



## Ventilation and Energy Efficiency

### Verification and Repair Program for Buildings

The World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC), and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) have all recommended that, in order to protect against the spread of COVID-19 when reopening commercial, office or other buildings where members of the public work or congregate, buildings should verify that their heating, ventilation and air conditioning (HVAC) systems provide sufficient outside air ventilation and filtration<sup>1</sup>. Unfortunately, existing buildings are commonly found to not be providing the minimum acceptable ventilation rates.

To address this gap, we propose a Building Reopening Ventilation and Energy Efficiency Verification and Repair Program that would certify that a building's ventilation and filtration systems meet recommendations to protect against the spread of COVID-19. This program provides concrete implementation steps to verify that building air ventilation and filtration systems meet or exceed Occupational Safety and Health Administration (OSHA)<sup>2</sup> to the extent feasible, that meet ventilation and filtration recommendations for reopening buildings set forth by the World Health Organization, the Centers for Disease Control, and ASHRAE, as well as any applicable local and state agency building-reopening guidance. The program would also ensure that systems are operating efficiently and would identify recommendations for future efficiency and safety upgrades.

#### Assessment to be Performed by Skilled, Trained, and Certified Technicians

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<sup>1</sup> Centers For Disease Control and Prevention, Interim Guidance For Businesses and Employers Responding To Coronavirus Disease 2019 (COVID-19) (May 2020) (<https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html>); ASHRAE, ASHRAE Epidemic Task Force: Building Readiness (updated June 10, 2020) (<https://www.ashrae.org/file%20library/technical%20resources/covid-19/ashrae-building-readiness.pdf>) ASHRAE, ASHRAE Position Document on Infectious Aerosols (April 14, 2020) ([https://www.ashrae.org/file%20library/about/position%20documents/pd\\_infectiousaerosols\\_2020.pdf](https://www.ashrae.org/file%20library/about/position%20documents/pd_infectiousaerosols_2020.pdf)); World Health Organization, World Health Organization, Considerations for public health and social measures in the workplace in the context of COVID-19 ( May 10, 2020) (<https://www.who.int/publications-detail/considerations-for-public-health-and-social-measures-in-the-workplace-in-the-context-of-covid-19>).

<sup>2</sup> Occupational Safety and Health Administration (OSHA), *Guidance on Preparing Workplaces for COVID-19 - OSHA 3990-03 2020*. Mar. 2020, <https://www.osha.gov/Publications/OSHA3990.pdf>

1. **Filtration** - Review system capacity and airflow to determine the highest Minimum Efficiency Reporting Value (MERV) filtration for eliminating contagions, replace or upgrade filters where needed, and verify that such filters are installed correctly.
  - a. MERV 13 or better filtration shall be installed in the facility's HVAC system where feasible.
  - b. Determine if Ultraviolet Germicidal Irradiation (UVGI) can be installed within the ductwork and coil compartment to irradiate airborne pathogens.
  - c. Determine if ductwork requires cleaning and disinfection.
  - d. Determine if open plenums are being used in place of dedicated supply and return ductwork.
2. **Ventilation System Operation** - Physically test all ventilation components for proper operation.
3. **Ventilation Rate** - Calculation of the required ventilation rates for each occupied area based on the anticipated occupancy and physical verification that the ventilation rate meets or exceeds the minimum ventilation set forth by the local jurisdiction.
  - a. Verify the outside air inlet is clean, operational, within the allowed range of an exhaust outlet.
4. **Air Distribution** - Verify all ventilation is reaching the served zone and that there is adequate distribution.
5. **Building Pressure** - Verify a slight positive building pressure and a negative pressure for contaminant rooms temporarily occupied by sick patrons.
6. **Operational Controls** - Review of HVAC control sequences to verify systems will maintain intended ventilation, temperature and humidity conditions during operation. Verify ventilation systems are programmed to flush the building for 2 hours prior and following occupancy.
7. **CO<sub>2</sub> Monitoring** - To ensure proper ventilation is maintained during building operation, at least one CO<sub>2</sub> monitor shall be installed in each zone of the building.
8. **HVAC Assessment Report - Preparation** of an HVAC Assessment Report that includes documentation of all verifications and deficiencies.
9. **Energy and Ventilation Upgrades** - Upon completion of the HVAC Assessment Report, a Mechanical Engineer shall review and determine if upgrades can be made to the HVAC system to increase energy efficiency, filtration, disinfection and ventilation.

Increasing ventilation and filtration, or installing new technology, without a physical assessment will result in additional energy increases, premature equipment failure, and will not ensure the recommended strategies to reduce disease transmission were achieved. Physical verification and adjustment by a skilled, trained, and certified technician will ensure accurate ventilation rates, functioning filtration, and the repairs or replacements achieve design intent and energy efficiency.