

Technical Standards

Table 1 : Comparison of general ventilation air filter test standards

Filter Performance									
MERV	ANSI / ASHRAE 52.2			ASHRAE 52.1		EN779 : 2002		EN1822 : 1998	
	Average Particle Size Efficiency (@ μm), %			Average Arrestance, %	Average Dust-Spot Efficiency, %	Class	Average 0.4 μm Particle Size Efficiency, %	Class	MPPS
	E1	E2	E3						Efficiency, %
	0.3-1.0	1.0-3.0	3.0-10.0						
1	-	-	<20	<65	<20	G1	-	-	-
2	-	-	<20	65-70	<20	G2	-	-	-
3	-	-	<20	70-75	<20	G2	-	-	-
4	-	-	<20	75-80	<20	G2	-	-	-
5	-	-	20-35	80-85	<20	G3	-	-	-
6	-	-	35-50	85-90	<20	G3	-	-	-
7	-	-	50-70	>90	25-30	G4	-	-	-
8	-	-	>70	>90	30-35	G4	-	-	-
9	-	<50	>85	>90	40-45	G4	-	-	-
10	-	50-65	>85	>95	50-55	F5	40-60	-	-
11	-	65-80	>85	>95	60-65	F6	60-80	-	-
12	-	>80	>90	>95	70-75	F6	60-80	-	-
13	<75	>90	>90	>98	80-90	F7	80-90	-	-
14	75-85	>90	>90	>98	90-95	F8	90-95	-	-
15	85-95	>90	>90	-	>95	F9	>95	-	-
16	>95	>95	>95	-	-	-	-	H10	85
N/A				-	-	-	-	H11	95
N/A				-	-	-	-	H12	99.5
N/A				-	-	-	-	H13	99.95
N/A				-	-	-	-	H14	99.995
N/A				-	-	-	-	U15	99.9995
N/A				-	-	-	-	U16	99.99995
N/A				-	-	-	-	U17	99.999995

Table 2 : Federal Standard 209 Class Limits.

Class	Particles / ft ³				
	≥ 0.1 μm	≥ 0.2 μm	≥ 0.3 μm	≥ 0.5 μm	≥ 5.0 μm
1	35	7.5	3	1	N/A
10	350	75	30	10	N/A
100	N/A	750	300	100	N/A
1,000	N/A	N/A	N/A	1,000	7
10,000	N/A	N/A	N/A	10,000	70
100,000	N/A	N/A	N/A	100,000	700

Table 3 : Airborne Classification in the EU - CGMP (1998)

Grade	Maximum permitted number of particles / m ³			
	at rest (b)		in operation (b)	
	0.5 μm (d)	5 μm	0.5 μm (d)	5.0 μm
A ©	3500	1 [e]	3500	1 [e]
B ©	3500	1 [e]	350000	2000
C ©	350000	2000	3500000	20000
D ©	3500000	20000	not defined (f)	not defined (f)

Table 4 : Selected ISO 14644-1 Airborn Particulate Cleanliness Classes for Cleanrooms and Clean Zones

ISO Classification Number	Maximum concentration limits (particles / m ³ of air) for particles equal to and larger than the considered sized shown below					
	≥ 0.1 μm	≥ 0.2 μm	≥ 0.3 μm	≥ 0.5 μm	≥ 1.0 μm	≥ 5.0 μm
ISO Class 1	10	2				
ISO Class 2	100	24	10	4		
ISO Class 3	1,000	237	102	35	8	
ISO Class 4	10,000	2,370	1,020	352	83	
ISO Class 5	100,000	23,700	10,200	3,520	832	29
ISO Class 6	1,000,000	237,000	102,000	35,200	8,320	293
ISO Class 7				352,000	83,200	2,930
ISO Class 8				3,520,000	832,000	29,300
ISO Class 9				35,200,000	8,320,000	293,000