

Q I usually use ridge vent and eaves vent to ventilate the attics in the homes I build. How do you calculate the requirements for that type of system, and do they change when the roof pitch changes?

A Paul Scelsi, presenter of Air Vent's "Ask the Expert" seminars, responds: Most of us understand that proper attic ventilation can keep an attic cooler during warmer months, but it also helps to reduce moisture and to keep an attic dry during colder months. Proper attic ventilation can also help prevent destructive ice dams from forming.

Installing a balanced attic ventilation system is the key, and one of the best ways to do this is with paired ridge and eaves vents. This system uses thermal flow (warm air rising) plus the effect of wind blowing over the ridge to draw air out at the ridge and take in fresh air at the eaves. But no matter what type of vent you use, the system must be balanced to work properly.

"Balanced" in this case means that the net free area (NFA) of the intake vent at the eaves or low on the roof must be equal to or greater than the NFA of the exhaust vent at or near the ridge. So for a typical gable roof, the NFA of the eaves vent along each side of the roof should be at least half the NFA of the ridge vent at the peak.

Section R806.2 of the IRC says that in most cases a

1:150 ratio (NFA of vent to total attic square footage) should be used to determine the minimum size requirements for the vent. So for an attic that's 1,000 square feet, you would divide 1,000 by 150 to calculate that 6.6 square feet NFA of ventilation would be required. To achieve a balanced system, half that amount is intake and the other half is exhaust, so each should be 3.3 square feet or 475 square inches. Most vent manufacturers supply the NFA for their products, so use their figures to determine how many linear feet of the product you need to install to meet code requirements.

The second part of your question is trickier. Unfortunately, the building code doesn't address—or ask roofing professionals to factor in—the actual volume of space under the roof. The volume for a 1,000-square-foot attic under a 12:12 pitch roof is not the same as the volume under a 5:12 pitch. In Air Vent's educational seminars and in the online calculator at airvent.com, we recommend increasing the ventilation by 20% for roofs with a pitch from 7:12 to 10:12. For roofs steeper than that, we recommend increasing ventilation by 30%.

Calculating Ventilation

