AG ENGINEERING EDGE

Answers to questions about structures, ventilation, soil, water, waste, energy, machinery and safety.

Sizing attic and window fans

A common spring remodeling project is the addition of a window or attic fan to the home. Operated during summer evenings and nights, these fans are very effective at exhausting warm air and bringing in fresh, outside air through doors and windows. They also can greatly reduce the utility bills for central air conditioning.

To be effective, the fan should be able to exchange the air in the house at least once a minute. Manufacturers rate their fans in CFM, or the cubic feet of air they will exhaust per minute. (If they give both an "exhaust" and a "circulating" rating, use the exhaust rating.) To find the fan capacity you need, figure the volume of the rooms you intend to cool.

For example, an area 30 feet wide x 50 feet long, with an 8 foot high ceiling, contains 12,000 cubic feet of air. So you'll need a fan (or fans) that will exhaust at least 12,000 CFM. Large fans don't need to turn as fast as small fans to deliver the same amount of air. This cuts fan motor horsepower needs and creates less noise. The table below gives some typical fans sizes and their air exhaust ratings in CFM.

Table 1. Fan size and exhaust rating comparison

Motor H.P.	Fan Size	Overall Size	Exhaust Rating, CFM
1/4	24"	32" x 32"	5,400
1/4	30"	37" x 37"	7,500
1/3	36"	41" x 41"	10,500
1/3	42"	47" x 47"	12,400

For the fan to work right, the air intake and exhaust openings must also be sized properly. Allow at least one (1) square foot of open area for each 1,000 CFM of fan capacity. Double the opening area if insect screen or screened louvers or vents are used in the windows and attic. If vent area is restricted, the fan will not cool properly and may "rumble" or vibrate excessively.

For more details, see Cooling Your Home with Fans and Ventilation (PDF).

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