



Facility Safety

4 Things You Need to Know Before Buying a Commercial Air Purifier

James Langford | May 26, 2022

Poor indoor air quality was biting into factories' bottom lines long before 2020. The global pandemic that began that year made airborne contaminants a public health priority virtually overnight, however, driving commercial air purifier sales through the roof and showing many buyers how little they knew about what they were purchasing.

As building owners snapped up air purifiers so that factories, schools and offices could reopen more safely, they found themselves grappling with complaints that their purchases were inadequate for the job, had features such as ionizers that came with unintended side effects and sometimes, both.

The fact that the U.S Occupational Safety and Health Administration, which regulates worker and workplace safety, has no specific regulation governing purifiers even though it considers ensuring healthy air quality part of employers' responsibility, only complicated matters.

"There's a lot of snake oil out there," says Seth Wyatt, director of sales at Filtration Group's indoor air quality business. "There's unproven technology that doesn't really have much testing from independent laboratories or third parties, in terms of validation."

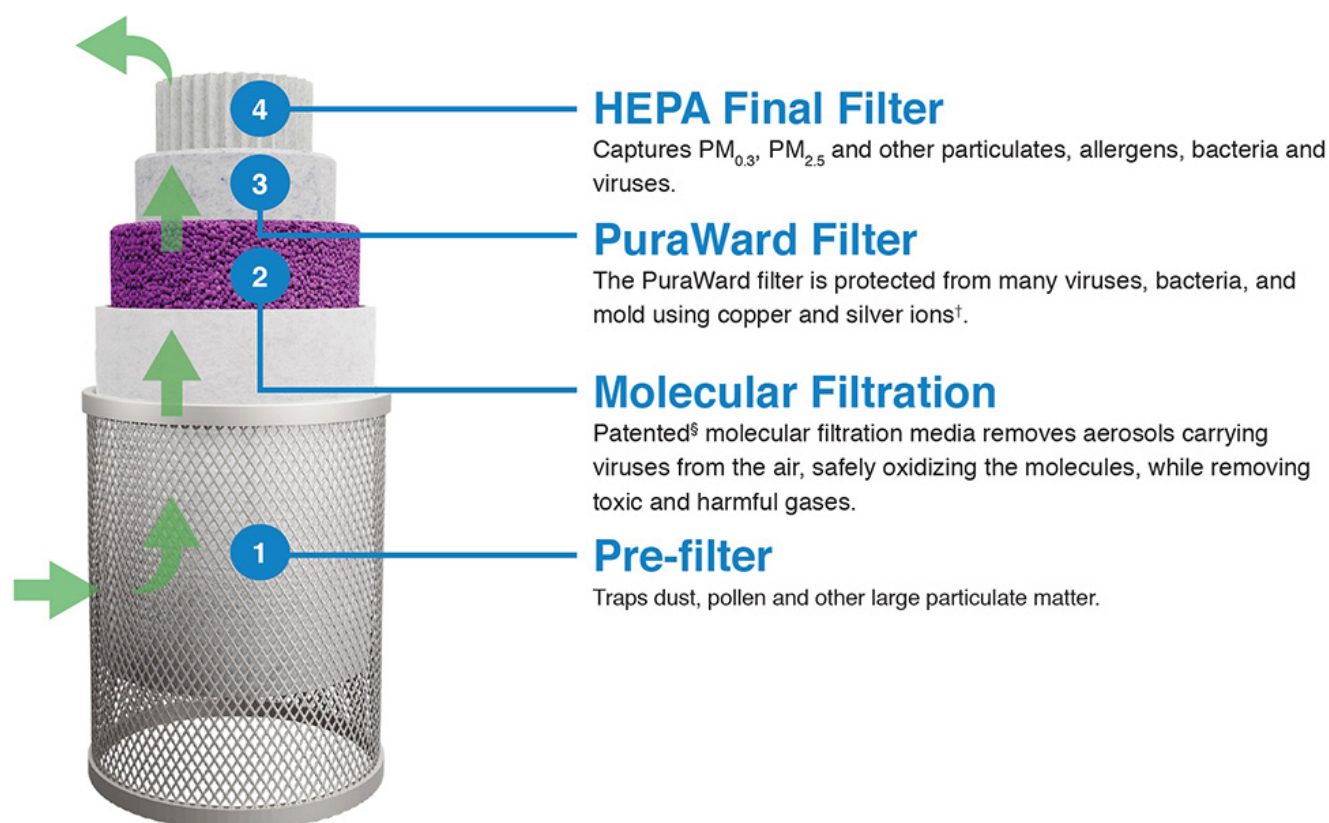
Buyers of portable air purifiers should research their options thoroughly, Wyatt said, focusing on the volume of air that a unit can move, the volume of the room where it will be used and the number of people entering and leaving it.

"We spend 90 percent of our time indoors, between our homes, our workplaces, and our cars, and indoor air quality is generally quite questionable."

Seth Wyatt
Filtration Group IAQ

Rather than electronic air cleaners, such as ionizers that inject charged particles into the air in an attempt to neutralize toxins or pollutants, buyers should look for products built around subtractive technology that simply removes contaminants, he adds. Technologies are available that have many years of real-world use.

High Efficiency Particulate Air, or HEPA filters, which Filtration Group uses in its purifiers, are one example of that. The molecular filtration media that the firm includes, which enable gas phase filtration, is another.



Courtesy of Filtration Group

"It's an instant and irreversible process that occurs when certain contaminants come into contact with the surface of the media as the air flows across it," Wyatt says. "Our media turns those contaminants into harmless salts that are then permanently attached to the surface of the media."

Along with viruses, indoor air hazards frequently include emissions from fuel-burning combustion appliances such as gas ovens and wood stoves, tobacco products, newly installed flooring or carpet, deteriorating asbestos insulation, excess moisture and outdoor pesticides, according to the U.S. Environmental Protection Agency.

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Most heating, ventilation and air conditioning (HVAC) systems are designed largely to heat and cool while filtering out only large contaminants such as hair that may reduce the system's efficiency.

"That's something else to consider with a lot of the buildings we operate in," Wyatt says.

Following are some of the key points that building operators and owners should keep in mind as they determine whether they need air purifiers and, if so, what kind.

Why Does My Business Need an Air Purifier?

While federal workplace regulations don't include indoor air quality standards, OSHA does have rules governing both ventilation and some contaminants known to cause respiratory problems, according to its website. Further, the "general duty" clause of the law that created the agency requires employers to

provide a safe working environment free of hazards that are likely to cause severe injury or death.

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Purifiers can help employers meet those standards while simultaneously reducing the frequency of lost workdays that lower productivity. Poorly ventilated buildings are susceptible to sick building syndrome, a phenomenon in which contaminants invisible to the naked eye cause recurring illnesses and infections, costing U.S. businesses about \$200 billion a year, according to Filtration Group.

How Do Air Purifiers Work?

Air purifiers using subtractive technology work by pulling air in, scrubbing it and pushing it back out to the surrounding area. Filtration Group's PuraShield 500, for instance, uses a 360-degree intake to pull in air, which is then funneled through a pre-filter, past molecular filtration media for permanent contaminant removal and through a HEPA filter with 99.7 percent efficiency. The HEPA filter houses antimicrobial media, which have copper and silver woven into the fabric that latch onto and neutralize contaminants.



PuraShield 500 | Courtesy of Purafil, a Filtration Group company

Tracking Efficiency With Clean Air Delivery Rate

To remove viruses from the air, a cleaner must be able to handle particles as small as 0.1 to 1 micron, a measurement unit equal to one-millionth of a meter, according to the EPA. Manufacturers use a variety of indicators to measure a purifier's strength, from its efficiency at handling specific particle sizes, to measurement systems such as Clean Air Delivery Rate, or CADR. To identify models that can remove viruses, the EPA says, look for a CADR that specifies smoke removal, as opposed to pollen, for example, or a HEPA designation. Testing results can provide valuable information, too. Filtration Group's Purafil business, for example, has measured the effectiveness of its PuraShield products on aerosolized viruses at the Aerosol Research and Engineering Labs Inc. "For those who are seeking solutions for very specific challenges like that, it's really important to understand how the product is going to perform."



Keep an Eye on Air Changes Per Hour

Choosing an optimal air purifier generally requires weighing a unit's air flow, measured in cubic feet per minute or CFM, against the volume of the room where it will be used. A purifier handling 250 cubic feet per minute installed in a 1,000-square-foot room with 8-foot ceilings would generate about two air changes per hour, or ACH – basically cleaning the air every 30 minutes, Wyatt says. That's a minimum for such a room, he says, and the appropriate ACH might be as high as six, depending on how many people use the space and how often. Six air changes per hour in a room with 8-foot ceilings and 1,000 square feet would require processing about 800 CFM, necessitating three PuraShield 500 purifiers. The PuraShield Smart 1000, which cleans 1,100 cubic feet per minute, would deliver 8 changes per hour in the same space. "We like to focus on vulnerable critical environments," Wyatt adds. "Depending on the type of location, those would be high-traffic spaces like restrooms, breakrooms, maybe the lobby, cubicle farm or the vice president of sales' or human resources offices where people are in and out frequently." The extremely large volumes of air in a wide-open space like a manufacturing floor make a portable purifier less viable, but units can make a difference in cells on that floor where four or five people work in close proximity.

What contaminants does your business rely on commercial air purifiers to remove? Tell us in the comments below.

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