

Home Inspections and Roof Ventilation

It was France, 1783. After a number of experiments, Joseph and Etienne Montgolfier sent two brave human passengers aloft to an altitude of 3000 feet for a balloon ride that covered 9 Kilometers, (about 5.6 miles), and lasted 25 minutes. All because they knew from previous experiments that their carefully crafted fabric and paper sack, filled with hot air, would rise. Even today, the sport of hot air ballooning still thrives because of this basic scientific principle. But this principle is also important to the understanding of how things work in a structure, where we refer to the concept of hot air rising *within* the structure as Stack effect.

Stack effect certainly affects a structure in many ways, but for now, it is the roof ventilation system in question. Simply put, when hot air rises in a structure it takes moisture with it. Clearly, there are seasonal influences which affect this process. Therefore, some method must be employed to ensure that high moisture has a way to escape during humid conditions and excessive heat has a way to escape during hot conditions. Understanding that hot moist air rises, it only makes sense that the most effective roof ventilation systems are those which provide openings very near the highest peak, or ridge, of the roof. These may be "can" vents, or "turtle" vents which are installed every few feet along the ridge. However, the most efficient roof ventilation system, a continuous ridge vent, is actually a vent installed along the entire length of the roof ridge. Of course, for either system to work properly there should be vents along the eaves or soffits to allow air to enter from below, thus creating a flow of ventilation.

Referencing the building code, the amount of roof ventilation required is calculated according to the size and configuration of the structure - a process outside the scope of a home inspection. However, a home inspector should be able to at least provide a rudimentary evaluation of the roof ventilation system in order to identify potentially critical defects. Oftentimes, home inspection findings document inadequate, or absent, ridge ventilation and inadequate, or absent, eave, or soffit, ventilation. Sometimes roofs are ventilated solely through vents in the gable ends - a system which could only work effectively if the laws of physics were changed to allow hot air to move sideways. Other times, lower roofs on two story structures have no provision for ridge ventilation whatsoever.

Regardless of the defect, roof ventilation is so critical that lack of proper ventilation will void most roofing material manufacturer's warranties. Further, lack of adequate ventilation can and does cause premature failure of the roofing material. For these reasons, most all jurisdictions require a roof be ventilated to current standards at the time the roof is replaced.



The picture at left shows a roof which failed after 5 years and had to be replaced – all because of inadequate ventilation.

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