

CLEAN SPACE

A defined area in which particle concentration and environmental conditions are controlled at or below specified limits (ASHRAE 2011 Handbook).

CLEANLINESS CLASSIFICATION (CLASS)

Allowable particle concentrations per cubic meter over a range of particle sizes as outlined in ISO standard 14644-1 (see chart below). For example, an ISO Class 5 cleanroom is defined as a space where the particle concentration does not exceed 100,000 particles per cubic meter for 0.1µm particles, or 832 particles per cubic meter for 1µm particles.

CLEANROOM

An enclosed area especially constructed for environmentally controlling airborne particulates, temperature, humidity, air pressure, airflow patterns, air motion, vibration, noise, viable organisms, and lighting (ASHRAE 2011 Handbook).

FIRST AIR

Air supplied directly from the HEPA filter before it passes over any work location (ASHRAE 2011 Applications Handbook).

HIGH-EFFICIENCY FILTER (HEPA)

A filter with an efficiency in excess of 99.97% of 0.3 micrometer, (ASHRAE 2011 Applications Handbook).

MAKEUP AIR

Air introduced to the secondary (recirculated) air system for ventilation, pressurization and replacement of exhaust air.

PARTICLE CONCENTRATION

The number of individual particles per unit volume of air (ASHRAE 2011 Applications Handbook).

PARTICLE SIZE

The apparent maximum linear dimension of a particle in the plane of observation (ASHRAE 2011 Handbook).

SECONDARY AIR

Air that recirculates through the workspace (ASHRAE 2011 Applications Handbook).

ULTRALOW-PENETRATION AIR FILTER (ULPA)

A filter with a minimum efficiency of 99.999 percent of 0.12 micrometer particles, (ASHRAE 2011 Applications Handbook).

UNIDIRECTIONAL FLOW

Formerly called laminar flow. Air flowing at constant and uniform velocity in the same direction (ASHRAE 2011 Handbook).

WORKSTATION

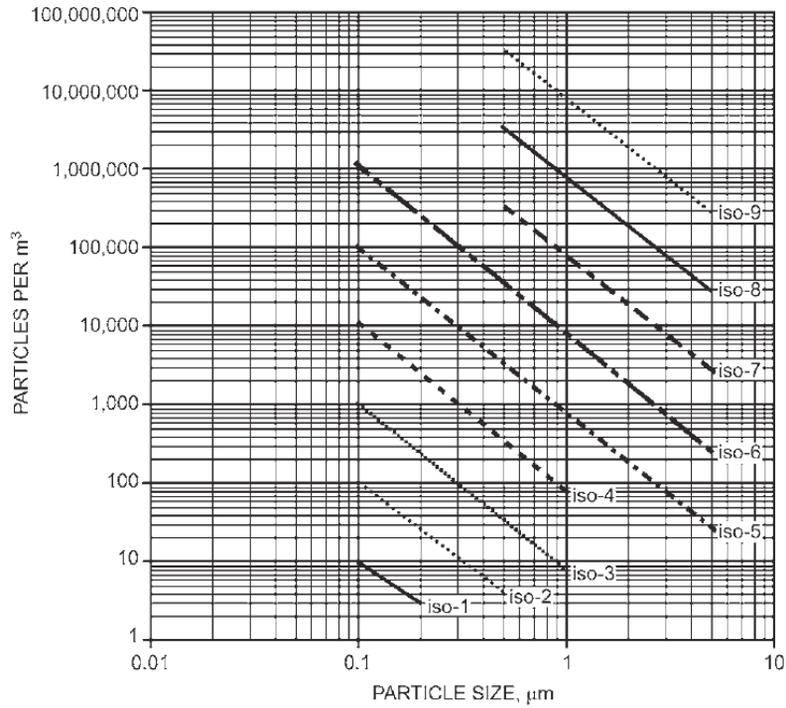
An open or enclosed work surface with direct air supply (ASHRAE 2011 Handbook).

Air Cleanliness Class Limits U.S. Federal Standard 209

Airborne Particle Concentration Limits from ISO Standard 14644-1						
ISO 14644 Class	0.1 µm	0.2 µm	0.3 µm	0.5 µm	1.0 µm	5.0 µm
Particles per m ³						
1	10	2				
2	100	24	10	4		
3	1000	237	102	35	8	
4	10,000	2370	1020	352	83	
5	100,000	23,700	10,000	3520	832	29
6	1,000,000	237,000	102,000	35,200	8320	293
7				352,000	83,200	2930
8				3,520,000	832,000	29,300
9				35,200,000	8,320,000	293,000

Note: Values shown are the concentration limits for particles equal to and larger than the sizes shown.
 $C_n = 10^N(0.1/D)^{2.08}$ where C_n = concentration limits in particles/m³, N = ISO class, and D = particle diameter in µm

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Air Cleanliness Classifications ISO Standard 14644-1