

Preventing Transmission of Viruses with the Uniform Mechanical Code (UMC)

There is no doubt that there is a link between our health and the indoor environment. The quality of the indoor air can prevent the spread of airborne pathogens such as COVID-19. Although there is still much to be discovered about the virus, there are practical measures that can be taken within mechanical systems to help reduce the risk of infection. The UMC provides guidance on proper maintenance, ventilation, humidity, and filtration practices for mechanical systems, all of which can reduce the spread of airborne pathogens. Below are some relevant areas of the UMC that can be used for responding to COVID-19.

Maintenance (Chapter 1): A properly maintained ventilation system can help minimize the spread of pathogens such as the Coronavirus. Chapter 1, Section 102.3 of the UMC addresses maintenance of mechanical systems for both commercial and residential HVAC systems. The UMC also provides guidance on cleaning and changing of filters to avoid contaminant buildup and maintaining sufficient airflow. The UMC requires both new and existing mechanical systems to be maintained and requires regular inspections and maintenance so that the HVAC system's ability to provide acceptable indoor air quality is not compromised.

Ventilation (Chapter 4): Since COVID-19 is a respiratory illness, improving ventilation can lessen the spread of the virus. Increasing ventilation can be done by opening windows to let in more outdoor air, or by adjusting the air conditioning system. Chapter 4 of the UMC addresses both natural and mechanical ventilation. Air within a building is typically recirculated, however, ventilating with fresh outdoor air is beneficial for diluting airborne contaminants and decreasing disease transmission rates. [Research by the World Health Organization](#) has shown that poor ventilation can increase the transmission of diseases, and a virus like the Coronavirus can remain airborne as an aerosol. Table 402.1 of the UMC provides minimum ventilation rates to address contaminants that can affect the public's health and safety. Good ventilation is connected to the number of air changes per hour. Increasing ventilation in all conditioned spaces within a building to at least the minimum recommended ventilation rate significantly improves the indoor air quality and can significantly reduce the size of an outbreak.

Humidity (Appendix E): Appendix E of the UMC addresses humidification and humidity control. [Evidence from the National Center for Biotechnology Information \(NCBI\)](#) suggests that viruses may have higher survival rates in low-humidity environments and dry air may make it easier for viruses to become airborne. However, too much outdoor humidity can also support viral spread. Therefore, maintaining optimal higher humidity environments may minimize the virus' survival rate. A building's humidity can be increased through the building's heating and ventilation system to maintain a recommended ideal humidity range of 40 to 60 percent, or by installing portable humidifiers to help contain the virus. [NCBI research](#) has also shown that high temperature and high relative humidity can significantly reduce the transmission of airborne diseases. Furthermore, UV light has also been proven to kill other strains from the coronavirus family, therefore, increased UV rays from the sun or UV lights in the air handling system, air ducts, or the conditioned space has proven to slow the virus.

Filtration (Chapters 3, 5, and 6): [Research from the Centers for Disease Control and Prevention \(CDC\)](#) suggests that filtration of recirculated air may be effective in reducing transmission of airborne infectious diseases. Chapters 3, 5, and 6 of the UMC address air filters. Designing or modifying the mechanical system to implement additional air filtration is beneficial. For example, a high-efficiency particulate air (HEPA) filter can remove 99.97 percent of particles that are 0.3 microns or larger. Such filters remove dust, vapors, bacteria, fungi, and capture viral particles. Using HEPA filters with a recirculated air system can help reduce particulate concentration for improved indoor air quality.

In addition to taking routine precautions, there is no doubt that effective and up-to-code mechanical systems play an important role in creating a safe and healthy environment.