

ISO 14644-1 Cleanroom Standards

Cleanroom Standards for Classification

For those companies that need to adhere to specific cleanroom design standards, they must understand that cleanrooms can be built and operated to meet different cleanliness classifications, depending on the environmental conditions required for their use. The primary authority for clean room classifications is the International Organization for Standardization or ISO.

Class	Maximum Particles / m ³						FED STD 209E Equivalent
	≥0.1 μm	≥0.2 μm	≥0.3 μm	≥0.5 μm	≥1 μm	≥5 μm	
ISO 1	10	2.37	1.02	0.35	0.083	0.0029	
ISO 2	100	23.7	10.2	3.5	0.83	0.029	
ISO 3	1,000	237	102	35	8.3	0.29	Class 1 Cleanroom
ISO 4	10,000	2,370	1,020	352	83	2.9	Class 10 Cleanroom
ISO 5	100,000	23,700	10,200	3,520	832	29	Class 100 Cleanroom
ISO 6	1.0×10 ⁶	237,000	102,000	35,200	8,320	293	Class 1,000 Cleanroom
ISO 7	1.0×10 ⁷	2.37×10 ⁶	1,020,000	352,000	83,200	2,930	Class 10,000 Cleanroom
ISO 8	1.0×10 ⁸	2.37×10 ⁷	1.02×10 ⁷	3,520,000	832,000	29,300	Class 100,000 Cleanroom
ISO 9	1.0×10 ⁹	2.37×10 ⁸	1.02×10 ⁸	35,200,000	8,320,000	293,000	Room Air

(μm denotes micron particle size)

ISO 14644-1 classifies a cleanroom based on the size and number of airborne particles per cubic meter of air (see chart above).

Prior to the implementation of ISO 14644-1, US Federal Standard 209E set the industry guidelines for cleanroom classification, and denoted the number of particles 0.5μm or larger per cubic foot of air. For instance, under FED-STD-209E, a “class 1000 cleanroom” would indicate 1,000 particles 0.5 μm or smaller in each cubic foot of air. FED-STD-209E was officially cancelled on November 29th, 2001, though both standards are still widely used.