

COOLING CHECK FIGURES AND DESIGN AIR DISTRIBUTION RATES

BUILDING TYPE	COOLING SQ. FT./TON	LIGHTS/EQUIP WATTS/SQ. FT.	PEOPLE SQ. FT./PERSON	AIR CHANGES VENTILATION ²⁾	ZONE PRIMARY AIR SCFM/SQ.FT.			
					E/S/W	NORTH	CORE	
Apartments	- Rental Suites - Hallways	450 550	1.0 2.0	600 -	.35 air changes not < 15cfm/person	1.0 -	0.6 -	- 0.7
Auditoriums/Assembly		250 or 20 seats/ton	2.0	15	15 cfm/person			1.6
Bakeries ³⁾		225	6.0 ¹⁾	80	20 cfm/person			1.8
Banks		230	4.0 ¹⁾	30	15 cfm/person			1.75
Barber Shops		250	3.5 ¹⁾	45	15 cfm/person			1.6
Bars/Taverns/Pubs		100	1.0	20	30 cfm/person			4.0
Bathrooms (public) ⁷⁾	- Blow Driers - Towel Dry	200 400	8.0 ¹⁾ 2.0	50 50	50 cfm/water closet 50 cfm/water closet	- -	- -	2.0 1.0
Beauty Shops		180	5.0 ¹⁾	45	25 cfm/person			2.2
Bowling Alleys		250 or 1.5 tons/alley	2.5	40	25 cfm/person			1.6
Clothing Shops (retail)		280	2.0	50	30 cfm/sq. ft.	1.6	1.4	1.2
Computer Rooms		80	6.0 ¹⁾	-	15 cfm/person			7.5
Department Stores	- Main Floors - Upper Floors	300 380	2.0 2.0	35 50	30 cfm/sq. ft. 20 cfm/sq. ft.	1.6 1.3	1.45 1.1	1.2 0.9
Doctor's Office	- Waiting Rooms - Examination Rooms	330 380	2.0 2.0	30 50	15 cfm/person 15 cfm/person			1.2 1.0
Drug Stores		250	3.0 ¹⁾	50	15 cfm/person			1.6
Educational	- Classrooms - Hallways	280 350	2.0 2.0	20 -	15 cfm/person 10 cfm/sq. ft.	1.6 -	1.3 -	1.2 1.2
Factories	- Light Manufacturing - Medium Manufacturing - Heavy Manufacturing	240 150 80	3.0 ¹⁾ 10.0 ¹⁾ 45.0 ¹⁾	100 200 300	15 cfm/person 15 cfm/person 15 cfm/person			1.7 2.7 5.0
Florists		250	3.0 ¹⁾	125	15 cfm/person			1.6
Gambling Casinos ⁴⁾		100	15.0 ¹⁾	25	30 cfm/person			4.0
Gift Shops		300	2.0	50	15 cfm/person			1.2
Grocery Stores		350	2.0	125	15 cfm/person	1.3		1.1
Hospital/Nursing	- Patient Rooms - Hallways - Exam/Procedure Rooms - Waiting Rooms	300 400 300 330	1.5 2.0 3.0 ¹⁾ 2.0 ¹⁾	100 - 50 30	25 cfm/person .05 cfm/sq. ft. 15 cfm/person 15 cfm/person	1.4 - -	1.2 - -	- 1.0 1.3 1.0
Hotel, Motel, Dorm	- Guest Rooms - Hallways - Lobby/Public	500 560 220	1.0 2.0 2.0	150 - 30	30/room .05 cfm/sq. ft. 15 cfm/person	1.0 -	0.7 -	- 0.7 1.7
Jewelry Stores		250	4.0	100	15 cfm/person			1.6
Kitchens		180	12.0 ¹⁾	100	15 cfm/person			2.2
Libraries and Museums		280	3.0 ¹⁾	80	15 cfm/person	1.7	1.3	1.2
Offices	- One-Story - Mid-Rise - High-Rise - Reception	350 400 450 350	3.0 ¹⁾ 3.0 ¹⁾ 3.0 ¹⁾ 2.0	150 150 150 50	20 cfm/person 20 cfm/person 20 cfm/person 15 cfm/person	1.5 1.3 1.2 -	1.2 1.0 1.0 -	1.0 0.8 0.8 1.15
Post Offices		280	2.0	30	15 cfm/person			1.4
Residences	- 15% Glass ⁵⁾ - 25% Glass ⁵⁾	700 ⁶⁾ 550 ⁶⁾	1.5 ¹⁾ 1.5 ¹⁾	400 400	.35 air changes not < 15cfm/person			0.6 0.75
Restaurants	- Kitchen - Fast Food Service, Dining - Formal Dining	180 150 250	12.0 ¹⁾ 3.25 ¹⁾ 3.25 ¹⁾	100 30 30	15 cfm/person 20 cfm/person 20 cfm/person			2.2 1.5 1.2
Shoe Stores		300	2.0	50	15 cfm/person			1.3
Smoking Lounges		100	1.0	20	60 cfm/person			4.0

NOTES:

These figures will help you assist your specifiers/designers to get a ballpark idea of the occupancy, lighting, ventilation, and cooling requirements of a building during the schematic phase of the project. All figures assume the outdoor ventilation rates shown.

These rules of thumb are not to be construed as the replacement for an accurate load estimate by the designer.

¹⁾ Where indicated, the lighting load includes other equipment such as driers, stoves, computers, etc.

²⁾ Ventilation rates are based on ASHRAE 62-1989

³⁾ Bakery figures assume that half of the floor space is dedicated to the kitchen and half to the seating/serving/display areas

⁴⁾ The figures for the casino include some area allocated for a modest restaurant and for public bathrooms

⁵⁾ The percent shown is the ratio of glass area to total outside wall area. A typical standard is 15%. Custom homes are 25%

⁶⁾ Do not count unexposed, below-grade areas. They have no cooling load

⁷⁾ Observe local building codes for exhaust. Figures shown assume the bathrooms are maintained at building design temperature

