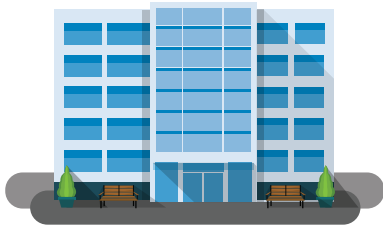


# The Importance of Indoor Air Quality



## Protecting Your Environment from Airborne Contaminants

The air we breathe at home, work, and school may contain a variety of contaminants, such as bacteria, pollen, and viruses. The U.S. Environmental Protection Agency (EPA) identified indoor air quality (IAQ) as one of the top five most urgent environmental risks to public health.

An extensive body of scientific evidence demonstrates that short- and long-term exposure to fine particle pollution negatively affects the cardiovascular system. Poor IAQ are commonly associated with improperly operated and maintained heating, ventilating, and air conditioning (HVAC) systems.

## Filter Efficiency & MERV Ratings

Minimum efficiency reporting values, or MERV, define the ability of an air filter to capture particles from large to small. The higher the MERV rating, the better able it is to remove small particles from an airstream.

## Filter Change Frequency and IAQ

As dust collects on an air filter, that filter's usable life decreases. The recommended replacement timeframe is every 90 days, but air filters should be replaced more frequently in households that battle allergies, asthma, and pet dander. Further, homes that experience higher than average foot traffic require even more filter changes, as often as every 30 to 60 days, to maintain ideal IAQ.

MERV Rating	Particle Size Efficiency .3 - 1.0 microns	Particle Size Efficiency 1.0 - 3.0 microns	Particle Size Efficiency 3.0 - 10.0 microns
MERV 1-4	—	—	Less than 20%
MERV 6	—	—	35% - 49.9%
MERV 8	—	—	70% - 84.9%
MERV 10	—	50% - 64.9%	≥85%
MERV 11	—	65% - 79.9%	≥85%
MERV 12	—	80% - 89.9%	>90%
MERV 13	Less than 75%	≥90%	≥90%
MERV 14	75% - 84.9%	≥90%	≥90%
MERV 16	≥95%	≥95%	≥95%

Standards as defined by ASHRAE 52.2

## Indoor Air Quality

The world's leading health-related organizations consider 10 microns, 2.5 microns, and 1 micron fine-dust fractions as the most important and dangerous for humans.

### Airborne particulate sizes and how far they can travel into the body

#### 10 micron

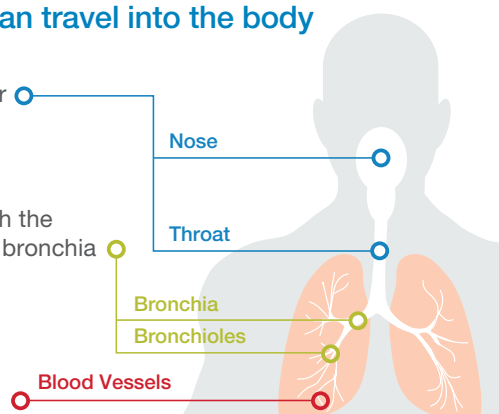
are small enough to enter the **nose and throat**

#### 2.5 micron

are small enough to reach the **lungs** and deposit in the bronchia

#### 1 micron or smaller

are small enough to find their way through the lungs into **blood vessels**



\*Efficiency on particles smaller than 0.3 micron is not defined by ISO 16890.

**MERV 13** The EPA recommends that consumers who are concerned about small particles choose furnace filters with at least a MERV 13 rating or as high a MERV rating as the system fan and filter track can accommodate.

Source: EPA July 2018

### Striking a Balance Between Particle and Energy Efficiency

People who want to upgrade their air filtration without sacrificing too heavily on energy efficiency can find a middle ground. While not quite as effective as a MERV 13 filter at removing small particles, MERV 10 or 11 filters represent a step up from a more basic air filter while also requiring less energy to force air into filtered spaces and reducing strain on HVAC equipment.

Air filters with higher performance ratings have smaller pores than filters with lower performance ratings. These pores create the resistance to air flow. If a filter is used in an HVAC system that is not designed to handle this resistance, it can lower the system's efficiency, decrease indoor air quality, and put strain on the system's fan.

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