

ASHRAE 52.1 vs. ASHRAE 52.2

Air filters are commonly described and rated based upon their collection efficiency, pressure drop (or airflow resistance), and particulate-holding capacity. Two filter test methods are currently used in the United States: American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 52.1-1992 ASHRAE Standard 52.2-2012

Standard 52.1-1992 measures arrestance, dust spot efficiency, and dust holding capacity. Arrestance means a filter's ability to capture a mass fraction of coarse test dust and is suited for describing low and medium-efficiency filters. Be aware that arrestance values may be high, even for low-efficiency filters, and do not adequately indicate the effectiveness of certain filters for chemical or biological protection. Dust spot efficiency measures a filter's ability to remove large particles, those that tend to soil building interiors. Dust holding capacity is a measure of the total amount of dust a filter is able to hold during a dust-loading test.

ASHRAE Standard 52.2-2012 measures particle size efficiency (PSE). This newer standard is a more descriptive test, which quantifies filtration efficiency in different particle size ranges for a clean and incrementally loaded filter to provide a composite efficiency value. It gives a better determination of a filter's effectiveness to capture solid particulate as opposed to liquid aerosols. The 1999 standard rates particle-size efficiency results as a MERV between 1 and 16. A higher MERV indicates a more efficient filter. In addition, Standard 52.2 provides a table (see below) showing minimum PSE in three size ranges for each of the MERV numbers, 1 through 16.

MERV	ASHRAE 52.2			ASHRAE 52.1		Particle size range, um	Applications
	Particle size range			Test			
	3 to 10 um	1 to 3 um	.3 to 1 um	Arrestance	Dust spot		
1	<20%	-	-	<65%	<20%	>10	Residential - Larger than 10.0 microns. Light Pollen, Spanish moss, dust mites, sanding dust, paint spray, dust, textile fibers, carpet fibers
2	<20%	-	-	65-70%	<20%		
3	<20%	-	-	70-75%	<20%		
4	<20%	-	-	>75%	<20%		
5	20-35%	-	-	80-85%	<20%	3.0-10	Commercial buildings, better residential, industrial workplace, paint booth inlets. 3.0 to 10 microns. Mold, spores, hair spray, cement dust, snuff, powdered milk
6	35-50%	-	-	>90%	<20%		
7	50-70%	-	-	>90%	20-25%		
8	>70%	-	-	>95%	25-30%		
9	>85%	<50%	-	>95%	40-45%	1.0-3.0	Superior residential, better commercial buildings, hospital laboratories. 1.0 to 3.0 microns. Legionella, lead dust, milled flour, coal dust, auto emissions, nebulizer drops, welding fumes
10	>85%	50-65%	-	>95%	50-55%		
11	>85%	65-80%	-	>98%	60-65%		
12	>90%	>80%	-	>98%	70-75%		
13	>90%	>90%	<75%	>98%	80-90%	0.3-1.0	Hospital inpatient care, general surgery, smoking lounges, superior commercial buildings. 0.30 to 1.0 micron. All bacteria, most tobacco smoke, droplet nuclei, cooking oil, copier toner, face powder, paint pigment
14	>90%	>90%	75-85%	>98%	90-95%		
15	>90%	>90%	85-95%	>98%	~95%		
16	>95%	>95%	>95%	>98%	>95%		