Typical Cleanroom Design Considerations

Note - These comments and numbers should be considered as guidelines. Each cleanroom should be designed to meet the requirements of the process.

Cleanroom Classification

ISO 14644-1	Controlled Area	8	7	6	5
FED-STD-209E	Controlled Area	100,000	10,000	1,000	100
Final Filtration	95% Ashrae	99.99% HEPA	99.99% HEPA	99.99% HEPA	99.99% HEPA
Cleanroom Certification	Not Req'd	Req'd	Req'd	Req'd	Req'd
Airflow Type	Non-unidirectional	Non-unidirectional	Non-unidirectional	Non-unidirectional	Unidirectional
Air Changes per hour	5 to 20	5 to 30	20 to 90	90 to 150	150 to 400+
Average Room Velocity	1 to 5 fpm	1 to 5 fpm	5 to 12 fpm	12 to 45 fpm	45 to 90 fpm
Temperature	68 to 72 degrees F	68 to 72 degrees F	68 to 72 degrees F	66 to 70 degrees F	66 to 70 degrees F
Relative Humidity	30 to 55% RH	30 to 55% RH	30 to 55% RH	30 to 55% RH	30 to 55% RH
Gowning Room	Req'd	Req'd	Req'd	Req'd	Req'd
Material Transfer Area	Req'd	Req'd	Req'd	Req'd	Req'd
Janitor Closet	Req'd	Req'd	Req'd	Req'd	Req'd

1.0 Cleanroom classification is specified as the maximum allowable airborne particle concentrations in the OPERATIONAL mode.
2.0 Higher concentrations for particles less than 0.5 micron in size may be observed in Controlled Areas.
3.0 Temperature requirements reflect personel comfort levels basis gowning protocols. Fluctuations of +/- 2 degrees F are permitted.
4.0 Air changes per hour (ACPH) = (Avg. room velocity x 60) / (room height), Room CFM = (ACPH x Room volume) / 60