

Ventilation Calculations

House	Length	Cubic ft. Width	Average Height	Cubic Ft.	Square ft.	design cfm	
Family room	14.50	14	12	2436	203	20	
Kitchen/Utility/Bath	21.00	12	12	3024	252	100	
Living room	13.50	19	12	3078	256.5		
Open area dining, living, kitchen					804	32	
Entry	14.00	8	8	896	112		
Dining	13.00	12.5	8	1300	162.5		
Living	7.00	19	8	1064	133		
Doorway	5.00	8	12	480	40		
First part of Master	16.00	6	10	960	96		
Master					516	24	
	Length	Width	Avg. Height	cu. Ft	sq. ft.		
Master and bath	20	19	10	3800	380		
Total Rear					565	24	
Rear Red Bedroom	14	13	12	2184	182		
Rear Green Bedroom	14	12.5	8	1400	175		
Bath	5	8	8	320	40		
Hall + Closet	24	7	8	1344	168		
Ashrae			Total ft 3	22286	2200	Energy Estimate	
			Persons	Total		24420	
	15 cfm	person	4	60			
	0.35 air changes/hr	7800.1	130.00	16667	122.9 cfm	142.45 cfm	
Required CFM for Whole House Continuous Ventilation : CFM = .01 X Floor area + 7.5 X (#bedrooms +1)				22.13		bath	20
				30		kitchen	25
			Continuous	52.13		Continuous	52
						Peak	137
Drafts below 40 fpm							
(0.20 m/s) are generally not noticed by occupants and, therefore, maintaining levels near this is recommended.							

Non-Continuous Run Time Multipliers

Based on ASHRAE 62.2, Table 4.2: This chart estimates the required cfm need for non-continuous ventilation systems

% on During Cycle	Cycle Time (Hrs); On + Off Time			
	0-4	4-8	8-12	12-24
10%	10.0	12.7	n/a	n/a
20%	5.0	6.0	8.9	n/a
30%	3.3	3.7	4.7	n/a
40%	2.5	2.7	3.1	12.5
50%	2.0	2.1	2.3	3.8
60%	1.7	1.7	1.8	2.3
70%	1.4	1.5	1.5	1.7
80%	1.3	1.3	1.3	1.3
90%	1.1	1.1	1.1	1.1
100%	1.0	1.0	1.0	1.0

- STEPS:**
- 1) Calculate required continuous rate
 - 2) Determine cycle time
 - 3) Determine % on during cycle
 - 4) Apply multiplier from table to continuous ventilation rate

EXAMPLE:
The required continuous ventilation rate for a house is 50 cfm.
The cycle time is 6 hrs.
The % on during cycle is 50%.
50 cfm x 2.1 = 105 cfm

Table 6—Ventilation Requirements Per Floor

AREA OF FLOOR	LIVING AREA (8 FT)		BASEMENT LEVEL (7 FT)		HEATED CRAWL SPACE (4FT)	
	ft²	m²	CFM	l/s	CFM	l/s
500	46		20	10	18	9
600	56		24	12	21	11
700	65		28	14	25	13
800	74		32	16	28	14
900	84		36	18	32	16
1000	93		40	20	35	18
1100	102		44	22	39	20
1200	111		48	24	42	21

Required	52 cfm	continuous	
hours	4 to 8	8 to 12	12 to 24
50%	109.2	119.6	197.6
60%	88.4	93.6	119.6
70%	78	78	88.4
80%	67.6	67.6	67.6
90%	57.2	57.2	57.2