LEWIS HOME INSPECTION

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ATTIC VENTILATION

Reference Guide

MEMBER

VENTILATION

PROPER VENTILATION WILL REDUCE HEAT AND HUMIDITY

Heat comes from the sun and, in summer, a poorly ventilated attic can reach temperatures as high as 150 F- which means that even with insulation in the attic floor, the rooms below will be hotter than necessary, less comfortable, and more expensive to air condition. Excess heat also can shorten the life of some roofing materials.

Humidity comes primarily from within the house, drifting upward from showers, unvented clothes dryers, humidifiers, bathroom and kitchen exhaust fans. It also comes from other not-so-obvious sources. They very act of breathing expels water into the atmosphere-at a rate of ½ pint per hour for the average family of four! Mopping the kitchen floor (about 150 square feet) releases 4-1/2 pints of water, and washing the dinner dishes-1/2 pint.*

A windblown rain also can cause water to enter and evaporate into the attic area through roof leaks.

During cold weather, water vapor may condense in various areas of an insufficiently ventilated attic, seeping into wooden rafters or roof sheathing and rotting them. Moisture in the attic area can cause roof shingles to buckle and insulation to loose its effectiveness. It also creates an environment that is conductive to mildew.

PROPER ATTIC VENTILATION

- Prevent structural damage caused by moisture
- Increase the life of the roofing material
- Reduce energy use
- Enhance the comfort level of the rooms below the attic

Now that you know why it is crucial to maintain adequate ventilation in your attic, how do you do it? There are a variety of ways, and the right one will depend on the style and structure of your own roof.

CHECK YOUR ATTIC

First, it is wise to determine whether or not the existing ventilation is adequate. By placing a thermometer in the attic on a warm windless day to see if the temperature that is being maintained is more than 10 to 15 F warmer than the outside temperature. If it is, then more ventilation is needed.

In addition, if periodic inspections during the winter reveal any signs of condensation-such as moisture, rot or mildew- then improved ventilation would be helpful.

In addition to the free flow of air, insulation plays a key role in proper attic ventilation. In fact, the ideal attic has:

1. A gap-free layer of insulation on the floor to protect the house below from heat gain or loss
2. A vapor barrier under the insulation next to the warm ceiling below to stop moisture from rising into the attic
3. Enough open, vented spaces, properly located, to allow air to pass in and out freely
4. A minimum of 1-1/2 inches between the insulation and the roof sheathing

RULE OF THUMB:

The requirements for proper attic ventilation may vary greatly, depending on the part of the country in which the home in located, as well as the conditions at the home site such as exposure to the sun, shade and atmospheric humidity. Nevertheless, the general formula is based on the length and width of the attic itself. The minimum recommendation, set by the Federal Housing Administration, is one square foot of free vent area for each 150 square feet of attic floor- if there is no vapor barrier under your insulation. With a vapor barrier, you need half that amount.

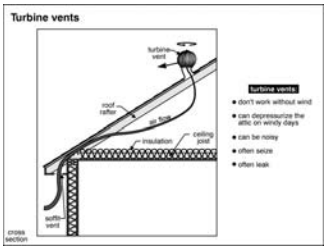
For example, 1200 square feet of attic floor would require eight square feet of free vent area, or four square feet if there is a vapor barrier.

You don't need to crawl around the attic to determine the square footage on the floor. Simply measure the length and width of the house itself and multiply them to get the necessary square footage figure.

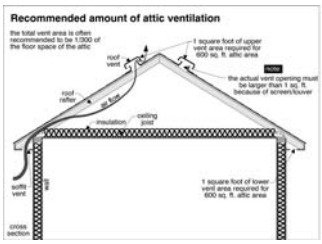
The next question is: what determines free vent area? It's not as simple as the size of the opening in which the vent sits. Louvers and screening-which are necessary to keep out rain, insects and so on-decrease the amount of air that can pass through, and that must be taken into account in calculating adequate ventilation.

OUT WITH THE OLD AIR, IN WITH THE NEW

Once you've determined your ideal total free vent area, then you need to divide it roughly in half for:
-**Inlet vents,** which should be located under the eaves (called the "soffit" area) or low on the roof face, and
-**Outlet vents,** which could be located at the roof ridge, in gables or cupolas, or otherwise near the top of the roof.



Since hot air rises, this type of system takes advantage of the natural "chimney effect" and air movement will be created through the attic, even when there is no wind. (Wind will cause an even greater movement of air.) The ridge and soffit vent combination can be applied to the majority of roofs in the country, which are gable style, or pitched. In most cases, houses of this type feature louvered openings in the end walls of the roofs;



however, unless these vents are perpendicular to the predominant breezes, their effectiveness is limited.

In regions of the country where the heat is extreme, attic ventilation can be enhanced by the use of a wind turbine exhaust vent. On a hot, still day, the heat rising up in the attic will start the turbine spinning and the more heat going out, the faster it will spin. Add a little wind and you've got something similar to a self-propelled vacuum cleaner!

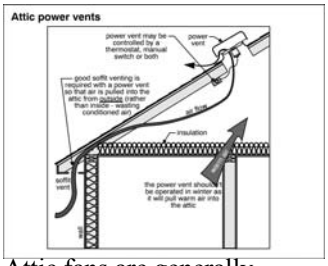
ROOFS WITH SHALLOW PITCHES

Flat roofs and roofs with shallow pitches are another story. It sometimes can be difficult to ventilate properly the cavity beneath such roofs. If there are overhangs, continuous soffit venting can be employed. In some cases, louvers placed in the fascia board will do the job.

Another important point about flat or slightly pitched roofs: Since there is very little air space between the tower ceiling and underside of the roof structure, your insulation should be at least 1-1/2 " thinner than the roof cavity. Otherwise, water condensed from moist house air can be trapped in the insulation, making it useless, and allowing rot and mildew to get a foothold.

MOTORIZING YOUR VENTILATION

Some people want to give the natural circulation created by ridge, soffit and gable vents a helping hand. In this case, the solution may be a motorized attic fan-not to be confused with a whole house fan, which is usually located in the ceiling of the top floor.



Attic fans are generally mounted on the outside of the roof structure or in a gable end. They are usually activated by a thermostat. As the temperature increases, the fan will go on automatically.

This type of fan also can be activated by a humidistat. As the humidity level increases, the fan turns on.

Ideally, attic fans should have both a humidistat and a thermostat, since ventilation is needed to remove winter moisture as well as summer heat.