What Is MERV Rating? Air Filter Rating Chart

As air moves through a building's HVAC system, air filters trap and collect large and small particles such as dust, allergens and microorganisms. According to the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), this filtration helps provide healthier indoor air quality.
A filter's MERV number indicates how it's rated to remove these particles. But what is MERV rating, exactly?
An air filter's minimum efficiency reporting value (MERV) rating measures how effectively the filter stops dust and other contaminants from passing through the filter and into the air stream. Filters with higher MERV ratings trap small particles more effectively than filters with lower MERV ratings.
In general, filters with a rating of MERV 16 or below are considered to be HVAC-system-grade filters for residential, commercial and general hospital use. MERV 17 through MERV 20 filters are typically used in surgical operating rooms, clean rooms and other contexts that require absolute cleanliness.

MERV Filter Ratings and Efficiency

When selecting the right filter for your application, higher is not always better. Using an air filter with a MERV rating higher than what your furnace or air conditioner manufacturer recommends can actually impair its performance.
The smaller pores in more highly rated air filters create resistance to air flow, and if the 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.

MERV Filter Ratings and Air Quality

A position paper published by ASHRAE looked at the claim that particle filtration has health benefits. According to this paper, there's a well established connection between higher concentrations of particles in outdoor air and poor health outcomes, so it would make sense that filtering these particles out of indoor air could lead to better health outcomes.
The ASHRAE paper reviewed studies suggesting that:
-Particle filtration can be "modestly effective" against allergy and asthma symptoms.
-Particle filtration can lower the concentration of infectious airborne particles that spread many communicable illnesses, which is why some models suggest that it can "substantially decrease the portion of disease transmission caused by these small particles."

-The health benefits of particle filtration are proportional to "the reduction in total exposure to particles less than 2.5 µm in diameter."

Use the MERV rating chart below to understand which filters are best for which applications.

	APPLICATION	CONTROLS THESE CONTAMINANTS	PARTICLE SIZE
MERV 1 **MERV 2** **MERV 3** **MERV 4**	· Pre-Filter In Commercial Building · Residential Furnaces · Window Air-Conditioning Units	· Pollen · Dust mites · Sanding dust · Textile/carpet fibers	Filters down to 10.0 micron particle size
MERV 5 **MERV 6** **MERV 7** **MERV 8**	· Pre-filters or Final Filters · Commercial Buildings · Better Residential Buildings · Industrial Workplaces · Paint Booth Inlets	· Pollen · Dust mites · Sanding dust · Textile/carpet fibers · Mold/spores · Dust lint · Cement dust	Filters down to 3.0–10.0 micron particle size
MERV 9 **MERV 10** **MERV 11** **MERV 12**	· Pre-Filters or Final Filters · Hospital Laboratories · Better Commercial Buildings · Superior Residential Buildings	· Pollen · Dust mites · Sanding dust · Textile/carpet fibers · Mold/spores · Dust lint · Cement dust · Legionella · Lead dust · Humidifier dust · Coal dust · Nebulizer dust	Filters down to 1.0–3.0 micron particle size

MERV 13 MERV 14 MERV 15 MERV 16	· Final Filters · General Surgery · Superior Commercial Buildings · Hospital Inpatient Care · Smoking Lounges	· Pollen · Dust mites · Sanding dust · Textile/carpet fibers · Mold/spores · Dust lint · Cement dust · Legionella · Lead dust · Humidifier dust · Coal dust · Nebulizer dust · Bacteria · Tobacco smoke · Auto fumes · Sneeze nuclei · Insecticide dust · Copier toner · Pet dander · Face powder	Filters down to 0.3–1.0 micron particle size

MERV 17 **MERV 18** **MERV 19** **MERV 20**	· Final Filter · Clean Rooms · Radioactive Materials · Pharmaceutical Manufacturing Facilities · Carcinogenic Materials · Orthopedic Surgery Room	· Pollen · Dust mites · Sanding dust · Textile/carpet fibers · Mold/spores · Dust lint · Cement dust · Legionella · Lead dust · Humidifier dust · Coal dust · Nebulizer dust · Bacteria · Tobacco smoke · Auto fumes · Sneeze nuclei · Insecticide dust · Copier toner · Pet dander · Face powder · Virus carriers · Carbon dust · Sea salt · Combustion smoke · Radon progeny · Odor · Microscopic allergens	Filters down to less than 0.30 micron particle size

Pre-Filters vs. Final Filters

Air filters can be used as final filters or pre-filters. When used as final filters, they are the primary filters for an HVAC system.
Final filters may be used alone in a single-filter system, or they may be used in combination with one or more pre-filters.
When used in a multi-filter system, the pre-filters trap the dirt and large particles

before the air reaches the final filters downstream, which then remove the smaller particles.
This multi-filter system extends the life of the more expensive final filters, leading to overall cost savings.