Roof Venting 101: Vent the Attic Space

Proper attic area ventilation is an important performance consideration for a home or building with a steep slope roof. Typically, building codes include minimum attic space ventilation requirements, as well as the roofing industry weighing in on practical guidelines. This PK topic provides commonly accepted ventilation practices compatible with a roofglory roof system installation.

Poor ventilation practices under the roof deck can lead to excessive energy loss, ice dams, mold, and even rot.

Optimal Ventilation: Cold Climate

Ventilation seeks to maintain a cold roof temperature to avoid ice dams created by snow melt – and to vent any moisture that passes from the conditioned living space to the attic.

Optimal Ventilation: Hot Climate

Ventilation's purpose is to expel sun-heated hot air from the attic or roof, so that the building's cooling load is reduced, relieving strain on the living space air conditioning system to improve interior home comfort

Ventilation and the Building Code

Most residential building codes require enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof framing to have cross-ventilation for each separate space:

The Net Free Vent Area (NFVA) shall not be less than 1:300 of the area of the space being vented. The U.S. Federal Housing authority recommends a minimum of at least 1 square foot of attic ventilation (evenly split between intake and exhaust) for every 300 square feet of attic floor space. It is common for many homes that provide up to a 1:150 NFVA calculation of the attic area being vented. Adjust your NFVA calculation accordingly to verify that proper balance of intake-to-exhaust venting is provided.

Building codes suggest balancing the attic ventilation intake and exhaust ventilation. In all cases, we want to avoid an attic space that becomes depressurized – by having equal, or slightly more intake venting than exhaust venting – an even balance would be a 50/50 split between the eaves and the ridge exhaust point. A slightly pressurized attic space (a 50/50 to slighty greater ratio of eave inlet vent area-to-ridge vent exhaust area) further helps prevent a depressurized condition that can suck conditioned air out of the home, thus wasting air cooling money.

Mr. Smith has an attic space measuring 25 feet by 45 feet, for a total area of 1,125 square feet. He then divides this measurement by 300, for a total of 3.75 square feet of total ventilation space needed to properly vent his attic.

Mr. Smith then converts this figure to square inches: 3.75 NFVA x 144" per sq. ft. = 540 sq. inches of NFVA.

Mr. Smith then splits this NFVA total area between the soffit vent need and the roof ridge vent need: 50% of 540 sq. in. = 270 sq. in. for the soffit vents — 50% of 540 sq. in. = 270 sq. in. for the ridge vents (provide NO LESS than a 50/50 balance between eave and ridge vent area – up to a 55/45 to 60/40 ratio to prevent a depressurized attic space.

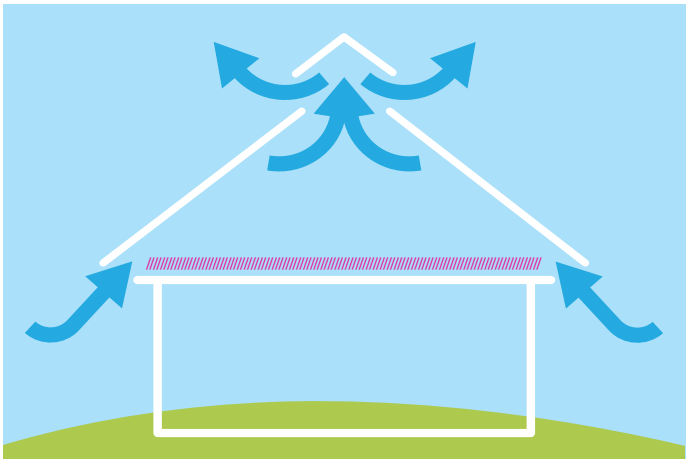
Mr. Smith has a simple roof with 2 gable ends. His soffit vents provide 9 NFVA per running foot of installation: 270 sq. in. divided by 9 = 30 lineal feet of soffit vent intake; or, 15 lineal feet of soffit intake vent total per front side and back side of his home (soffit runs along the front and back of the home – not the sides – with gable ends).

His ridge vent material provides 12 NFVA per foot rating: 270 sq. inches divided by 12 = 22.5 lineal feet of ridge vent exhaust run.

Air space of no less than 1" minimum must be provided between any applied attic insulation and the roof sheathing. Yet, ideally this should be a 2" minimum airspace between the back of the roof sheathing and the top of the insulation, to ensure sufficient airflow thru the roof assembly. Use of a rigid foam ventilation baffle at the attic eave area will avoid the situation where attic insulation often restricts ventilation flow from eave to ridge, thus inhibiting proper exhaust flow out of the attic space.

Ventilation openings must be protected to prevent rain or snow infiltration.

In wildfire-prone areas, additional care is necessary to prevent air-borne burning embers from entering thru vent screens, especially in the eave/soffit vent units. Make sure that vent units in this situation are constructed of flame resistant materials that won't allow embers to pass through to the attic space.



Make every attempt to seal the attic floor/interior ceiling completely – air leaks around light fixtures, plumbing vent pipe penetrations and thru attic space HVAC duct leaks are major contributors to energy loss in all climates, while being a primary contributor to roof ice dams in cold climates.

Soffit vents should be located as far to the outside edge of the soffit as possible. Otherwise, warm air next to the heated siding can rise, enter the vent, melt snow, and contribute to ice dams forming.