

COVID-19 HVAC GUIDANCE DURING PANDEMIC RESPONSE

COVID-19 is a concern for public health globally. Given the risk to the community at large, this document provides guidance to operational teams in all segments in the United States on how to plan to maintain our clients operations regarding the impact of COVID-19 upon the performance of Technical Services activities, specifically those related to maintenance and repairs of ventilation systems.

MANAGER GUIDANCE

HVAC Management Measures

- The WHO (World Health Organization) states that studies to date suggest that the virus responsible for COVID-19 is primarily transmissible through contact with respiratory droplets, rather than through airborne routes and goes on to state “Respiratory droplets are projected up to 1 meter from a person who is coughing or sneezing. This document gives general guidance about what HVAC practices may be useful in the current business environment and especially in terms of airflow.”
- Increasing airflow in a building or space reduces the level for the COVID virus so effective cleaning and sanitizing procedures can begin and research indicates this has the greatest impact on the removal of contamination from the facility. Presently the goal is either exiting the facility or room for 72 hours or until the air is exchanged 12 times. (Note: 12 air changes of Fresh Air)
- There are certain items and processes that can be completed to increase air exchanges which are based primarily upon the specifications and capabilities of the HVAC system for that facility or room. This document will provide overall guidance; however, the unit manager or designee will be responsible for creating a unit plan which may require additional technical guidance
- It should be noted that transmission by aerosols (the COVID-19) that can be carried by HVAC systems is not proven at this stage. However, good practices for the mitigating of transmission of airborne infectious diseases were proposed by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) in [ASHRAE Community Thought Leadership on COVID-19](#).
- The guidance in the ASHRAE recommendations should therefore be applied and are summarized in the following pages.

Management Measures Relative to Increase Air Circulation/Exchange in Buildings

- The following measures can be utilized for every HVAC system:
 - If design of room pressure differentials are in place, ensure they are functioning as designed.
 - In multi-user buildings equipped with a central air handling unit, promote use of exterior air supply, and minimize air recycling (if possible, without negative implications (temperature) to occupants).
 - Avoid energy conserving strategies that reduce annualized ventilation rates (demand control ventilation). Greater use of air economizers has a positive impact on both energy conservation and annualized dilution ventilation.
 - Force HVAC systems to 24 /7 occupancy if possible, with the maximum fresh air available.
 - Allow units to run overnight to purge the facility with a complete air change.
 - It must be recognized that the COVID-19 molecules (0.125 microns in size) are too small to be effectively removed by commercial filter media (including HEPA) where the smallest molecule available for capture is approximately 0.25 microns.

Specific Actions to be taken

Create a unit plan that should include at a minimum the following steps:

- Purge the Facility with 12 exchanges of outside air or close off the space for the required 72 hours. The objective is to dilute, if not eliminate the contaminant.
- Clean the AHU. Air Handling Unit cleaning occurs after the space it serves has been cleaned.
- Clean the AHU coils with steam. Chemical cleaning agents can remain in the system.
- Clean the condensate pans and treat with Biocide tablets.
- Change the Filters.
- Continue the Purging / Air Change Operations.
- For each intervention follow recommended PPE requirements.
- Review the [Sequence for Putting On PPE](#).
- Plan specific times for HVAC maintenance.
- Consider overall objectives: increase air exchange rates, make sure system is maintained and filters are effective to the level the manufacturer has designed.
- If you are qualified and capable of measuring air exchange rates you may do so and build in specific actions for you and your team. If you are not capable of completing these calculations, you must not proceed forward. Please complete this form to request technical support: [Service Request Form for Asset Management Support with COVID-19](#)

Some Final Critical Points When Creating Your Plan

- Complete a PPE hazard assessment and ensure that you put in the right equipment.
- Clearly specify PPEs listed below and the STEPS to Safety as shown in the guidance attached below as required in the SOP for the given task: [Sequence for Putting on PPE](#).

PLAN REQUIRED PPE AND SAFETY STEPS FOR THE STAFF AS PART OF YOUR PLAN

The following COVID-19 [Personal Protective Equipment](#) must be used when cleaning the coils and changing filters:

- Goggles or Disposable full-face shield
- Respiratory (N-95) masks or higher
- For hand hygiene and safety, every time you change your protective gloves, wash your hands. Ensure there is an adequate supply of hand sanitizer available for employees as well to be used
- Ensure that waste bins with liners and lids are available for disposing of masks and debris and ensure there is a plan for disposal of this waste in accordance with CDC or Local Health Departments requirements. (Note: effective 4/6/20, CDC does not classify this PPE as hazardous waste.)
- Ensure that cleaning supplies are available, including disinfectant are available.

Air Exchange Rates

- Air changes per hour, abbreviated ACPH or ACH, or air exchange rate is a measure of the air volume added to or removed from a space (normally a room or building) divided by the volume of the space. The ACH is controlled by the HVAC system. For this effort, only Fresh Air changes are considered.
- Verify the quality and performance of the HVAC air exchange in the facility is functioning as designed.
- Every building is different, and HVAC design varies significantly between buildings, and even within buildings by area depending on design.
- For reference only, see Typical air exchange rates by building / area type
- The CDC recommends 'wait times' (in minutes in table below) necessary for air exchange to evacuate.

Appendix

This table is general guidance information and should not be used unless you can accurately calculate air exchanges within your HVAC system.

ACH	Time (mins.) required for removal 99% efficiency	Times (mins.) required for removal 99.9% efficiency
2	138	207
4	69	104
6+	46	69
8	35	52
10+	28	41
12+	23	35
15+	18	28
20	14	21
50	6	8

References

Center for Disease Control Website: [CDC Coronavirus Disease 2019 \(COVID-19\)](#)

The American Society of Refrigerating Engineers' Position Document on Airborne Infectious Diseases
[ASHRAE Position Document on Airborne Infectious Diseases](#)

ASHRAE Guidance on COVID 19: <https://www.ashrae.org/technical-resources/resources>

The CDC recommends the following guidance as a recommendation to maintain a healthy work environment
<https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html>