

SERVICE CALLS

Airborne Virus Plays a Significant Role in Covid-19 Transmission



An R&D facility called complaining of temperature problems in a walk-in refrigerator. A thermal imaging camera revealed heat infiltrating through refrigerant piping and condensate penetrations, around the edges of the door, and most significantly, through and around new LED lighting that had recently been installed to replace old fluorescent lighting. MSC sealed all penetrations and gaps, installed a new door gasket, and replaced all deteriorating caulking.



MSC received a service call for steam control issues on a clean steam generator for humidification. The customer suspected software issues, but our tech verified the interface was controlling the steam valves correctly. He instead found the 2/3 control valve positioner was malfunctioning causing the valve to jump erratically, resulting in fluctuations, alarms and shutdowns. A new positioner was installed and both valves were calibrated at 10% increments.

WE NEED TO TALK ABOUT YOUR VENTILATION SYSTEM

Since Covid-19 began its rapid spread throughout the U.S. back in March, health officials have amplified four main strategies to prevent the spread of coronavirus: wash your hands, wear a mask, disinfect surfaces, and stay six feet apart. Now, with much having been learned in the interim about the airborne transmissibility of this novel disease, these same experts have become more vocal in urging a fifth important measure effective in preventing transmission: **making improvements to building ventilation systems.** Though the [CDC and ASHRAE](#) have been recommending ventilation mitigation strategies all along, this advice is gaining increased traction now that we're becoming more knowledgeable about modes of transmission.

Based on how other coronavirus strains behave, epidemiologists originally believed that Covid-19 primarily spreads either through contact with a contaminated surface or by inhaling respiratory droplets expelled when a symptomatic person coughs or sneezes. Mounting evidence now indicates that Covid-19 may also spread through **smaller virus-containing respiratory aerosols** expelled by breathing, talking or singing – even when the infected person is asymptomatic – that float and linger in the air.



In a significant study recently [reported in the New York Times](#), a research team of virologists and aerosol scientists at the University of Florida “**succeeded in isolating live virus from aerosols collected at a distance of seven to 16 feet from patients hospitalized with Covid-19** – farther than the six feet recommended in social distancing guidelines.” Virginia Tech aerosol expert Dr. Linsey Marr called these findings “unambiguous evidence that there is infectious virus in aerosols”. Another study of more than 1,200 “super-spreader” events revealed that 96% were at an indoor venue. Researchers cited “poor ventilation” in many of these venues as a major contributor to the

(continued on page 2)

IAQ, Lower Heating Costs Among the Benefits of Building Humidification



Heating season is approaching, and once again it is time to talk about the various benefits of building humidification. In any typical year, a properly-sized, well-maintained humidification system provides numerous health, productivity, and economical benefits during the cold, dry months of winter. This winter, however, with no end to the pandemic in sight, indoor relative humidity (RH) has become much more important. **ASHRAE and the CDC currently recommend maintaining RH levels between 40-60% to help prevent the spread of Covid-19.**

Air that is properly humidified is healthier than dry air. Heating systems rob indoor air of humidity, causing mucous membranes in the skin, throat, nasal passages, and sinuses to dry out. This inhibits our ability to filter out viruses, bacteria and other pollutants and leaves us susceptible to infection and illness. Better health means higher productivity and lower absenteeism. Regarding Covid-19, ASHRAE says that while the novel coronavirus is still being studied, extensive past research has proven that dry air below 40% RH can reduce healthy immune system function, increase transmission of some airborne viruses and droplets, and increase the survival rate of pathogens.

Humidified air is more comfortable than dry air. Not only does dry air cause the discomfort of dry skin and mucous membranes, it feels colder than humidified air. When air is at the proper RH, the rate of moisture evaporation on the skin is reduced, making us feel warmer and more comfortable at a lower temperature. This enables **lower thermostat settings** and results in reduced heating costs. Other benefits include dissipation of static electricity, reduced interference with computers and office equipment, reduction of dust levels, and prevention of drying and cracking of wood furniture, fixtures and flooring.

There are **various types of humidification systems available for different environments and applications.** Most are derived from either steam (boiler steam, clean steam, canister steam, etc.) or cold water (centrifugal, ultrasonic, atomized, fogging, etc.). Each has unique advantages, drawbacks, and maintenance considerations, and they vary in energy efficiency. MSC can provide expert selection guidance, installation, preventive maintenance, troubleshooting and repairs for all types of humidification systems.

Covid-19 is Airborne

(continued from page 1)



spread of the disease.

To be clear, Covid-19 does not presently appear to be as easily transmissible via small aerosols as it is through larger droplets and contaminated surfaces. It is also true that some ventilation mitigation measures may result in somewhat higher energy bills, but most of these can be reversed once the pandemic is over. Applying ventilation improvements, especially in conjunction with proper social distancing, surface sanitization, and mask-wearing, should be prioritized right now to keep people safe and help to contain the virus. Some of these improvements include **increasing ventilation rates, increasing the percentage of outdoor air, upgrading filtration to MERV-13 or higher, repositioning supply and exhaust air diffusers and/or dampers**, as well as a number of other effective measures.

For expert advice on building ventilation improvements and additional IAQ measures that help prevent the spread of coronavirus, please contact MSC at 973-884-5000.



Get Ready for Heating Season

As summer turns to fall and we make the transition from cooling to heating, now is the time to make sure economizer cycles are working properly to take advantage of the free cool nighttime air.

Autumn is also the time to perform preventive maintenance on all of your systems. Good PM goes well beyond changing filters and belts – MSC recommends inspecting heat exchangers, balancing hydronic systems, checking heat pump systems, and checking heating controls.

If you are considering retro-commissioning, which can extend equipment life, reduce downtime and repairs, and substantially reduce energy cost, fall is the ideal time to do it.

Harvard HouseZero a Living Laboratory for Ultra-Efficiency

When the Harvard Center for Green Buildings and Cities (CGBC) made the decision to retrofit their headquarters into a prototype for **ultra-efficient green-retrofitting of existing buildings**, their goals were ambitious: to achieve near-zero energy requirements for heating and cooling, zero carbon emissions, zero electricity from the grid, zero daytime electric lighting, and 100% natural ventilation.

Known as [Harvard HouseZero](#), the 4,600 square-foot former residence built in 1924 serves as a living laboratory for twenty-five CGBC staff members and researchers working each day to address energy inefficiency in older buildings. HouseZero contains 285 sensors and nearly five miles of wiring that capture 17 million data points each day. This data, combined with current weather and future forecasts, inform algorithms that prompt the building to self-adjust its operation to control the indoor environment. These are just a few of the many advancements built into HouseZero:



- Heating and cooling largely relies on the addition of radiant surfaces and many tons of concrete mass acting as heat sinks.
- A geothermal heat pump was installed for use only during extreme conditions.
- A glass solar chimney heats up a thermal element of recycled brick, creating buoyancy-driven natural ventilation while also providing natural light.
- Natural cross ventilation is provided by windows that are fully automated to react to temperature, humidity and air quality.
- HouseZero is designed to maximize daylight use, eliminating the need for daytime artificial lighting.
- Fixed exterior window shades protect from direct sun during summer and allow winter sun into the space to reduce heat demand.
- All onsite power needs are met by rooftop solar panels.

MSC Provides Specialized Design/Build Services



Design/Build is a project delivery system in which a single enterprise delivers a complete project, from preliminary design through installation, startup and commissioning. MSC provides specialized design/build services in complex or mission-critical applications and environments. These include:

- **Refrigerant Piping**
- **Cleanrooms & Laboratories**
- **Building Automation Systems (BAS)**
- **System Reengineering**
- **Custom Retrofit/Rebuild**
- **Mission Critical HVAC**

The design/build approach offers many advantages over traditional plan-and-spec projects. A D/B contractor holds sole responsibility and serves as a single

point of contact, resulting in improved client/contractor collaboration, greater cost efficiency, fewer conflicts, faster project completion, and superior overall results.

With over 40 years of experience in intricate HVAC and building processes, MSC delivers advanced design/build solutions for clients whose projects require narrow tolerances and highest-level precision. Please contact us at (973) 884-5000 for more information.