Can Your Building System
HELP STOP COVID19?

BEST PRACTICES FOR BUILDING OWNERS

Personal protection strategies—like hand washing and social distancing—can play a major role in keeping people safe from infectious disease, but only if they operate while Indoor Air Quality best practices are maintained. Without attention to relative humidity control, proper air exchange of ventilation air, effective filtration and IAQ technology, a building's ability to minimize the spread of infection is significantly impaired.

Drawing on our experience—more than 25 years in building systems, which includes over 5,000 projects completed—we have prepared this quick guide of best practices to help you consider your options. Through this guide and assistance from Guth DeConzo, you can create the right solution to provide a healthier, safer environment for your occupants.

The human body is best equipped to fight respiratory illness when ambient relative humidity is 40-60%. Typically in winter, most buildings operate well below this optimal range.

CONTACT US

Let's meet to find your solution!

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Common PROBLEMS

DEFICIENCIES OFTEN FOUND IN HVAC SYSTEMS

Relative humidity outside ideal limits. According to numerous studies, the human body's ability to defend against respiratory illnesses is maximized when the ambient **relative humidity is between 40% and 60%**. Most buildings, however, cannot control humidity in winter—so when the cold outdoor air is brought into a building and heated to room temperature, the relative humidity plummets.

Lack of outdoor air. Thanks to a wide range of deferred maintenance issues—from broken fan belts to control failures—the amount of outdoor/ventilation air in buildings often falls well below code, design specifications, and best practices. Properly diluting indoor air with outdoor air is highly effective for reducing concentrations of infectious aerosols.

Filtration issues. HVAC filters are often misaligned, damaged, or missing. Without proper filtration, infectious aerosols can travel in the return air from one room to the entire facility through the supply air distribution system.

Improper fan operation. Supply and return fans may run at less than design speed—and therefore do not supply enough air to the space. This can affect building pressurization, allowing infectious aerosols to move from room to room.

Bathroom exhaust fans turned off. This not only reduces ventilation but detracts from the desired negative pressurization in the bathroom. Why is negative pressure important? Because toilet flushing can expel high concentrations of infectious aerosols into the air, and negative pressure keeps them from flowing to adjoining rooms.

Bathrooms should be maintained at negative air pressure when compared with surrounding spaces. This prevents the spread of infectious aerosols from toilet flushes.

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EFFECTIVE SOLUTIONS

From damper repair to UV disinfection

1. Improve current systems via repair/commissioning.

Retro- and continuous commissioning can yield fast improvements with limited investment.

- ☑ **Ensure all control elements are in working order.**
- ☑ **Inspect/repair filters.**
- ☑ **Seal ducts.** This simple step can vastly improve a fan's ability to move the air it was designed to move, from and to the correct places.
- ☑ **Seal building envelope.** With too much air leakage, proper space pressurization may not be possible. Consider sealing all gaps through doors, walls, and roofs.

2. Improve current systems via modifications/ operational change.

- ☑ **Increase outside air quantities strategically.** This typically requires use of air-to-air heat recovery systems to mitigate the energy impact of higher outdoor air levels.
- ☑ **Implement demand-controlled ventilation.** Another mature tactic to ensure adequate outdoor air. Monitors detect CO2 concentrations; as concentrations increase, the outdoor air damper is opened to allow more fresh air.
- ☑ **Improve humidity control.** Best practice, at least when respiratory illnesses are prevalent, is to maintain 40-60% relative humidity, at which the human body is best able to ward off infectious disease.
- ☑ **Improve air distribution.** Turbulent airflow can spread infectious aerosols. Review the relationship between supply diffusers and exhaust grilles to ensure smooth, uniform flow, and direct flow from "clean" to "dirty" areas.
- ☑ **Upgrade filtration.** Evaluate your filtration to implement the best available technology. Consider HEPA filtration (which may be a costly retrofit) for high- risk environments, lower-cost properly designed filters for lower-risk environments.
- ☑ **Improve room pressurization control.**
- ☑ **Install no-touch features,** including infrared operators for faucets, toilets, paper towel dispensers, and building entrance doors.

3. Use HVAC disinfection tactics.

- ☑ **Ultraviolet germicidal irradiation (UVGI).** A simple retrofit can incorporate this technology into air handling cooling coils to supplement filtration. The UV light kills viruses and other pathogens by damaging the structure of their nucleic acids and proteins.
- ☑ **Air ionizers.** Ions also disrupt the structure of microbes without harm to human occupants. Unlike many chemical disinfectants, then, air ionizers can be deployed in occupied rooms.

4. Use in-room disinfection.

- ☑ **Ozone/vaporized hydrogen peroxide.** Unlike UVGI, these chemicals can disinfect an entire room, both air and surfaces. For safety reasons, however, they should only be used in unoccupied rooms.
- ☑ **Disinfection UV lighting.** Germicidal infection control lighting systems come in two varieties: in-duct/upper room GUV (germicidal ultraviolet), which is proven effective but carries safety risks to occupants, and a visible-spectrum surface disinfecting system, which uses room light fixtures to provide continuous disinfection even in occupied rooms.

Why duct sealing?

Because leakage rates often reach 20% of total system design flow.

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TAILORED TO YOUR BUILDING

Next steps toward a customized solution

STEP 1

Conduct needs assessment to identify high-risk areas and focus on the current condition of every system element. In addition, Guth DeConzo engineers would compare design vs. actual airflow, determine the viability of installing higher MERV rated filters and UVGI, and tailor their recommendations to both short- and long-term solutions.

STEP 2

Implement low-cost and no-cost measures. With so many budgets in crisis, we believe these measures should take top priority.

STEP 3

Consider long-term capital upgrades. More complex projects—such as infection control lighting, UVGI, improved filtration, air-to-air heat recovery, and others—should be carefully evaluated to weigh the benefits in your building against the capital expenditures required.

CONTACT US

Because no two buildings are completely alike, each situation will require a multi-disciplinary solution and careful consideration of multiple tactics. Guth DeConzo would be happy to help you think through the options.

For an initial consultation, or to receive our white paper, please contact us today.

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One type of germicidal lighting uses traditional fixtures to emit a visible-spectrum surface disinfection. Its safe operation enables it to operate continuously—even when the room is occupied.

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