AIRFLOW GUIDANCE

(as of 6/17/2020)

Airflow, and specifically the circulation of fresh air, for indoor spaces that are occupied by large groups for a significant amount of time has emerged as an important factor in mitigating the risk of spreading COVID-19.

It is also true that there is still much that is not known about the effectiveness of various methods to improve air quality and reduce viral spread, including HEPA and MERV air filters, UV treatment of air, and ionization. This guidance will be updated as more data emerges about potential measures and their effectiveness.

ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineer) develops guidance used by ventilation engineers and is considered the authoritative source for ventilation information:
https://www.ashrae.org/technical-resources/filtration-disinfection

There are also a lot of resources on ASHRAE's COVID-19 section, which gives their latest findings and best practices, ranked by level of evidence, as well as emerging news from the field: www.ashrae.org/covid19

With that in mind, there is general consensus around the idea that reducing the recirculation of air in a space is a positive factor in mitigating the risk of viral spread in an indoor space that is being inhabited by a large group of people for a significant amount of time.

The ideal would be to adjust or set HVAC/ventilation systems for no recirculation of air. However, many spaces may be limited in their capacity to do this, as this is not the primary function most ventilation systems were built to perform.

A recent study examining what airflow would look like in a classroom suggests reducing CO_2 to 100 ppm or less above background concentrations, calculated using the Wells–Riley equation1. This number could be refined as further data emerges, and does not account for mask-wearing.

Since each theater is different, each will need to consult a ventilation engineer or HVAC technician to make these calculations and explore steps forward.

1. S. N. Rudnick and D.K. Milton, "Risk of indoor airborne infection transmission estimated from carbon dioxide concentration" *Indoor Air*, vol. 13 (2003): 237-245. https://www.pdx.edu/green-building/sites/www.pdx.edu.green-building/files/Rudnick%20Milton.pdf. The authors found "the critical rebreathed fraction is 0.25% equivalent to a CO_2 concentration of approximately **100 ppm. above background.** Thus, very high outdoor air supply rates may be effective in limiting the spread of influenza."

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