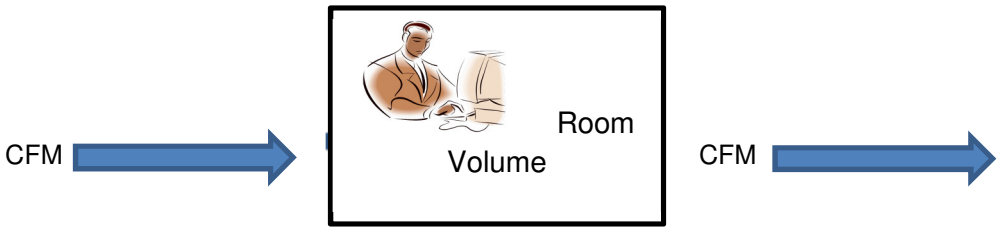
Air Change Rates



Air change rate per hour can be expressed as;

ACR = 60 x CFM / V (1)

Where;

ACR = air change rate per hour

CFM = air flow through the room (Cubic Feet per Minute)

V = volume of the room (Cubic Feet)

For example;

Room = 10 x10 x 8 = 800 cubic feet

Supply Grille = 10 x 8 x 6 with 6 inch flex duct attached delivering 80 cfm @ 0.1in. static pressure

ACR = 60 x 80 / 800

ACR = 4800 CFH (Cubic Feet per Hour) / 800

ACR = 6.0

Conclusion: The complete volume of air filling this room is completely changed 6 times in one hour when the ventilation equipment is delivering its air to the room for that length of time. However, to be also considered is that the comfort system delivering the air does not always run for the whole hour straight. So to factor in the change rate, one must consider the demand for ventilation requirements based on building construction, heat load requirements, and buildings environmental characteristics. Such as shade, direction of exposure, glass, radiant, convection, and conduction heat loads. The more efficient the building construction, the lower the demand to heat or cool, thus reducing the air changes per hour unless the blower is set to run all the time in the "on" position as is normal in commercial settings.

The tables on the following pages show common Air Change Rates for buildings / rooms;

Building / Room	Air Change Rates *- ACR - (1/hr)*	Building / Room	Air Change Rates *- ACR - (1/hr)*
All spaces in general	min 4	Court Houses	4 - 10
Attic spaces for cooling	12 - 15	Dental Centers	8 - 12
Auditoriums	8 - 15	Department Stores	6 - 10
Bakeries	20	Dining Halls	12 -15
Banks	4 - 10	Dining rooms (restaurants)	12
Barber Shops	6 - 10	Dress Shops	6 - 10
Bars	20 - 30	Drug Shops	6 - 10
Beauty Shops	6 - 10	Engine rooms	4 - 6
Boiler rooms	15 - 20	Factory buildings, ordinary	2 - 4
Bowling Alleys	10 - 15	Factory buildings, fumes and moisture	10 - 15
Cafeterias	12 - 15	Fire Stations	4 - 10
Churches	8 - 15	Foundries	15 - 20
Club rooms	12	Galvanizing plants	20 - 30
Clubhouses	20 - 30	Garages repair	20 - 30
Cocktail Lounges	20 - 30	Garages storage	4 - 6
Computer Rooms	15 - 20	Homes, night cooling	10 - 18
Laundries	10 - 15	Jewelry shops	6 - 10
Libraries, public	4	Kitchens	15 - 60

Lunch Rooms	12 -15	Restaurants	8 - 12
Luncheonettes	12 -15	Retail	6 - 10
Nightclubs	20 - 30	School Classrooms	4 - 12
Malls	6 - 10	Shoe Shops	6 - 10
Medical Centers	8 - 12	Shopping Centers	6 - 10
Medical Clinics	8 - 12	Shops, machine	5
Medical Offices	8 - 12	Shops, paint	15 - 20
Mills, paper	15 - 20	Shops, woodworking	5
Mills, textile general buildings	4	Substation, electric	5 - 10
Mills, textile dye houses	15 - 20	Supermarkets	4 - 10
Municipal Buildings	4 - 10	Town Halls	4 - 10
Museums	12 -15	Taverns	20 - 30
Offices, public	3	Theaters	8 - 15
Offices, private	4	Turbine rooms, electric	5 - 10
Police Stations	4 - 10	Warehouses	2
Post Offices	4 - 10	Waiting rooms, public	4
Precision Manufacturing	10 - 50	Pump rooms	5