

TOP FIVE ATTIC VENTILATION FAQs

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You've Got Attic Ventilation Questions. The RAVC Has Answers

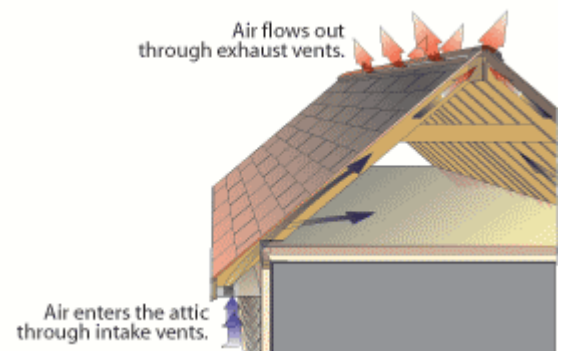
By: Paul Scelsi, Air Vent, Inc., on behalf of the Roof Assembly Ventilation Coalition

On the surface attic ventilation may not *appear* to be a “top of mind” concern for contractors working on the roof and inside the attic. After all, there’s insulation, underlayment, shingles and flashing to tackle, too. However, based on the volume of questions the member companies of the **Roof Assembly Ventilation Coalition** (RAVC) receive about attic ventilation, it is clear contractors are thinking about it. Here are the five most commonly asked and answered questions the RAVC receives.

Q: Why is it important to ventilate the attic – what’s its purpose?

Attic ventilation provides year-round benefits to help fight heat buildup in the summer, moisture buildup in the winter, and ice dams in climates with snow and ice.

This helps to prolong the life of the building materials – including the shingles, helps to improve the comfort level inside the home, and helps to lower the utility bills by reducing the load on the air conditioner and other appliances such as fans and refrigerators. RAVC member companies have case studies documenting these benefits.



The summertime benefits of attic ventilation are often more obvious to the contractor than the wintertime benefits. That’s understandable. It’s not too difficult to realize the attic can get very hot in the summer, and if that hot air is not properly removed through ventilation it can become problematic. However, the wintertime benefits are less obvious, but – quite possibly – more important. That’s because the average family of four generates an estimated 2 to 4 gallons of water vapor each day through activities such as cleaning, showering, breathing, etc. (see *Moisture Control in Buildings*, Heinz R. Trechsel). Some of this water vapor rises into the attic. In the summertime, the outdoor air temperature – as well as the air inside the attic — is warmer than it is in the winter, and warmer air can hold more moisture than cold air can. But in the winter, the amount of water vapor that the air can hold is substantially lower. As a result, it can condense as frost or water droplets, drip onto the [attic insulation](#), and, in time, contribute to mold, mildew, wood rot and poor indoor air quality.

Proper attic ventilation prolongs the life of the building and reduces utility bills.

Q: How much ventilation does an attic need?

The starting point for any attic ventilation project is always, “What is the size of the attic space to be vented?” The International Residential Building Code (IRC) defines attic size in terms of its square footage— length x width, floor of the attic. Once a contractor knows the attic square footage, the amount of necessary attic ventilation can be calculated.

The code minimum for attic ventilation in the 2012 IRC, Section R806 – Roof Ventilation[1] is as follows: 1 sq. ft. of Net Free Area for every 150 sq. ft. of attic floor space. This means, for every 150 square feet of attic floor space there should be 1 square foot of Net Free Area. (**NOTE:** While the IRC does not address the need for more attic ventilation as the volume in the attic rises with roof pitch increase, member companies of the RAVC do in their various resources).

Q: What’s the ideal way to ventilate an attic?

It is the recommendation of the RAVC that the attic ventilation system always be balanced. This means an equal amount of intake net free area through vents positioned in the soffit/overhang or near the roof’s lowest edge and exhaust net free area through vents installed at or near the peak of the roof. This allows cool, dry air to enter the attic at the lowest point helping to remove any warm, moist air from inside the attic through the exhaust vents – along the entire underside of the roof deck. RAVC member companies have an extensive offering of intake and exhaust vents.

If the attic ventilation system cannot be balanced 50% intake/50% exhaust, it’s better to have more intake than exhaust because it’s been our experience most houses lack proper intake. Additionally, any excess intake will become exhaust on the leeward side of the house because the intake vents on the windward side of the house will have “pressurized” the attic. As a result, the intake vents on the leeward side of the house will work “with” the exhaust vents to release air.

However, if the attic has more exhaust than intake it is potentially problematic because the exhaust vents could become intake to compensate for the lack of balanced intake. For example, a ridge vent could pull air from its back side if it can’t obtain air from intake vents. Or, a wind turbine could pull air from a nearby wind turbine on the same roof because there is not enough intake low on the roof to pull from. In either scenario, the exhaust vent is potentially ingesting air and weather which it’s not designed to do.

Q: The more exhaust vents on the roof the better it is for the attic, right?

Well, it depends. If it’s more of the same type of exhaust vent, it is OK (as long as it does not exceed the amount of intake as explained earlier.). But if it’s a combination of types of exhaust vents, it’s potentially problematic.

In general there are five types or categories of exhaust vents: ridge vents, power fans (traditional electric and solar powered), wind turbines, gable louvers, and roof louvers. The RAVC recommends never mixing two types of exhaust vents on the same roof above a common attic because it could short-circuit the attic ventilation system. Here’s how it can happen. Air follows the path of least resistance. That path is supposed to be from low in the attic (intake vents) to the highest possible exit point in the attic (exhaust vents). If two different types of exhaust vents are combined (for example, a ridge vent and a gable louver) the primary path of air becomes the distance between the two types of

exhaust vents. That short-circuits the proper flow of air and could cause one of the exhaust vents to ingest weather because it is suddenly functioning as an intake vent.

When it comes to intake vents, by the way, it's OK to mix multiple types on the same roof (for example, rectangular under-eaves and roof-top installed edge of roof vents) because they will be in the same wind pressure zone working together. That is not the case with multiple types of exhaust vents.

Q: How are multiple ridge heights handled?

The rule of thumb for ridge heights states that all ridges can be vented whether they run parallel or at angles to each other. If, however, the ridges are more than 3 feet apart in height, only ventilate the higher one or separate the attics. As wind passes over an externally baffled ridge vent, it creates low pressure zone, drawing air from the attic. The faster the wind moves over the baffle, the greater the pressure it creates. Typically, wind moves faster at higher elevations, therefore, the higher ridge will be exposed to high wind speeds. If the wind speed difference is adequate, the pressure at the higher ridge may be enough to pull air into the lower ridge vent. Thus, it's best to separate the attics with plywood or poly sheeting to create two distinct attics. Once the attics are separated, ventilating all of the ridges is acceptable.

If you have additional questions after reading our list of the Top Five Attic Ventilation FAQs, please send them to the RAVC at info@ravcoalition.org.

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*By Paul Scelsi, Air Vent, Inc. Scelsi is Chairman of the **Roof Assembly Ventilation Coalition**, whose mission is to be the leading authority and technical resource on ventilated roof assembly design and performance.*

[1] In part, the IRC states: Enclosed attics and enclosed rafter spaces formed where ceilings are applied to the underside of the roof rafters shall have cross ventilation for each separate space. ...The minimum net free ventilation area shall be 1/150 of the area of the vented space. ...Exception: The minimum net free area shall be 1/300 of the vented space provided one or more of the following conditions are met: 1) In Climate Zones 6,7 and 8, a Class I or Class II vapor retarder is installed on the warm-in winter side of the ceiling. 2) At least 40% and not more than 50% of the required ventilating area is provided by ventilators located in the upper portion of the attic rafter space...with the balance of the required ventilation provided by eave or cornice vents. **Check local codes for any differences between the IRC and local municipalities.**