
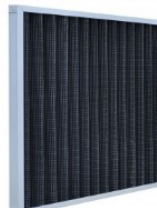

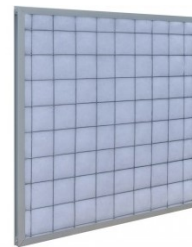










ASHRAE Standard 52.2				ASHRAE Standard 52.1	Application Guidelines			Application Guidelines				
MERV	Particle Size Removal Efficiency, Percent in Particle Size Range, μm			Dust-Spot Efficiency Percent	Particle Size and Typical Controlled Contaminant	Typical Applications	Typical Air Filter/Cleaner Type					
	0.3 to 1	1 to 3	3 to 10									
1			< 20	< 20	> 10 μm Pollen	Minimum filtration Residential window air conditioners	Throwaway – Fiberglass or synthetic media panel, 1 inch thick. Washable – Aluminum mesh, foam rubber panel Electrostatic – Self-charging (passive) woven polycarbonate panel	Primary Filters				
2			< 20	< 20	Cockroach body parts and droppings							
3			< 20	< 20	Spanish moss							
4			< 20	< 20	Sanding dust Spray paint dust Textile fibers Carpet fibers							
5			20-35	< 20	3-10 μm Mold	Better residential Commercial buildings Industrial workplaces	Pleated filters –Extended surface with cotton or polyester media or both, 1 to 6 inches thick. Cartridge filters –Viscous cube or pocket filters Throwaway –Synthetic media panel filters					
6**			35-50	< 20	Spores Dust mite body parts and droppings							
7			50-70	25-30	Cat and dog dander							
8			> 70	30-35	Hair spray Fabric protector Dusting aids Pudding mix Powdered milk							
9		< 50	> 85	40-45	1-3 μm Legionella	Superior residential Better commercial buildings Hospital laboratories	Pleated filters –Extended surface with cotton or polyester media or both, 1 to 6 inches thick. Box Filters – Rigid style cartridge, 6 to 12 inches deep.	Medium				
10		50-65	> 85	50-55	Humidifier dust							
11		65-80	> 85	60-65	Lead dust Milled flour							
12		> 80	> 90	70-75	Auto emission particles Nebulizer drops							
13	< 75	> 90	> 90	80-90	0.3-1 μm All bacteria	Superior commercial buildings Hospital inpatient care General surgery	Bag Filters – Nonsupported (flexible) microfibre fiberglass or synthetic media, 12 to 36 inches deep. Box Filters – Rigid style cartridge, 6 to 12 inches deep.	Fine				
14	75-85	> 90	> 90	90-95	Droplet nuclei (sneeze)							
15	85-95	> 90	> 90	> 95	Cooking oil							
16	> 95	> 95	> 95		Most smoke Insecticide dust Most face powder Most paint pigments							
17	≥ 99.97	in 0.1 – 0.2 μm particle size			< 0.3 μm Virus (unattached)	Electronics manufacturing Pharmaceutical manufacturing Carcinogenic materials	HEPA/ULPA Filters*	Ultra Fine				
18	≥ 99.99				Carbon dust							
19	≥ 99.999	in 0.3 μm particle size			Sea salt							
20	≥ 99.999				All combustion smoke							

This table is adapted from ANSI/ASHRAE Standard 52.2-2007. 15

*The last four MERV values of 17 to 20 are not part of the official standard test, but have been added by ASHRAE for comparison purposes. Ultra Low Penetration Air filters (ULPA) have a minimum efficiency of 99.999 percent in removing 0.3 μm particles, based on the IEST test method. MERVs between 17 and 19 are rated for 0.3 μm particles, whereas a MERV of 20 is rated for 0.1 to 0.2 μm particles.

** For residential applications, the ANSI/ASHRAE Standard 62.2-200716 requires a filter with a designated minimum efficiency of MERV 6 or better.



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