

CPWR – The Center for Construction Research & Training Quick Tips to Increase Ventilation at Indoor Construction Sites Without Operating HVAC Systems

COVID-19 is airborne and spreads faster and further in enclosed areas than outdoors. As temperatures drop, construction work is moving inside, work areas are being enclosed, and temporary warm-up stations are being set up. Since ventilation guidance issued by OSHA,¹ the CDC,² and other organizations largely focuses on workplaces with working HVAC systems, below are some suggestions on how to improve ventilation on construction sites.

It is important to remember that improved ventilation is only one element of a layered approach to reducing the risk of COVID-19. It does not replace the need for physical distancing, respiratory protection, face coverings, or planning to reduce the number of workers in proximity to one another.

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Tips to Improve Ventilation

- Increase the introduction of fresh outdoor air into the space by opening windows, doors, or other openings in the structure as weather permits.
- Use fans/air movers to introduce additional outdoor air and aid in the distribution of that air.
- Fan placement will vary based on room/area configuration. Air flow from one outdoor opening through a workspace to another outdoor air opening is ideal. In other words, draw fresh air into a workspace via a window or door on one side and exhaust it out of the workspace on the other side.
- Place fans so they blow potentially contaminated air away from workers. Avoid placing fans in a way that could cause contaminated air to flow directly from one person to over and around another.
- In spaces with poor ventilation or in areas of isolated air movement, use commercial quality portable High Efficiency Particulate Air (HEPA) air cleaners rated for the expected use/duty.³ Choose an air cleaner with a sufficiently high clean air delivery rate (CADR) as discussed in the EPA Technical Guidance on air cleaners.⁴
- The use of fans/air movers that introduce fresh air and include air cleaning filters (e.g., HEPA filters or minimum MERV 13 filtration) are preferred. Pedestal fans are not recommended because they are more of a mixing device than a ventilation device.
- If your fan is not designed or rated to use with filters, you should verify the actual flow rate from the fan once the filter is installed. Flow rates may be significantly reduced depending on the type of fan and the pressure drop across the cleaning device.

- ❑ Inspect and change filters according to the manufacturer’s instructions. Clogged filters decrease air flow, stress the fan motors, and reduce the filter’s ability to improve indoor air quality.
- ❑ When changing filters, treat them as potentially contaminated⁵: handle them as little as possible and wash hands afterward.
- ❑ Construction work generates traditional airborne hazards—including solvent vapors, silica dust, welding fumes, diesel fumes, and carbon monoxide—that need to be controlled by local exhaust ventilation or increased fresh air supply. Such hazards and controls should be considered when planning for ventilation to control potential coronavirus exposure.
- ❑ Consider monitoring carbon dioxide levels in the workplace. Elevated levels could indicate poor air circulation.
- ❑ Ensure mechanical ventilation equipment does not interfere with evacuation routes in the event of a fire or other emergency.
- ❑ At least six air changes per hour is a goal to reduce the virus in the air.⁶ There are several free online tools that will allow you to calculate the number of air changes per hour based on the volume of the space being occupied and the capacity of the blowers being used to introduce air into the space. Search “calculating air changes per hour.”



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¹ OSHA Alert COVID-19 Guidance on Ventilation in the Workplace -- <https://www.osha.gov/Publications/OSHA4103.pdf> accessed 12/18/2020

² CDC Ventilation webpage - <https://www.cdc.gov/coronavirus/2019-ncov/community/ventilation.html> accessed 12/18/2020

³ <https://www.epa.gov/coronavirus/air-cleaners-hvac-filters-and-coronavirus-covid-19> Accessed 12/18/2020

⁴ EPA Technical Guidance on air cleaners Page 34 :[https://www.epa.gov/sites/production/files/2018-07/documents/residential air cleaners - a technical summary 3rd edition.pdf](https://www.epa.gov/sites/production/files/2018-07/documents/residential_air_cleaners_-_a_technical_summary_3rd_edition.pdf) Accessed 12/18/2020

⁵ Nissen, K., Krambrich, J., Akaberi, D. et al. Long-distance airborne dispersal of SARS-CoV-2 in COVID-19 wards. *Sci Rep* 10, 19589 (2020). <https://doi.org/10.1038/s41598-020-76442-2>

⁶ *The National Education Association (NEA) Quick Guide to Indoor Air Quality Strategies to Mitigate COVID-19*, page 3, #5 [available online at: [NEA-Quick-Guide-to-COVID-19-and-IAQ](#)].