EN 1822:2009 Classification of EPA, HEPA and ULPA Filters

Filter Group Filter Class	Integral Value		Local Value	
	Efficiency (%)	Penetration (%)	Efficiency (%)	Penetration (%)
E 10	≥ 85	≤ 15	---	---
E 11	≥ 95	≤ 5	---	---
E 12	≥ 99.5	≤ 0.5	---	---
H 13	≥ 99.95	≤ 0.05	≥ 99.75	≤ 0.25
H 14	≥ 99.995	≤ 0.005	≥ 99.975	≤ 0.025
U 15	≥ 99.9995	≤ 0.0005	≥ 99.9975	≤ 0.0025
U 16	≥ 99.99995	≤ 0.00005	≥ 99.99975	≤ 0.00025
U 17	≥ 99.999995	≤ 0.000005	≥ 99.9999	≤ 0.0001

ISO 14644-1 Classification of Air Cleanliness by Particle Concentration

ISO Class Number (N)	Maximum allowable concentrations (particles/m³) for particles equal to and greater than the considered sizes, shown below[a]					
	0.1 µm	0.2 µm	0.3 µm	0.5 µm	1 µm	5 µm
1	10[b]	d	d	d	d	e
2	100	24[b]	10[b]	d	d	e
3	1,000	237	102	35[b]	d	e
4	10,000	2,370	1,020	352	83[b]	e
5	100,000	23,700	10,200	3,520	832	d, e, f
6	1,000,000	237,000	102,000	35,200	8,320	293
7	c	c	c	352,000	83,200	2,930
8	c	c	c	3,520,000	832,000	29,300
9[g]	c	c	c	35,200,000	8,320,000	293,000

[a] All concentrations in the table are cumulative, e.g. for ISO Class 5, the 10,200 particles shown at 0.3 µm include all particles equal to and greater than this size.

[b] These concentrations will lead to large air sample volumes for classification. Sequential sampling procedure may be applied.

[c] Concentration limits are not applicable in this region of the table due to very high particle concentration.

[d] Sampling and statistical limitations for particles in low concentrations make classification inappropriate.

[e] Sample collection limitations for both particles in low concentrations and sizes greater than 1 µm make classification at this particle size inappropriate, due to potential particle losses in the sampling system.

[f] In order to specify this particle size in association with ISO Class 5, the macroparticle descriptor M may be adapted and used in conjunction with at least one other particle size.

[g] This class is only applicable for the in-operation state.

Comparison of International Classification Standards

Number of part 0.5 µm/m³ (approx.)	U.S. Federal Standard		EN ISO 14644-1 1996
	209E-1992	209D-1988	
-	-	-	ISO 1
1	-	-	-
4	-	-	ISO 2
10	M 1	-	-
35	M 1.5	1	ISO 3
100	M 2	-	-
353	M 2.5	10	ISO 4
1,000	M 3	-	-
3,530	M 3.5	100	ISO 5
10,000	M 4	-	-
35,300	M 4.5	1,000	ISO 6
100,000	M 5	-	-
353,000	M 5.5	10,000	ISO 7
1,000,000	M 6	-	-
3,530,000	M 6.5	100,000	ISO 8
10,000,000	M 7	-	-
35,000,000	-	-	ISO 9

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