

Idaho Energy Conservation Code Improving Indoor Air Quality for Healthier Commercial Buildings

By providing guidance for better air sealing, insulation, windows, ventilation and filtration, the current Idaho Energy Conservation Code helps to improve the indoor air quality (IAQ) of commercial buildings. Ventilation, or fresh air flow, is especially important for improved IAQ. Ventilation is classified in three ways: 1) Natural ventilation is the movement of fresh air through open windows or controlled openings, 2) Controlled ventilation is when the fresh air is managed, and 3) Uncontrollable ventilation occurs when air leaks are present in a building's envelope.

The more controlled, fresh air that circulates through the building, the healthier that building will be. For this reason, the Idaho Energy Conservation Energy Code requires air sealing penetrations in the envelope such as gaps around can lights, plumbing, or electrical outlets as well as around windows and doors.

Promoting healthier IAQ not only makes the air more breathable, it also helps to reduce pathogen spread. Now, due to the current pandemic, it is more relevant than ever to recognize the ways that building codes can help us foster healthier IAQ in commercial buildings.

Fostering occupant health through better IAQ

While IAQ has always been crucial to occupant health in commercial buildings, its significance has risen to the forefront during the current health crisis. According to Dr. Kevin Van Den Wymelenberg, Director of the Institute for Health in the Built Environment at University of Oregon, viruses can last in indoor environments for up to two weeks. This makes it paramount to ensure clean, healthy air circulates through our indoor spaces.

To this end, Dr. Van Den Wymelenberg has identified the five most important ways to reduce pathogen spread in commercial buildings. In addition to wearing masks and disinfecting spaces, three of these aspects are related to IAQ:

► **Outside Air Percentage**

Allowing fresh, outside air to circulate through a building reduces the likelihood that pathogens will linger indoors. The Idaho Building Code for commercial buildings requires compliance with ASHRAE 62.1, which outlines minimum ventilation rates and other measures intended to provide indoor air quality (IAQ) that is acceptable to human occupants and that minimize adverse health effects.

Some states have begun incorporating dedicated outside air systems (DOAS) into their energy codes. DOAS separates heating and cooling from the ventilation system, which allows for optimal and efficient control of each critical building function while circulating 100% fresh, filtered outdoor air throughout the building.

Building upon a conventional DOAS approach, very high efficiency DOAS uses the most efficient HVAC systems and design principles to provide cleaner and safer indoor air, and reduce commercial building HVAC energy use by an average of 65% compared to a code-minimum HVAC replacement.

► **Air Changes per Hour (ACH)**

Controlling ventilation through regular air changes and air sealing helps control the flow of pathogens like COVID-19. The Idaho Energy Conservation Code requires air sealing penetrations in the envelope such as gaps around can lights, plumbing, or electrical outlets, as well as around windows and doors. Sealing is typically done with caulk or foam, and results in a continuous air barrier.

► The Level of Filtration

Better filtration results in stronger blocking of particles and pathogens. Many existing air handling units (AHUs) can accommodate a MERV (Minimum Efficiency Reporting Value) 8 or possibly a MERV 10 level of filter. Replacing these filters with a higher efficiency MERV 13 or HEPA (high-efficiency particulate air) filter will most likely require a heating and cooling professional or mechanical engineer to evaluate the equipment to see if it can push air through that high of a filter rating. Note that using a filter rating that's too high will increase the use requirements of a fan, which may damage equipment. If you use a HEPA filter, consider a stand-alone air purifying unit.



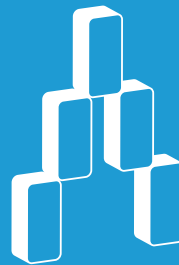
Economizers, which are a part of the Idaho Energy Conservation Code for certain types of commercial HVAC systems, allow the introduction of increased outdoor airflow when the temperature and humidity conditions are favorable to do so. Buildings with economizers have more flexibility in how much outdoor air they bring, and may more easily meet some ASHRAE recommendations in comparison to buildings without economizers.

- To learn more about Idaho Energy Conservation Code, visit idahoenergycode.com.



Further Reading and Education

- **View Dr. Van Den Wymelenberg's webinar reducing pathogen spread in commercial buildings:**
<https://youtu.be/aMmTJ9GF4qs>
- **Read ASHRAE's April 2020 paper on IAQ in commercial buildings, *ASHRAE Position Document on Infectious Aerosols*:**
https://www.ashrae.org/file%20library/about/position%20documents/pd_infectiousaerosols_2020.pdf
- **Learn more about very high efficiency DOAS:**
<https://betterbricks.com/solutions/hvac/dedicated-outside-air-system-doa>



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