



Air Equipment LLC *Engineering Update*

Monthly
eNewsletter

May 2018

When sizing up a wall louver, you need to know the free area. And you find that information on the manufacturer's literature, right?



- 37 1/2° BLADE ANGLE
- 6" FRAME DEPTH
- 57% FREE AREA
- ALUMINUM BUILD
- LOW MAINTENANCE



But did you know...

the Free Area percentage is correct ONLY for a louver size 48" x 48"?

8.1.2 Test sample

Air performance shall be based on tests conducted on a louver with outside dimensions of 1220 mm x 1220 mm (48 in. x 48 in.) with a tolerance of +0, -6 mm (+0, -0.25 in.).

If your louver is smaller, the Free Area percentage will be MUCH less. Your intake velocity could be so high it pulls in rain water, and your client may look like this:



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Manufacturer's literature claims the Free Area is 54%.
And at 48" x 48", it is! ($8.58 \div 16 = 0.536$, or 54%).

FREE AREA GUIDE

Free Area Guide shows free area in ft² and m² for various sizes:
Width – Inches and Meters

Height – Inches and Meters	12		18		24		30		36		42		48		54		60		66		72		78		84		96	
	0.30	0.46	0.61	0.76	0.91	1.07	1.22	1.37	1.52	1.68	1.83	1.98	2.13	2.28	2.43	2.58	2.73	2.88	3.03	3.18	3.33	3.48	3.63	3.78	3.93	4.08	4.23	4.38
12 0.30	0.26 0.02	0.41 0.04	0.56 0.05	0.71 0.07	0.87 0.08	1.02 0.09	1.17 0.11	1.33 0.12	1.48 0.14	1.63 0.15	1.79 0.17	1.94 0.18	2.09 0.19	2.24 0.20	2.39 0.21	2.54 0.22	2.69 0.23	2.84 0.24	2.99 0.25	3.14 0.26	3.29 0.27	3.44 0.28	3.59 0.29	3.74 0.30	3.89 0.31	4.04 0.32	4.19 0.33	4.34 0.34
18 0.46	0.61 0.06	0.97 0.09	1.33 0.12	1.70 0.16	2.06 0.19	2.43 0.23	2.79 0.26	3.15 0.29	3.52 0.33	3.88 0.36	4.25 0.39	4.61 0.43	4.97 0.46	5.34 0.49	5.70 0.52	6.07 0.55	6.43 0.58	6.80 0.62	7.17 0.65	7.53 0.68	7.90 0.72	8.27 0.75	8.63 0.78	9.00 0.82	9.37 0.85	9.73 0.88	10.10 0.92	10.47 0.95
24 0.61	0.87 0.08	1.40 0.13	1.92 0.18	2.45 0.23	2.97 0.28	3.50 0.33	4.02 0.37	4.55 0.42	5.07 0.47	5.60 0.52	6.12 0.57	6.65 0.62	7.17 0.67	7.70 0.72	8.23 0.77	8.75 0.82	9.28 0.87	9.81 0.92	10.34 0.97	10.87 1.02	11.40 1.07	11.93 1.12	12.46 1.17	12.99 1.22	13.52 1.27	14.05 1.32	14.58 1.37	15.11 1.42
30 0.76	1.14 0.11	1.83 0.17	2.51 0.23	3.20 0.30	3.89 0.36	4.57 0.42	5.26 0.49	5.94 0.55	6.63 0.62	7.32 0.68	8.00 0.74	8.69 0.81	9.37 0.87	10.06 0.94	10.75 1.00	11.44 1.07	12.13 1.14	12.82 1.21	13.51 1.28	14.20 1.35	14.89 1.42	15.58 1.49	16.27 1.56	16.96 1.63	17.65 1.70	18.34 1.77	19.03 1.84	19.72 1.91
36 0.91	1.33 0.12	2.13 0.20	2.92 0.27	3.72 0.35	4.52 0.42	5.31 0.49	6.11 0.57	6.91 0.64	7.70 0.72	8.50 0.79	9.30 0.86	10.09 0.94	10.89 1.01	11.68 1.09	12.48 1.17	13.27 1.25	14.07 1.33	14.86 1.41	15.66 1.49	16.45 1.57	17.25 1.65	18.04 1.73	18.84 1.81	19.63 1.89	20.43 1.97	21.22 2.05	22.02 2.13	22.81 2.21
42 1.07	1.60 0.15	2.55 0.24	3.51 0.33	4.47 0.42	5.43 0.50	6.39 0.59	7.34 0.68	8.30 0.77	9.26 0.86	10.22 0.95	11.18 1.04	12.13 1.13	13.09 1.22	14.05 1.31	15.01 1.40	15.97 1.49	16.93 1.58	17.89 1.67	18.85 1.76	19.81 1.85	20.77 1.94	21.73 2.03	22.69 2.12	23.65 2.21	24.61 2.30	25.57 2.39	26.53 2.48	27.49 2.57
48 1.22	1.86 0.17	2.98 0.28	4.10 0.38	5.22 0.49	6.34 0.59	7.46 0.69	8.58 0.80	9.70 0.90	10.82 1.01	11.93 1.11	13.05 1.21	14.17 1.32	15.29 1.42	16.41 1.53	17.53 1.63	18.65 1.74	19.77 1.84	20.89 1.94	22.01 2.05	23.13 2.15	24.25 2.26	25.37 2.36	26.49 2.46	27.61 2.57	28.73 2.67	29.85 2.77	30.97 2.88	32.09 2.98
54 1.37	2.13 0.20	3.41 0.32	4.69 0.44	5.97 0.55	7.25 0.67	8.53 0.79	9.81 0.91	11.09 1.03	12.37 1.15	13.65 1.27	14.93 1.39	16.21 1.51	17.49 1.63	18.77 1.75	20.05 1.87	21.33 1.99	22.61 2.11	23.89 2.23	25.17 2.35	26.45 2.47	27.73 2.59	29.01 2.71	30.29 2.83	31.57 2.95	32.85 3.07	34.13 3.19	35.41 3.31	36.69 3.43
60 1.52	2.40 0.22	3.84 0.36	5.28 0.49	6.72 0.62	8.16 0.76	9.61 0.89	11.05 1.03	12.49 1.16	13.93 1.29	15.37 1.43	16.81 1.56	18.25 1.70	19.69 1.83	21.13 1.97	22.57 2.11	24.01 2.25	25.45 2.39	26.89 2.53	28.33 2.67	29.77 2.81	31.21 2.95	32.65 3.09	34.09 3.23	35.53 3.37	36.97 3.51	38.41 3.65	39.85 3.79	41.29 3.93
66 1.68	2.59 0.24	4.14 0.38	5.69 0.53	7.24 0.67	8.79 0.82	10.35 0.96	11.90 1.11	13.45 1.25	15.00 1.39	16.55 1.54	18.11 1.68	19.66 1.83	21.21 1.97	22.76 2.12	24.31 2.27	25.86 2.42	27.41 2.57	28.96 2.72	30.51 2.87	32.06 3.02	33.61 3.17	35.16 3.32	36.71 3.47	38.26 3.62	39.81 3.77	41.36 3.92	42.91 4.07	44.46 4.22

But look at louver size 24" x 12":
 $0.56 \div 2 = 0.28$, or 28%

Only 28% free area?! That means the intake velocity is going to be almost TWICE what you calculated!!

(Cue up the Eurythmics: "Here comes the rain again...")

Here's why: The smaller the louver dimensions, the more space the frame takes up, as a percentage of the overall size.

Measuring the Free Area with size 48" x 48" is just an industry standard, so comparisons can be made between different manufacturers.

So, the moral of the story is: Always check the Free Area Chart for your particular louver size, to insure you're using the correct Free Area percentage.

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