



**EAST-WEST**  
ENGINEERING

# Indoor Air and the Coronavirus

Robert J. Carr, P.E., LEP

Vice President

East-West Engineering, PLLC

[bob.carr@east-westengineering.com](mailto:bob.carr@east-westengineering.com)

# East-West Engineering, PLLC

- **Connecticut-Based Regional Civil and Environmental Consulting Engineering Firm**
- **CT Certified MWBE**
- **Environmental Services Includes Monitoring of:**
  - **Air**
  - **Water**
  - **Soil**
- **COVID-19 Related Monitoring Services:**
  - **Air Sampling and Testing**
  - **Surface Sampling and Testing**
  - **Preparation of Environmental Monitoring Plans**
  - **Engineering Consulting**



# Terminology and Definitions

- **ASHRAE** – American Society of Heating, Refrigerating, and Air Conditioning Engineers
- **ACH** – Air Changes per Hour
- **HEPA** – High Efficiency Particulate Air Filter, removes 99.97% of particles down to 0.3 micron
- **MERV** – Minimum Efficiency Reporting Values; the higher a filter's MERV rating, the better the filter traps particulates. Ex. MERV rating of 14 means 75% of 0.3 -1.0 micron and 90% or greater of larger particles removed
- **UVGI** – Ultraviolet Germicidal Irradiation



# Why is Coronavirus Spread an Issue in Indoor Air?

- The SARS-COV-2 virus (responsible for COVID-19) is very resilient in the environment. CSIRO Survivability Study demonstrated virus can survive up to 28 days in dark environments including money, glass, and stainless steel surfaces.
- Virus in aerosol transport can remain in indoor air for extended times and cover longer distances than 6 feet.
- Once the virus is on a surface, either by direct contact or settling from aerosol transport, particles can be reintroduced into the air if the surface is disturbed (ex. changing bed sheets, floor sweeping).



# Regulatory Guidance on Minimizing Spread of COVID-19 Through Indoor Air

- U.S. EPA in concert with the CDC and ASHRAE has developed standards and guidance related to Indoor Air and HVAC Systems.
- EPA recommends increasing ventilation with outdoor air and air filtration as important components of a larger strategy.
- EPA has issued a warning against the use of ozone generators in occupied spaces. Ozone is not effective in removing viruses and irritates airways.



# ASHRAE Guidance on Indoor Ventilation and HVAC Systems

- **ASHRAE Standard 170-2017 – Ventilation of Health Care Facilities – updated through 2020**
- **ASHRAE Position Document on Infectious Aerosols (dated April 14, 2020) - recommendations include the following:**
  - **Increase outdoor ACH rates (e.g., from 2 to 6 in patient rooms)**
  - **Use higher MERV rated filters than code minimums in high occupancy areas**
  - **Use upper room UVGI or in-duct UVGI**
  - **Maintain rooms with infectious aerosol concerns at negative pressure**
  - **Use local HEPA grade air filtration**





**EAST-WEST**  
ENGINEERING

# Questions?

Robert J. Carr, P.E. LEP

Phone: 860-709-9253

E-mail: [bob.carr@east-westengineering.com](mailto:bob.carr@east-westengineering.com)

Company Website: [www.east-westengineering.com](http://www.east-westengineering.com)

