ENTOUCH

Improving your profits and the planet. One building at a time.

Deterring the Spread of Viruses

Air Quality is Critical to Commercial Buildings

Air Quality is Critical:

Air quality is one of the most critical factors in commercial buildings, and now more than ever, people need reassurance they are in a safe environment.

As commercial buildings enter various stages of reopening, air quality is an essential factor to verify the buildings are operating safely and efficiently. While social distancing and handwashing are still the best-known ways to prevent the spread of the virus, addressing indoor HVAC systems to protect people from viruses is essential.

ENTOUCH is a pioneer in energy management-as-a-service and smart building technology. Our integrated, cloud-based software and technology, combined with 24/7 advisory services, render a 360° view of any facility ecosystem, fueling real-time decisions that reduce energy consumption, improve operational efficiency and extend the useful life of critical equipment for multi-site businesses across North America. ENTOUCH has collected the best available information, including the CDC and the American Society of Heating Refrigerating and Air Conditioning Engineers (ASHRAE) recommendations, to guide you through the various stages of reopening buildings.

There is not a cookie-cutter solution for remaining energy efficient during building reopening while evaluating health safety and comfort levels. Each building needs a custom solution based on the five air quality focus areas. That said, some solutions work well in nearly all situations, while others might need adjustments. Real-time monitoring helps improve air quality based on indoor and outdoor temperatures, humidity, and HVAC fresh air intake, so the holistic building health is in check.

5 Air Quality Focus Areas

FRESH AIR CIRCULATION

FILTRATION SYSTEMS

HUMIDITY LEVELS

ULTRAVIOLET GERMICIDAL IRRADIATION

AIR QUALITY MONITORING

AIR QUALITY FOCUS AREAS

FRESH AIR CIRCULATION: IS FRESH AIR BEST?

According to the CDC and ASHRAE, fresh air is essential to prevent the spread of viruses and to eliminate building pollutants, which can lead to headaches, allergy, asthma, and sinus issues.

The agencies recommend a 6 to 12 air change per hour (ACH) by opening the outside dampers to maximize the air intake. When this setting change is applied, the demand control ventilation (DCV) will need to be disabled. If the DCV or economizer is independent of the building automation system (BAS), however, it might override the current air intake setting.

ASHRAE recommends the building air intake be exchanged 2 hours before opening and 2 hours after closing for proper air quality levels. HVAC systems support approximately a 20% fresh air intake, so the increase in fresh air might result in increased temperatures, especially in warmer weather months. ENTOUCH will analyze the indoor and outdoor temperatures, humidity levels, and HVAC damper settings to maximize the fresh air intake, so people are safe and comfortable indoors.

FILTRATION SYSTEMS: FILTERS MAKE IT EASIER TO BREATHE

Filtration is a factor in establishing a healthy indoor environment, especially when attempting to reduce the spread of viruses. For air filters to mitigate virus transmission, the transmission must be airborne. Since viruses, like coronavirus, have a small particle size of 0.125um, standard filters are not effective removing airborne viruses.

Air filter ratings are based on a MERV scale ranging from 1 to 16, with 16 being most effective at capturing airborne particles. Most commercial properties and buildings, install a MERV 8 rated filter. To capture viruses, a MERV 13 or higher rated filter is more likely a better filter choice. Higher-rated filtering or even the highest-rated HEPA filter can strain an HVAC system making it work harder and therefore, be less energy efficient. While the data remains unclear as to the exact contribution an HVAC system has in spreading or capturing a virus, it is important to think through the balance of removal of particles with filter choice.

AIR QUALITY FOCUS AREAS

HUMIDITY LEVELS: IS IT RAINING INSIDE?

The ideal indoor humidity level is between 40 and 60% rH (relative humidity) to maintain a level of comfort. However, higher humidity levels have a positive impact on reducing airborne virus exposure. When the humidity level is higher, and a virus is airborne, it will attach to water droplets and increase the probability of dropping to a surface. Smaller droplets at lower humidity levels can remain airborne for more extended periods, increasing the risk of human contamination. When a droplet falls to the surface, cleaning with a disinfectant is easier. However, there are two reasons to be cautious when increasing humidity levels. First, people do not feel comfortable when humidity levels increase by more than 60%. Secondly, higher humidity levels allow other pathogens to grow, such as mold.

Therefore, maintaining the humidity level around 50% rH is ideal to balance the need to reduce the virus from the air with the need to maintain comfort for the building occupants. Leveraging advanced machine learning, ENTOUCH not only monitors but also controls humidity levels.

ULTRAVIOLET GERMICIDAL IRRADIATION: ARE ALL UV LIGHTS CREATED EQUAL?

According to the National Institutes of Health, “Ultraviolet germicidal irradiation (UVGI) is an established means of disinfection and can be used to prevent the spread of certain infectious diseases.”

The UV spectrum’s scale is from 100 to 400 nanometers (nm). The most effective UV light is UV-C with approximately a 254nm rating to deactivate microorganisms so they cannot replicate and spread viruses. Placement of the UV light solution is important as the UV light can be harmful to people who are not wearing personal protective equipment (PPE). ENTOUCH recommends implementing a UVGI solution. We suggest installing either a lighting fixture, in-duct, purpose-built appliances, or a combination depending on the building. Wall-mounted light fixtures direct the UV light upward while in-duct units are positioned either upstream or downstream depending on the HVAC system, so PPE is not needed.

The maintenance of UV light solutions is essential because when a bulb is underperforming or fails, the result is an inoperative solution, leaving your building unprotected.

AIR QUALITY FOCUS AREAS

AIR QUALITY MONITORING: IS SENSOR MONITORING THE ANSWER?

The data produced by monitoring sensors are incredibly valuable and provide real-time actionable information. Sensors are purpose-built and offer specific details to drive better business and public health decisions. ENTOUCH can monitor indoor air quality (IAQ) by measuring the total volatile organic compounds (TVOC), CO, particulates, and allergens while providing alerts or making remote adjustments to correct dangerous indoor air quality levels.

ENTOUCH recommends installing and monitoring IAQ sensors to round out a clean air strategy. The sensors are not reliable in detecting the coronavirus accurately, but they do extend the amount of data available to analyze and comingle with other building data to ensure the holistic building performance is optimal.