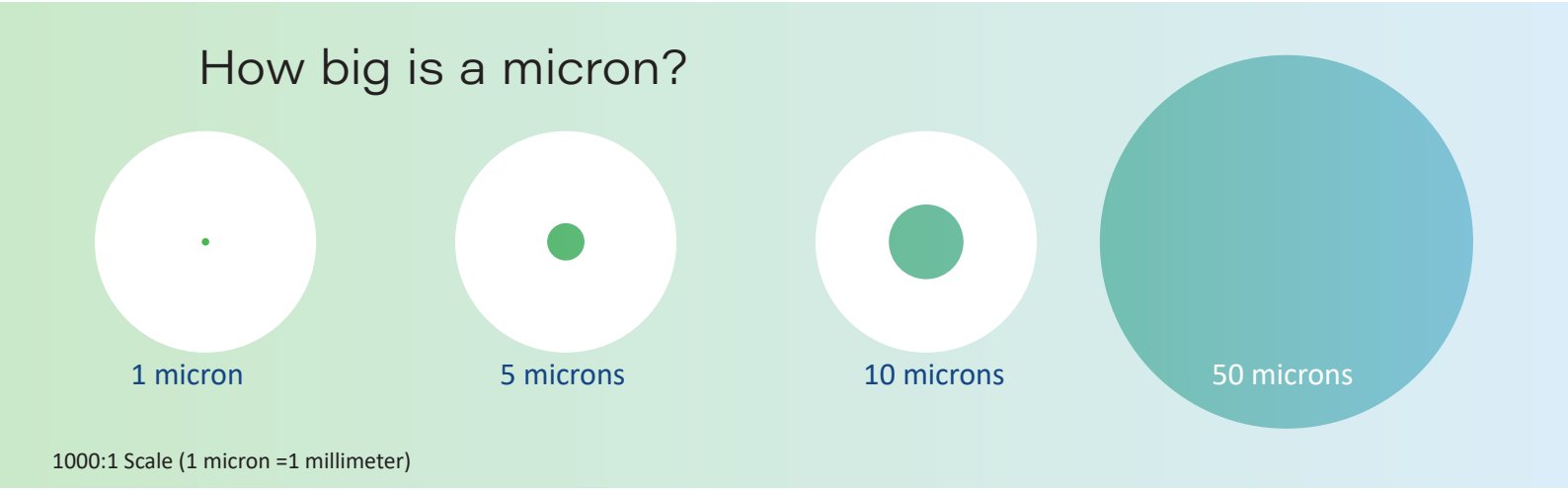
FILTRATION EFFICIENCY GUIDE

PARTICLES AND RELATIVE MICRON SIZE

Particles are generated or become airborne with everyday human, commercial and industrial activity. In the post-pandemic environment, this has become a significant issue to protect individuals and keep everyone safe when at home, work or in the greater community.

Airborne particles are generally measured in microns (millionths of a meter) and vary in size depending on the source. A strand of human hair, which is considered between 50 and 150 microns, is a good reference point when considering the relative size of large and small airborne particles.



1000:1 Scale (1 micron =1 millimeter)

Why be concerned about the size of the above particles?

Solid and liquid particles smaller than 10 microns can aggravate health conditions and cause respiratory problems in humans. A healthy human body can filter out particles as small as the 3-5 micron size via the respiratory system however it is exposure to smaller sub- micron particulate matter that can present health risks in humans.

Common Particles	Size
Human Hair	50-150 microns
Household dust and lint	0.01-100 microns
Pollen	10-110 microns
Mould	1-50 microns
Pet dander	0.1-10 microns
Tobacco Smoke or Soot	0.01-1 micron
Viruses and Bacteria	0.001-10 microns

FILTER RATING

A filter's efficiency rating describes the relationship between particles retained or trapped by the filter to the number of particles entering the filter.

For example if you are looking at the table below, it shows the rating and the efficiencies of each filter. If you look at H13 (Merv 17), it shows the filter is a 99.95% efficient filte. This indicates that 99.95% of particles entering the filter are removed from the air by the filter.

Filter Rating Guide

AS 1324.1 and AS4260 grade	Applications	Particle size range
G1	Residential, light pollen, dust mites	>10
G2		
G3	Industrial, dust moulds, spores	3.0- 10.0
G4		
F5		
F5	Industrial, legionell, dust	1.0 - 3.0
F6		
F7	Hospitals, smoke removal, bacteria	0.3 - 1.0
F8		
F8		
F9		
H13	Clean rooms, surgery, Viruses	<0.3
H14		
U15		
U16		

FILTER EFFICIENCY TABLE

Applications	Particle size range	AS 1324.1 and AS4 260 grade	EU equivalent Grade	MERV equivalent rate	ASHRAE 52.2			ASHHRAE 52.1	
					3 to 10 µm	2 to 3 µm	0.3 to 1 µm	Arrestance	Dust spot
Residential, light pollen, dust mites	>10	G1	EU1	1	<20%	-	-	<65%	<20%
		G2	EU2	2	<20%	-	-	65-70%	-
				3	<20%	-	-	70-75%	-
				4	<20%	-	-	>75%	-
Industrial, dust mould, spores	3.0- 10.0	G3	EU3	5	20-35%	-	-	80-85%	-
		G4		6	35-50%	-	-	90%	<20%
		F5	EU4	7	50-70%	-	-		20-25%
				8	>70%	-	-	>95%	25-30%
Industrial, legionell, dust	1.0 - 3.0	F5	EU5	9	>85%	<50%	-	>95%	40-45%
				10	>85%	50-65%	-	>95%	50-55%
		F6	EU6	11	>85%	65-80%	-	>98%	60-65%
				12	>90%	>80%	-	>98%	70-75%
Hospitals, smoke removal, bacteria	0.3 - 1.0	F7	EU7	13	>90%	>90%	<75%	>98%	80-90%
		F8	EU8	14	>90%	>90%	75-85%	>98%	90-95%
			EU9	15	>90%	>90%	85-95%	>98%	~95%
		F9	EU10	16	>95%	>95%	>95%	>98%	~95%
Clean rooms, surgery, Viruses	<0.3	H13	EU11	17	-	-	99.95%	-	-
		H14	-	18	-	-	99.995%	-	-
		U15	-	19	-	-	99.9995%	-	-
		U16	-	20	-	-	99.99995%	-	-

AES ENVIRONMENTAL