predecessor society, the American Society of Heating and Ventilating Engineers (ASHVE), published ventilation recommendations intended to reduce disease transmission that were included in a proposed 1914 model law and adopted in 22 U.S. state codes by 1922. Since the 1930s, however, IAQ standards have focused on perceived air quality and control of chemical and particulate contaminants, reducing minimum ventilation rates by half.

The COVID-19 pandemic, together with the evidence that poorly ventilated buildings can be high risk environments for airborne infection transmission, brought the adequacy of existing IAQ standards under heavy scrutiny. ASHRAE rose to the challenge of creating a comprehensive, consensus-based, code enforceable standard to mitigate the risk from respiratory pathogens by assembling a committee of international experts that spent thousands of hours in development and addressing more than 1,000 comments received.

The U.S. White House COVID19 Response Coordinator, Dr. Ashish Jha, remarked that **Standard 241 “is one of the most important public health interventions I have seen in years, if not decades.** *It is really heartening to see this organization take a central role in tackling the biggest challenges facing human health in the U.S. and around the world.”*

Scope

Standard 241 defines the amount of equivalent clean airflow met by a combination of ventilation, filtration, and air cleaning necessary to substantially reduce the risk of disease transmission during infection risk management mode, which is the operating mode when increased protection from infectious aerosol exposure is needed. A prerequisite for meeting Standard 241 is compliance with the applicable version of ANSI/ASHRAE Standards 62.1/62.2, or ANSI/ASHRAE/ASHE Standard 170 (or approved equivalent) at the time of construction or major renovation. The standard focuses on indoor long-range transmission and may not substantially reduce transmission risk in all situations due to the diversity of infectious agents and personal susceptibility.

Highlights

- ✓ Equivalent clean airflow requirements are the single most important aspect of Standard 241, which are determined by the space type, number of occupants, and met by a combination of ventilation, filtration, and air cleaning. The standard provides great flexibility to determine how to achieve compliance with the standard through various combinations of these tools.
- ✓ **The standard provides extensive** requirements for mechanical filters and air cleaners, including required testing for performance and safety. Mechanical filters must be at least MERV-A 11 or equivalent. Air-cleaner requirements are technology-agnostic.
- ✓ Safety testing requires measurement of formaldehyde, ozone, and particulate matter emissions to meet target levels.
- ✓ The standard includes extensive requirements for assessment, planning, commissioning, operation and maintenance of infectious aerosol control systems, which revolve around the development of a Building Readiness Plan.