

ARTS, CRAFTS & THEATER SAFETY, INC

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VENTILATION IN BUILDINGS

© Monona Rossol, October 9, 2020

INTRODUCTION: The American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE) is the accepted authority for ventilation design in public and residential buildings. Schools follow ASHRAE 62.1, Indoor Air Quality in Buildings as their standard. On April 14, 2020, ASHRAE released a position paper on *Ventilation for Control of Infectious Aerosols* recommending radical modifications to existing heating and air conditioning systems (HVAC) to deal with the airborne transmission of COVID-19. In August of 2020, the two other national organizations who set standards for workplace air quality and ventilation published similar HVAC system modifications.* The experts are in agreement. As a result, our advice is as follows:

- Anyone working indoors should be aware that masks, distancing, and hand sanitizing alone will not prevent viral transmission if the ventilation is not exhausting or filtering the air efficiently.
- No one should work in buildings that rely for ventilation on any of the following:
 - open windows (no HVAC system)
 - Unit ventilators**
 - Window air-conditioners
 - air purifiers (except for large HEPA filter units in very small rooms)
- Schools meeting the old ASHRAE 62.1 standards are no longer adequately ventilated.
- Instead, three ventilation parameters must be adjusted to provide a safer environment:
 1. AIR CHANGES PER HOUR (ACH). The minimum ACH should be six which will provide a replacement (purge) of 99% of the air in room in 46 minutes. The more ACH, the better. An ACH of 12, for example, will provide a purge in 23 minutes.

MERV #	<u>MINIMUM</u> OA
17	20 %*
16	25 %
15	30 %
14	35 %
13	40 %
any #	100 %

2. FILTER GRADE (MERV RATING). The minimum grade of filter should be a MERV 13 with the MERV 17 (HEPA) being ideal. (If the system will not operate with a MERV 13, the only option is to run the system at 100% outdoor air.)

3. THE PERCENTAGE OF OUTDOOR AIR. The percentage of fresh air should be as high as possible with minimums in Table 1.

- While this set of ventilation modifications will provide a significant reduction in relative risk, every occupant should know that the risk of transmission can never be zero.
- The ventilation must be combined with testing of occupants, masking, distancing, sanitizing surfaces, and practicing good hygiene.

* AIHA (Am. Industrial Hygiene Association), *Reducing the Risk of Covid-19 using Engineering Controls*, August 2020; and ACGIH (Am. Conference of Governmental Industrial Hygienists), *Ventilation for Industrial Settings during the COVID-19 Pandemic*, August 2020.

** unless they are connected to an outside air source, deliver six air changes/hour outside air (not recirculated) to the room, and they have an exhaust port at a distant point in the room.