

# Filtration and HVAC Upgrades to Mitigate Infection Transmission



*How Dynamic Air Cleaners can help*

**The Science of Clean Air™**

There are many paths to transmission of COVID-19. We've seen much focus on using social distancing to limit airborne transmission by expelled droplet nuclei between people in close proximity. That is an important measure. However, droplet nuclei quickly get smaller and may also stay airborne long enough to be entrained into the HVAC system. To prevent it from becoming a means of distribution, MERV 13+ filtration is being recommended by ASHRAE, as well as other measures, such as UVC. Dynamic has a range of systems that can help in the fight against COVID-19.

## **The Dynamic V8 Air Cleaning System**

The Dynamic V8 provides MERV 15 performance, with lower pressure drop and a far longer service life than passive alternatives. In the normal course, the Dynamic V8 has many advantages over passive filters. It is widely used as both a retrofit and in new construction in critical applications such as laboratories, healthcare, military installations, and art museums. In the current situation, the Dynamic V8 has several specific advantages:

**Low pressure drop allows for retrofit into a wider range of systems:** The higher static pressure inherent in high-efficiency passive filtration upgrades make them difficult or impossible in many instances. The Dynamic V8, with its low static pressure, no pre-filter, and flexibility of design allow it to be used in many situations where passive filters cannot be used. Dynamic V8s can be permanently mounted in AHUs for upstream or downstream access; in slide-out racks for package equipment; or duct-mounted in VRF applications. With a clean static pressure of typically less than .3" w.g., there a lot of options.

**Longest Maintenance Cycle:** In actual installations, Dynamic V8s without pre-filters will last 2-5 years between changeouts. Again, in the normal course, this means less energy, less landfill, and less labor. In the current crisis, maintenance staffs are stretched thin and changing filters is not only time-consuming, it is also dangerous.

**Positive Seal:** The seal of any filter is critically important to its effectiveness in the field. A small gap can allow an astonishing amount of unfiltered air to get around the filter. The Dynamic V8 has a positive seal throughout its construction to eliminate bypass. The media pads seal inside the frames; the frames seal to the assembly; and the assembly seals in the rack.

**A Deeper Cleaning of the Air:** The MERV test is a useful tool for comparing filtration options. However, it is not the whole story:

Firstly, it does not take into consideration particles below 0.3 micron. Secondly, it does not consider changes in particle size distribution.

Like all Dynamic polarized-media air cleaners, the Dynamic V8 uses an active, non-ionizing, DC voltage to create an electrostatic field that polarizes both the media fibers and the particles in the air. This gives Dynamic Air Cleaners the ability to agglomerate and collect ultrafine particles. For example, in an in-situ test in an urban environment, a Dynamic V8 Air Cleaning System in a commercial building yielded indoor levels of ultrafine particles (0.015-0.1 micron) that were 92 to 99% lower than outdoor levels.

### **UVC Systems Designed for Airstream Capture and Inactivation**

UVC has been used for decades to inactivate molds, bacteria, and viruses in air and water. Most UVC in HVAC applications is optimized to inactivate biologicals that might be on the surfaces of coils and in drain pans. Dynamic Sterile Sweep® UVC Systems couple high output 254nm UVC lamps with translucent glass media in Dynamic Air Cleaners, in a “Catch, Hold, Kill” configuration optimized for airborne inactivation. This provides the necessary contact time for UVC to work. 90% of captured bacillus subtilus is inactivated after 5 minutes, and 99% after 20 minutes. These systems were part of the Anthrax clean-up at the U.S. Postal Service and continue to be the basis of design in many Federal mailroom applications. More commonly, the Sterile Sweep and 1” or 2” V-Banks are used as a frequent pre-filter for Dynamic V8s in hospital applications.

### **Fan Powered Systems**

Dynamic combines the ideal combination of air cleaning in modular, self-contained units to provide necessary filtration and/or air change rates. These systems can be tailored to meet specific needs in a variety of applications.

### **1” and 2” Glass Panel Applications**

Despite the flexibility of the Dynamic V8, there will be applications where the only option is to put something into a 1” or 2” filter track. Examples here would be small rooftops, fan coils in apartments, offices and hotels. Dynamic Air Cleaners provide far superior filtration to the typical offering in these units. While we would not compare single-pass efficiency of 1” or 2” panel air cleaners to MERV 13 filtration (and make no mistake single-pass efficiency is very important in pathogen capture), the overall effect on particle levels in the space over time can be similar or superior. Furthermore, there is the ability and a synergy to couple the 1” or 2” panel air cleaners with UVC for capture and kill of pathogens.

Dynamic Air Quality Solutions  
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