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## *When Can We Breathe* **EASY?**

HVAC systems are key to protect facility occupants from COVID-19 and other IAQ dangers. Pages **10**, **25** & **29**

### **PLUS:**

Facilities And Artificial Intelligence **8**

FM SOLUTIONS For 2021 **15**

Stormwater Management **34**





## CONTENTS



DECEMBER 2020

### FEATURES

- 8 TECH AND FM: AI GAINS TRACTION IN COMMERCIAL BUILDINGS**  
Facility management is seeing the benefits of artificial intelligence implementation in operations.
- 10 THE HVAC FACTOR: DIAGNOSE SYSTEMS, THEN TREAT**  
To protect against COVID-19 and other indoor air quality threats, plan steps to increase ventilation and improve filtration.
- 12 ENERGY IMPROVEMENT AIMS HIGH**  
An energy “Retro Rumble” recognizes retro-commissioning project at former Nestlé Company headquarters.
- 15 SOLUTIONS 2021: ADVANCEMENTS IN FM**  
As the new year approaches, these featured products are poised to support facility management needs.
- 25 INDOOR AIR QUALITY AND THE PANDEMIC**  
Here is a look at risk, energy use, and carbon impacts for commercial HVAC systems.
- 29 MITIGATING RISK OF AEROSOL SPREAD**  
Managing indoor air quality is more important than ever.
- 31 SAFETY IN MANUFACTURING PLANTS DURING COVID-19**  
Apply these early lessons learned to keep employees healthy in manufacturing facilities.
- 33 PARKING LOTS AND TRIPPING HAZARDS**  
Without proper maintenance, wheel stops, manhole covers, and asphalt pose threats to pedestrians.
- 34 FLOODPLAIN MODELS AND FACILITIES**  
Reduce risk and damage from floods by reassessing the conditions around building sites.

### DEPARTMENTS

- 6 EDITOR'S LETTER**
- 37 FOCUS ON:**  
HVAC, Fire Protection, Furniture, and Roofing
- 43 ADVERTISER INDEX**



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## Prescriptive HVAC: Diagnose, Then Treat

To protect against transmission of COVID-19 and other threats, plan the steps to increase building ventilation and improve filtration.

By Alan Wozniak, CIAQP, CIEC

Little doubt remains about the role HVAC systems play in spreading SARS-CoV-2. Knowing this is not enough and a blanket approach is not the most effective way to prevent the spread of COVID-19. Facility executives need a diagnosis before treatment begins. After all, doctors run tests on patients to find what ails them. Facility executives should do the same with their buildings. This prescriptive approach to indoor air quality (IAQ) must also carry through with treatment plans.

To lower the risk of spread, ASHRAE recommends increasing outdoor air ventilation. Lower occupancy levels are also necessary. These steps dilute ventilation per person. ASHRAE also recommends having a building readiness plan. This plan should outline all steps to increase ventilation and improve filtration. That plan should also include the use of air cleaning devices.

A recent University of Oregon study found viral SARS-CoV-2 RNA in samples taken from air handling units (AHUs) in a Portland hospital. Researchers found RNA in the prefilter and final filters, as one may expect. They also found it on the supply side. In fact, a startling 21% of samples from the air dampers contained viral RNA. Recent studies also show a high rate of aspergillus infection in COVID-19 patients. The possibility of simultaneous health conditions underscores the need for a complete HVAC diagnosis.

**Diagnose: HVAC Hygiene Assessment.** Maintaining the health of building occupants is the goal of any facility executive. An HVAC hygiene assessment does this. Testing the condition and performance of mechanical systems produces actionable insights. Documenting problems with filter bypass and leakage is important as well. Fouled coils and restricted airflow need correcting. Environmental sampling is another important tool. It gives facility management professionals the data they need to maintain and restore their systems.

Indoor environmental quality testing in the occupied space looks for the presence of bacteria, fungi, viruses, and other indoor contaminants. It also provides information on temperature, relative humidity, carbon dioxide, and TVOCs. Finding the cause of an IAQ issue makes a targeted treatment plan possible.

**Treatment: HVAC Cleaning and Restoration.** HVAC treatment involves several methods including steam cleaning of the evaporator coil and AHU. This high-temperature steam treatment kills allergens, bacteria, mold, viruses, and other microbials. Additionally, the force of the spray reaches deep inside the coil to push debris through to improve airflow, static pressure, and cooling capacity. Steam cleaning restores the AHU performance to near factory specifications. This has the added benefit of lowering energy costs.



Steam cleaning air handling units in HVAC systems helps to restore performance to near factory specifications, while also helping to lower energy costs.

The next step is HVAC restoration which is between 10% to 35% the cost of new replacement. This process uses high performance, anti-viral and corrosion resistant paint to coat HVAC components. This includes blower motor assemblies, evaporator coils, drain pans, structural rails, and the cabinet itself. The flexible coating protects against corrosion and rust. It also stops the growth of bacteria, mold, and viruses. The final step in HVAC restoration is the address the insulation in the cabinet and plenums. Fiberglass insulation degrades. Particles are sent downstream either into the filters and coils or into the occupied space. This insulation can be preserved with encapsulating paint or be replaced with a zero-porosity, fiberglass free option.

Other restoration upgrades include replacing air dampers, compressors, and controls, as well as retrofitting the old blower and motor with a new ECM fan array. A fan array retrofit greatly reduces maintenance and provides built in redundancies.

Improving the health of HVAC systems improves the health of building occupants. It is the front-line defense against infectious spreads. It is also critical for risk management. The technologies outlined in this article disinfect and restore mechanical systems to optimize indoor air 24/7. To ensure buildings stay safe, IAQ monitoring is another effective tool. Using a combination of products and services is the best way to diagnose and prescribe HVAC solutions.

### Creating A Self-Healing Building

Bipolar ionization reduces airborne pathogens, particles, and odors to help create a self-healing building. Using needlepoint bipolar ionization technology to clean air is the logical next step in the fight against viral infections. It supports the time and money





Team working on RTUs at the Javits Center in New York City to restore the over one million square feet of the facility back to civilian use after being used as a COVID-19 field hospital.

already spent on disinfection and restoration methods. Most important, it continually works to keep the environment safe and ensure occupant well-being.

Needlepoint bipolar ionizers mounted in HVAC equipment release positive and negative ions. These ions seek their oppositely

charged counterpart to bond with. In the specific case of a virus, the ion attracts hydrogen ions from the cell rendering it inactive. Needlepoint bipolar ionization is also effective in reducing bacteria and mold spores. It minimizes odors in a similar way. Furthermore, it works against dust, pollen,

smoke, and other particulates by clumping them together for easier filtering.

ASHRAE first published the benefits of ionization over 50 years ago. However, much emphasis has been placed on ultraviolet light. Ultraviolet light or ultraviolet-C are great in some situations. That said, these devices are only effective in areas they can reach or if the wavelength dwells on a pathogen for a certain time period. And, UV/UVC cannot be used directly where occupants are. Needlepoint bipolar ionization distributes ions throughout the entire HVAC system and into occupied space. Most importantly, it continually works to keep environments safe. ■

*Wozniak is the CEO for Pure Air Control Services, Inc. Since 1984, the company ([www.PureAirControls.com](http://www.PureAirControls.com)) has performed IAQ and HVAC restoration services across over 600 million square feet in more than 12,000 buildings worldwide.*

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