



ISO 14644-1 FED STD 209E DESIGN GUIDE FOR CLEANROOMS

Cleanliness Classification	Airflow Pattern	Average Air Velocity	Air Changes Per Hour
ISO Class 8 (100,000)	Nonunidirectional/Mixed	1-8 fpm	5-30
ISO Class 7 (10,000)	Nonunidirectional/Mixed	10-15 fpm	30-70
ISO Class 6 (1,000)	Nonunidirectional/Mixed	25-40 fpm	125-240
ISO Class 5 (100)	Unidirectional	40-80 fpm	240-480
ISO Class 4 (10)	Unidirectional	50-90 fpm	300-540
ISO Class 3 (1)	Unidirectional	60-90 fpm	360-540
ISO Class 2	Unidirectional	60-100 fpm	360-600

NOTES	
1	This table relates to cleanliness class to both the average air velocity in the cleanroom and rate of air changes per hour. The range of values listed is a consensus of existing practice and is not intended to indicate design. It is up to the designer and end user to arrive at a value either inside or outside the range that is consistent with project needs. Generally the approach is to the higher values in cleanrooms housing a relatively dirty process or where the cleanroom garment program or discipline is relaxed. The lower end of the range is more appropriate for cleaner processes and a more disciplined cleanroom gowning procedure.
2	Ideal differential pressurization range: ("w.g.") 0.02-0.08

Cleanliness Class	Filter Efficiency	Ceiling Grid Type	Air Return Design	Filtered Ceiling Coverage
2	99.99999% @ 0.12µm	Gel Grid	Raised Floor	100% Ceiling Coverage
3	99.9995% @ 0.12µm	Gel Grid	Raised Floor	100% Ceiling Coverage
4	99.999% @ 0.12µm	Gel Grid	Raised Floor	100% Ceiling Coverage
5	99.99% @ 0.30µm	1-1/2" T Bar Gasket	Low Wall	50-100% Ceiling Coverage
6	99.99% @ 0.30µm	1-1/2" T Bar Gasket	Low Wall	20-60% Ceiling Coverage
7	99.99% @ 0.30µm	1-1/2" T Bar Gasket	Low Wall	5-40% Ceiling Coverage
8	99.99% 0.30µm	T Bar Grid	Low Wall or Ceiling	5% Ceiling Coverage