



Safety

Air Filtration: What Are MERV Ratings and How Do They Protect Your Workers?

Roland Jones | Jan 26, 2021

Do you have enough air filtration in your facility? It's a question that's worth asking as organizations come back online amid the ongoing COVID-19 pandemic. Good air filtration involves understanding the basics of MERV ratings. Here's what you need to know.

While good indoor air quality is vital inside buildings to provide workers with clean air and to safeguard any sensitive equipment, it's especially important as organizations seek to keep workers safe from the coronavirus and other airborne hazards.

It's generally understood that particles that contain COVID-19 may remain in the air long enough to be a hazard to workers, and so there's a strong need to filter the air that moves through HVAC systems and into spaces where people are working.

"Look for a filter with a similar pressure drop to the filter you have, or make sure your system can accommodate the upgrade."

American Society of Heating, Refrigeration and Air-Conditioning Engineers

Your facility's air filtration system is therefore a crucial component in protecting workers from the COVID-19 virus. Filtration systems can block out airborne hazards such as viruses, dust, pollen, mold and bacteria.

The *American Society of Heating, Refrigeration and Air-Conditioning Engineers* (ASHRAE) has designed the Minimum Efficiency Reporting Value (MERV) scale to measure the effectiveness of filters when it comes to capturing the microscopic airborne particles that could make people sick.

Read more: Fogged-Up Glasses: 5 Ways to Keep Eye Protection from Fogging While Wearing a Mask

The Centers for Disease Control and Prevention (CDC) and ASHRAE **recommend using an air filter with a minimum rating of MERV 13 whenever possible**, while a rating of MERV 14 is preferred. In-room units are recommended for facilities that can't upgrade their HVAC filters, or increasing the circulation of outdoor air during winter. These units should include high MERV or better filters to remove most of these virus-laden particles.

Late last year, the Occupational Safety and Health Administration (OSHA) ***published guidance on ventilation best practices in the workplace*** to combat the spread of coronavirus. Those guidelines include redirecting personal fans away from blowing air from one worker to another, using HVAC system filters with a MERV rating of 13 or higher, where feasible, increasing the HVAC system's outdoor air intake, and opening windows or other sources of fresh air where possible.

Here are some of the most important things to know about MERV ratings and improving indoor air quality:

Which Air Filter MERV Rating Do I Need?

To ensure the best air quality in your facility, it's critical to understand MERV ratings. MERV stands for Minimum Efficiency Reporting Values and runs on a scale from 1 to 20, where the higher the number, the denser the filter and the more effective it is at removing the smallest particulates in the air. Here are five MERV filter bands and what you can expect from them.

MERV Ratings

1 MERV standards 1 to 4

Typical applications:

- Minimum filtration
- Residential buildings

Average particulate arrestance:

60% to 80%

Contaminants typically captured:

Larger particles greater than 10 microns, including pollens, dust mites and textile fibers.



2 MERV standards 5 to 8

Typical applications:

- Residential buildings with higher air filtration needs
- Most commercial buildings

Average particulate arrestance:

80% to 95%

Contaminants typically captured:

Particles between 3 and 10 microns, including mold spores or cement dust.



3 MERV standards 9 to 12

Typical applications:

- Residential buildings with the highest air filtration needs
- Commercial buildings requiring above-average filtration

Average particulate arrestance:

> 90% to 98%

Contaminants typically captured:

Particles between 1 and 3 microns, such as Legionella bacteria, lead dust, coal dust or auto emissions.



4 MERV standards 13 to 16

Typical applications:

- Hospital inpatient and general surgery
- Commercial buildings with the highest air filtration needs

Average particulate arrestance:

> 96% to 99%

Contaminants typically captured:

Particles between 0.3 and 1 micron, including all bacteria, most smoke, and droplet nuclei.



5 MERV standards 17 to 20

Typical applications:

- Cleanrooms
- Pharmaceutical manufacturing

Average particulate arrestance:

> 99.97%

Contaminants typically captured:

Particles less than 0.3 micron, such as viruses, radon progeny or carbon dust.



SOURCES: National Air Filtration Association, U.S. Environmental Protection Agency, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Occupational Safety and Health Administration, Johns Hopkins Bloomberg School of Public Health

Read more: [How to Prepare for Possible Viral Outbreaks Within Your Workforce](#)

Best Practices for Replacing Filters

When it comes to servicing filters, OSHA recommends following ***guidelines from ASHRAE***, which include wearing N95 respirators, eye protection (safety glasses, goggles or face shields, for example), and disposable gloves. Bag the filter immediately before disposal and wash your hands after completing the work, ASHRAE also suggests.

If you are trying to replace your filter with a higher MERV filter, be sure it will fit and seal in your system, ASHRAE says: "Look for a filter with a similar pressure drop to the filter you have, or make sure your system can accommodate the upgrade."

Organizations should also consider filtration efficacy, HVAC performance and worker comfort. It's important to make sure in advance that your current HVAC system can handle the higher MERV rated filter, because although the highest MERV ratings may remove the most particles from the air, they may also cause your HVAC system to become inefficient, leading to poor climate control and higher energy costs.

Tips to Improve Indoor Air Quality

Here's a collection of our best articles on air quality and safety:

[What Manufacturers Need to Know About Indoor Air Quality Management](#)

[The Invisible Danger: How to Protect Against Indoor Air Pollutants](#)

[Tips and Tools for Indoor Air Quality and Efficiency in Building Envelopes](#)

[Using Fluke Air Particle Counters in Healthcare Facilities](#)

[Summer Safety: Beat Workplace Heat Stress with Cool Air, Ventilation and HVLS Fans](#)

How are you making sure there's enough ventilation and air filtering in your facility to keep workers safe? What approaches have you found most successful? Share your thoughts in the comments below.