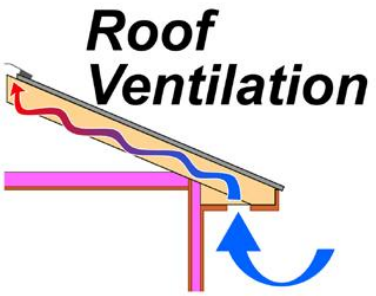
Roof Ventilation

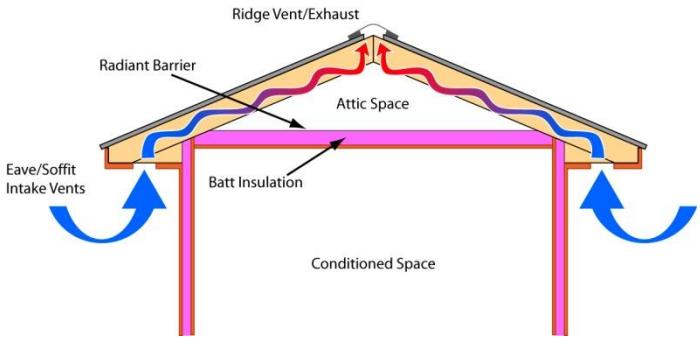


Sometimes, you really need to vent. No, not a scathing rampage at the water cooler – I'm talking about proper ventilation of commercial or residential sloped roof installations. Roof ventilation is a much misunderstood topic, for it seems counter-productive to all the energy-saving weather-sealing and insulation efforts we invest in as building improvements. In this article, I will clarify this issue, as well as "vent" a little on proper roof installations.

In simplest terms, roof ventilation prevents trapped air and moisture, allowing fresh air to circulate under the roof in the building attic space. Why do this? In cooler weather, a ventilated roof keeps the attic airspace closer to the same temperature and dew point as the outside air, which helps prevent condensation – that nasty condition which promotes mold, mildew and a wide assortment of bacterial growth in your home. Condensation has also been attributed to wood rot of decking and truss, paint blisters and damage to insulation. From the outside, proper ventilation will actually minimize winter ice buildup. During warmer weather, unventilated attic spaces may reach temperatures in excess of 150 degrees. Increased ventilation cools the roof from within, extending the life of asphalt shingles and reducing your HVAC bills.

Will ventilating a roof undo all my energy-saving efforts? On the contrary, a properly ventilated roof will enhance your weatherizing improvements by reducing the thermal load of your conditioned space while diminishing moisture condensation which minimizes the possibility bacteria and mold. If the floor of the attic space is properly insulated (which is the ceiling of your conditioned space) your heating and cooling energy is contained, and not transmitted into the attic airspace. An optimum insulation scheme is to add the maximum thermal insulation for your temperature zone, and top it with a perforated radiant barrier. Since approximately 75% of thermal transmission is through the ceiling of a conditioned space, this approach should give you a high level of comfort and energy efficiency.

In terms of air flow, a ventilated roof must have openings for hot air to exit AND openings for cool air to enter. If your roof only has roof or ridge vents and no eave/soffit vents, you essentially have no ventilation at all. A properly ventilated roof will have the same amount of outlet area as intake area.



For natural air convection, the roof vents must be a minimum of three feet above the cool air intake vents. Other considerations for air flow must be followed as well. If baffled ridge vents are used, set the vent louvers against the prevailing wind direction for best weather performance. If passive roof vents are used, space evenly below the ridge line, always on one side of the roof, not both. For metal roofing, a wide range of ridge and soffit vent systems are available. Often, builders create an air space beneath roof panels for heat convection and moisture removal. Be aware that mixing vent types may be counter-productive. Gable vents may work against ridge vents, short-cutting

airflow, and passive vents may do the same when too near a power vent. It is recommended that only one type of venting be designed and applied to a roof. Remember, we are looking for continuous, even air flow from the lower eave upward toward the ridge.

When calculating the amount of ventilation needed, the generally accepted formula is 1/300, or one square foot of ventilation per 300 square feet of attic floor. For low-slope roofs, this formula is often doubled to a 1/150 ratio. Large commercial or flat roofs need the calculations of a professional, so seek out a qualified commercial roofing contractor or architect. To determine your ventilation needs, calculate the total square footage of attic floor space in your building. Divide your total by 300 to get your total square feet of ventilation needed. Divide this number in half, since half of the venting will be outlet roof venting, and the other half will be intake or eave venting. Multiply your numbers by 144 to convert to square inches. Now, you will know the total square inches of roof and eave venting needed. There are several website that have calculators for this function. My calculator can be found at www.metalpanelsinc.com/library.html, and can be downloaded for free. Note that when figuring the ventilation for your roof, use the "net free air flow" information from the vent manufacturer. This information takes into account the air movement loss of louvers and screens, giving an actual performance indicator. One last caveat – make sure there is a free air path between the inlet and outlet vents. Insulation, flooring, or even attic storage can block the required air flow. Check the air flow path, and if necessary, install air baffles to keep air pathways clear.

Commercial or residential, steep, low-sloped or flat, all roofs need ventilation. The up-side of a ventilation project is the dramatic benefit achieved for a relatively low cost. Roof surfaces will last longer, attic air temperature and humidity will be reduced, conditioned spaces will be freer of contaminants and energy used for heating and cooling may be significantly lowered. So, go ahead and vent. You'll be glad you did.

Writer: Doug Myer

Sources: Lomanco products, www.lomanco.com/factors.html, Ron Hungarter, Licensed Contractor and Inspector, doityourself.com, Murray Anderson, freelance writer, & contributor to doityourself.com, http://www.energystar.gov/index.cfm?c=home_solutions.hm_improvement_icedams, Pro-Lab home contaminants reports, http://www.inspectapedia.com/interiors/atticcond7.htm, Roofer911.com.