

6. Framework of standards

The concentration of airborne particles in cleanrooms is kept below a specified limit through the use of ingenious ventilation technology. These limits are defined in the ISO 14644 series of standards.

ISO 14644-1:1999 was the first and fundamental standard of this series. It was originally based on US Federal Standard 209 E issued in 1988, and has been continuously revised and supplemented since its initial publication. Technical committee ISO 209, "Cleanrooms and associated controlled environments", is responsible for the standardisation.

Even today, the "old" classifications in accordance with US Federal Standard 209 are still quoted regularly. This standard was the definitive guide for almost two decades. It was characterised by its clear presentation of particle concentrations using the reference size of 0.5 μm .

In 2001, US Federal Standard 209 was withdrawn in order to make way for the new ISO 14644-1.

ISO 14644-1 standard in comparison with US Federal Standard 209 E

ISO classification number (N)	Maximum value for particle concentration (particles per cubic metre of air)						US Federal Standard 209 E
	0.1 μm	0.2 μm	0.3 μm	0.5 μm	1 μm	5 μm	
ISO class 1	10	2		–	–	–	–
ISO class 2	100	24	10	4	–	–	–
ISO class 3	1,000	237	102	35	8	–	1
ISO class 4	10,000	2,370	1,020	352	83	–	10
ISO class 5	10,0000	23,700	10,200	3,520	832	29	100
ISO class 6	100,0000	237,000	102,000	35,200	8,320	293	1,000
ISO class 7	–	–	–	352,000	83,200	2,930	10,000
ISO class 8	–	–	–	35,20,000	832,000	29,300	100,000
ISO class 9	–	–	–	35,200,000	8,320,000	293,000	–