HVAC STRATEGIES FOR COVID

TECHNOLOGY SOLUTIONS FOR HEALTHIER SPACES AND BETTER INDOOR AIR QUALITY

ARISTA

HVAC CAN CONTRIBUTE TO HEALTHIER SPACES

More than any other time in recent memory, the COVID pandemic has made New Yorkers sit up and pay attention to healthy indoor air quality.

Because we can't see the viruses, bacteria, VOCs and other airborne pollutants in the air we breathe, it can be easy to overlook the risks they pose to our health and safety. But since COVID invaded our homes and workplaces, it's obvious that we can't ignore indoor air quality when we care about our health and that of others who share our spaces.

And when it comes to indoor air, the first place to look for solutions is our HVAC systems.

In this guide, we will review some HVAC design and technology solutions that can help reduce the chances of COVID transmission in buildings, and also improve overall air quality. We'll cover technology that has been shown effective at inactivating 99.9% of COVID-19 virus particles. You'll learn the benefits, the downsides, and how to make the right choices for your space.

But first, let's address the top question customers ask us about COVID-19 and HVAC.

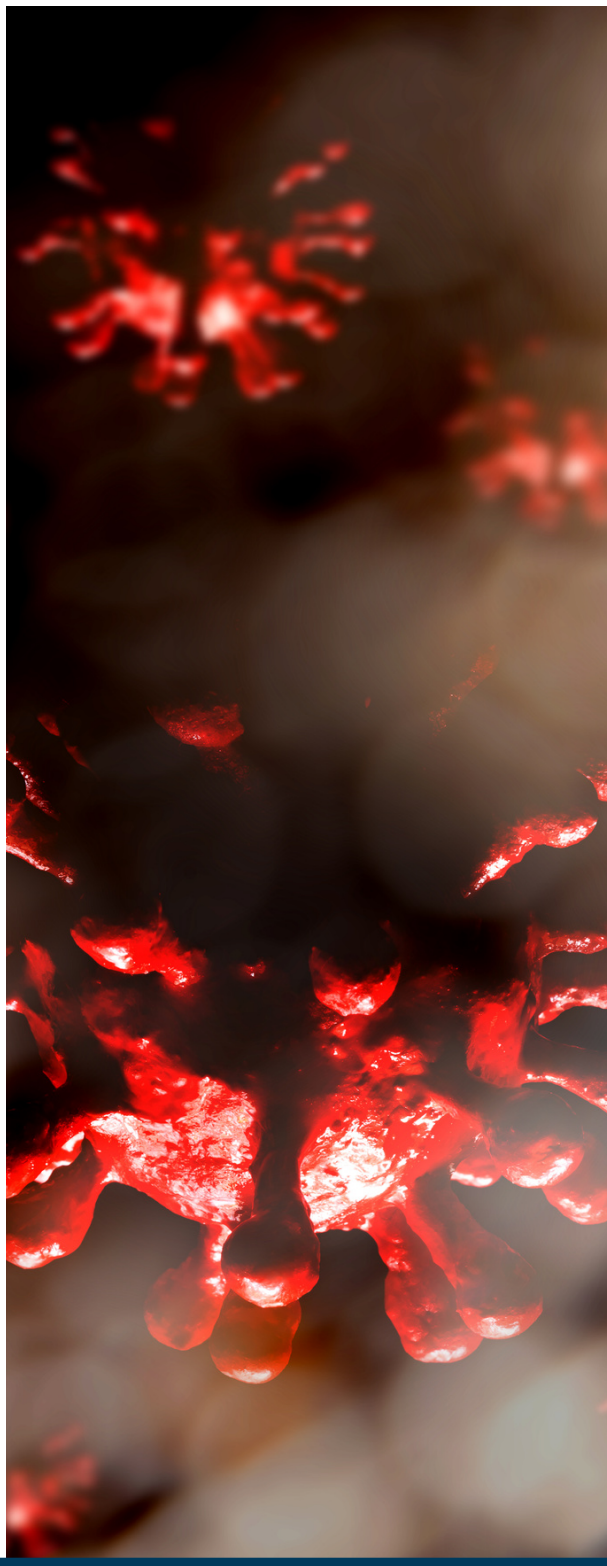
Can COVID-19 be transmitted through my HVAC system?

To date, there is no conclusive scientific proof that the COVID-19 virus has been transmitted through a ducted HVAC system. However, recently there has been increasing evidence that the virus can remain airborne for a period of hours or longer under some conditions.

It is presumed that some particles may stay airborne long enough to enter an HVAC air distribution system. However, experts believe that the risk of transmission this way is small.

The HVAC mitigation tactics described in this guide can help to reduce the possibility of your HVAC system becoming contaminated with the COVID-19 virus. However, none of these tactics are 100% guaranteed to prevent transmission of the virus. Some of them have significant drawbacks, and there are costs that must be weighed along with the benefits.

It's also important to realize that these tactics must be part of a more comprehensive plan that includes preventing the primary means of COVID-19 transmission: person-to-person contact and contact with contaminated surfaces.



HIGH EFFICIENCY HVAC FILTERS

What HVAC filters do: protect your HVAC system & improve air quality

Standard HVAC filters are intended to capture dust and other larger airborne particles and keep them out of your HVAC equipment. This keeps the system clean and running efficiently, and can also help to reduce dust in your space.

Higher efficiency HVAC filters are made with denser material that can capture smaller particles, such as pollen, pet dander, mold spores, and some bacteria and viruses. These filters are commonly used to improve indoor air quality and may reduce allergy and asthma symptoms.

What they don't do: eliminate COVID particles

It's not surprising that people are thinking about high efficiency HVAC filters as a way to prevent the spread of COVID. The idea seems to make sense: if tiny virus particles may be making their way into your HVAC air distribution, why not use denser filters to capture them and prevent their spread throughout your space?

The most dense and efficient filters on the market, commonly referred to as HEPA filters, can capture up to 99.97% of particles associated with COVID. Other filters can't effectively capture COVID particles.

However, there are potential downsides to using HEPA filters: high efficiency filters can be thicker than standard ones, and may not fit within your system's filter housing.

High efficiency filters may also require more horsepower to pull air through the filter. If you add a high efficiency filter without adding a more powerful fan, the internal pressure drop across the filter may strain the system. Decreased airflow means your system can't cool as well. It will need to run longer to reach set temperature. That uses more electricity, increases wear on parts, and can lead to breakdowns.

Choosing the right HVAC filter efficiency

The standard measurement of filter efficiency is the MERV system, which stands for Minimum Efficiency Reporting Value. Filters with a higher MERV rating can capture smaller particles, and more of them. Standard HVAC air filters are rated at MERV 8. HEPA filters are rated between MERV 17 and MERV 20.

For those looking to increase filter efficiency and improve indoor air quality, MERV 13 filters are recommended by the CDC and ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) and can offer some benefit. While they can't fully eliminate virus particles, they can capture 50% of particles in the size range of COVID particles.

Choosing the right HVAC filter for you depends on many factors including your equipment, the usage of your space, your location, and your air quality concerns. Arista can work with you to determine the best option for your unique situation.

Demand for MERV 13 filters is very high right now. We are currently experiencing 6 to 8 week lead times and it's likely to get worse before it gets better.

How much do high efficiency HVAC filters cost?

Standard size MERV 13 HVAC filters cost about $20 each: that's 3 times the price of standard MERV 8 filters. They also can get clogged faster, so you may need to change them more frequently, which adds to the cost.

UV LIGHT TECHNOLOGY FOR HVAC SURFACE CLEANING & DISINFECTION

Ultraviolet (UV) light—specifically UVC light, also known as germicidal UV—has been used for decades in hospitals and other settings to kill pathogens (including mold, bacteria, and viruses) on surfaces and in water. In fact, UVC light was one tactic used in New York City to disinfect subway trains during the worst of the COVID outbreak.

UVC radiation destroys cells within minutes of exposure by damaging the DNA and RNA. It also damages human skin cells, which is why these devices are used only when spaces are empty. (And you should be wary of devices that use UV light to disinfect hands.)

When installed within an HVAC system, UV lamps destroy contaminants (including coronavirus particles) that can accumulate on the surface of air conditioning cooling coils. UV light does a great job of killing mold and mildew that can build up on evaporator coils over time. That's important because the buildup makes it harder for the system to transfer heat and cool your space.

When your AC coils are clean, the system runs less, uses less electricity, and there's less wear and tear on the parts that can cause breakdowns. Plus, contaminants on surfaces are destroyed before they can be dislodged and make their way into the air in your space and potentially cause lingering odors and illness.

What it doesn't do: kill airborne virus particles

UV light is considered a "passive" technology since it can only destroy particles within its "line of sight." UV light is NOT effective at killing airborne virus particles that may make their way into your HVAC ducts and travel through the system. That's because it takes a certain period of time for UV light to destroy particles.

Airborne particles are moving quickly through your HVAC air distribution system, and don't remain in contact with the UV light long enough to destroy them, unless the proper quantity of UV lights are installed (which can be cost prohibitive and possibly not practical).

Why choose UV light technology?

- Improve overall indoor air quality within your space
- Reduce the frequency (and cost) of manual AC coil cleaning
- Improve HVAC efficiency and effectiveness

ADVANCED OXIDATION & IONIZATION TECHNOLOGY FOR AIR PURIFICATION

What oxidation & ionization devices do: kill contaminants in the air

Advanced oxidation and ionization technologies can accomplish what filters and UV lights alone can't do. Devices with "active" technology can not only destroy airborne particles moving through your HVAC system, they can also go a step further to effectively clean all the air in your space. They are commonly used in healthcare facilities and food processing plants, and can significantly increase indoor air quality in other commercial, residential, and public sector spaces.

There are a number of different types of technology you may have heard about, including **photocatalytic oxidation (PCO) and bipolar or plasma ionization**, that work in different ways to target and destroy airborne particles. They are very effective at removing viruses, bacteria, mold spores, VOCs, and even odors from the air, and doing so very quickly. In fact, the devices can reduce sneeze germs by 99% in the time a sneeze can reach three feet.

Here's the great news: the most popular device we offer was recently proven by third-party testers to be **99.9% effective at inactivating the COVID-19 virus** within a simulated real-world space.

Here's how they work in simple terms. The technology takes oxygen molecules from the air and converts them into charged atoms that then cluster around micro particles, surrounding and deactivating harmful substances like airborne mold, bacteria, allergens, and viruses. The larger particles result in more efficient filtering of the air. The process also produces friendly oxidizers found in nature that get distributed throughout your space, not only within your HVAC system.

They have also been proven effective at reducing harmful VOCs and odors.

Watch this video to see a demonstration of how they work in an office setting.

Air purifiers that use these technologies are commonly installed into the supply plenum (often between the structural ceiling and a drop ceiling) of your existing air conditioning or heating system air ducts. We are recommending devices that combine these technologies, along with using UVC light, to offer the most effective and comprehensive protection from airborne contaminants in your space.

What they don't do: offer a foolproof guarantee against COVID

Keep in mind that even the best technology is not guaranteed to prevent COVID-19 transmission.

Why choose oxidation & ionization technology?

- Offer the best possible protection to occupants of your space against airborne transmission of COVID
- Reduce contaminants that trigger allergy and asthma symptoms
- Has been shown to kill as much as 99% of viruses, bacteria, and mold spores (including COVID-19)
- Fight odors
- Get protection that works silently and unobtrusively throughout your entire space

How much do oxidation & ionization devices cost?

Prices vary depending on a number of variables. Systems can range from approximately $500 per unit installed to $1,800 per unit installed.

HVAC HUMIDIFICATION

What humidification does: create poor conditions for viruses

Recent research has shown that increasing indoor humidity (to moderate levels) can help to deactivate the virus (as well as bacteria and other microbes) and reduce the number of viable airborne particles.

During the winter months when our spaces are closed up and heated, relative humidity (RH) levels tend to drop to extremely low levels (between 20 and 40 percent). Unfortunately, those are the ideal conditions for the COVID-19 virus to thrive and remain viable for longer periods.

According to the research, adding moisture to the air may damage the outer membrane of the virus, and also make “droplets” less likely to linger in the air. Relative Humidity (RH) levels between 40% and 60% are believed to be effective in reducing viral transmission and infection in general. Increased humidity has the added benefit of moisturizing our mucous membranes, which increases your body’s ability to fight the virus.

Adding central humidification to your HVAC system can boost humidity to safe, moderate levels throughout the heating season. A central humidifier adds moisture (water vapor) to the air circulating throughout your space via your HVAC system.

Unlike portable humidifiers, the central humidifier system can improve air quality conditions throughout your entire home or commercial space. Plus, central humidifiers monitor humidity conditions so you don't end up with too much humidity in the air, which can encourage mold growth and result in odors and damage to furniture and finishes in your space (especially woodwork and fine art).

What it doesn't do: actively destroy virus particles

Unlike UV lights or oxidation and ionization devices, humidification doesn't actively kill virus particles. It just creates conditions that discourage them from thriving and staying airborne.

Why choose a central HVAC humidifier?

- Discourage the spread of viruses and bacteria
- Get consistently comfortable humidity levels within your entire space
- Eliminate dry skin, flyaway hair, itchy eyes, and irritated sinuses and throats caused by dry indoor air

VENTILATION DESIGN

What does ventilation do?

Many experts, including the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), are recommending increased ventilation to dilute and displace contaminants (including coronavirus particles) in indoor air.

What exactly is ventilation? It's the "V" in HVAC, and it simply means bringing more outside air inside. Here in New York City, that's not always easily done if you can't just open a window.

However, there are HVAC solutions that can add more outside air to your space. Possibilities include ductwork design changes, exhaust fans, and make up air units. You can also add controls that allow you to increase ventilation 2 hours before occupants enter the space, and reduce it 2 hours after occupants leave the space.

Because buildings and their usage vary so much, adding ventilation requires a consultation with an HVAC design expert to recommend the right strategy.

What it doesn't do: actively kill viruses

Adding ventilation is similar to humidification in the sense that it creates conditions where viruses don't thrive. But it does not kill particles on surfaces or in the air.

Why choose to increase ventilation?

- Improve overall indoor air quality in your space
- "Flush out" areas where COVID particles may be present in the air
- Improve worker productivity in commercial spaces
- Help to reduce condensation on surfaces
- Create more comfortable conditions in crowded spaces
- Reduce "sick building" symptoms such as headaches, allergies, asthma, rashes and sinusitis

Caution: When increasing ventilation in winter, it's important to heat the cold outside air you bring into the space to avoid freezing pipes within the building.

THE COSTS OF ADDING COVID-PREVENTION TECHNOLOGY

When it comes to predicting the cost of adding UV lighting, oxidation and ionization air purifiers, central humidification, and ventilation to your HVAC system, there are a great many variables that need to be taken into account. These include the amount of space you have, number of system components, the type and design of your current heating and air conditioning systems, the usage of your space, and the technology options you want to implement.

These variables make the cost ranges so large that they aren't helpful. The best way to find out which options fit your budget is to talk with an Arista expert. We can inspect your system and review all the options and associated costs, and help you decide what's best for your specific needs.

REMINDER: DON'T OVERLOOK THE BASICS WHEN IT COMES TO COVID MITIGATION

HVAC mitigation can help to prevent transmission via small airborne droplets or via contaminated surfaces; however, experts say that these are not the most common way that the disease spreads. Remember that COVID is transmitted primarily by in person, face to face contact.

Even if you implement every tactic and technology mentioned here, don't make the mistake of believing that they can allow you to relax the most important COVID prevention strategies, such as social distancing, face coverings, and hand washing.

CLICK HERE TO REQUEST A CONSULTATION

ABOUT ARISTA

Whether you're responsible for the installation of a new HVAC system or inherited legacy equipment, Arista has the experience to service and maintain any system throughout its lifecycle.

Across the New York City metro area, we're recognized as one of the region's most respected and referred HVAC experts. When you purchase HVAC equipment, repair service, or a preventive maintenance service agreement from Arista, you're backed by an industry leader that has earned its reputation through decades of trustworthy business conduct and quality service.

Peace of mind at a fair price

Your account is managed by a senior Arista technician and backed by an expert staff of over 160 highly trained professionals. Arista boasts a comprehensive program of continuous staff training and professional development on state-of-the-art practices and processes.

Arista clients also enjoy these benefits:

- Quick-to-respond, accessible workforce and a fleet of 100+ vehicles
- 24/7 emergency standby service
- 30,000 sq. ft. corporate warehouse facility stocked with over 55,000 parts
- One of a few select NY state companies to earn both the prestigious MSCA STAR and GreenStar designations
- LEED Accredited Professionals to assist in making smarter, more energy-efficient HVAC choices

SAFETY PROTOCOLS WE FOLLOW

SCREENING EMPLOYEES. Arista screens employees' health before assigning work and promotes quarantining when determined necessary. Arista technicians are very conscientious about protecting the health and safety of our clients, as well as their co-workers.

WEARING MASKS. Arista provides masks to every technician to protect both our clients' spaces and the well-being of our team.

WEARING PROTECTIVE GLASSES. Glasses are provided to every Arista technician to both protect our clients space and the well-being of our team.

WEARING GLOVES. Wearing disposable gloves (and changing them between jobs) is an important tactic to reduce contact with the virus on surfaces. After completing each job, Arista technicians are taught to remove their gloves, dispose of them safely, and then wash their hands as per CDC guidelines.

WEARING BOOTIES. Every Arista technician is equipped with booties to prevent bringing dirt and debris into our clients' spaces.

DISINFECTING AREAS IN CONTACT WITH OUR PERSONNEL. After working in your space, Arista technicians clean all surfaces they come into contact with, such as HVAC access and controls, with disinfectant.

SAFELY DISPOSING OF FILTERS. Arista technicians place used filters (which might contain virus particles) in plastic bags and throw them away in your outside trash receptacles.

Questions? Call Arista Today.

We hope you've found this guide to be a useful reference. We invite you to call us for a quote on your equipment purchase, installation, or service needs. We think you'll agree that hearing what we have to say will be one of the best decisions you make in researching your HVAC needs. Reach an Arista HVAC specialist today at 718-937-4001 or email info@aristair.com.