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.

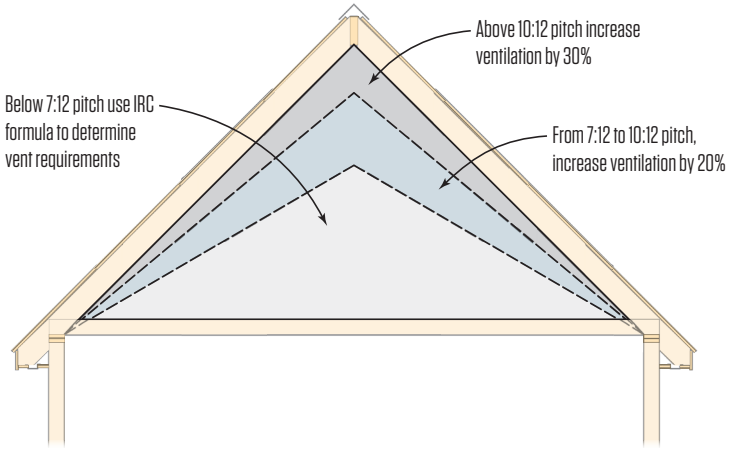
Installing a balanced attic ventilation system is the key, and one of the best ways to do this is with paired ridge and eaves vents. This system uses thermal flow (warm air rising) plus the effect of wind blowing over the ridge to draw air out at the ridge and take in fresh air at the eaves. But no matter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



Q What type of weather resistive barrier (WRB) should be used behind brick veneer?

A Matt Risinger, owner of Risinger Homes, a custom builder and whole-house remodeling contractor in Austin, Texas, responds: When selecting the proper WRB for behind a brick veneer, it's important to understand that brick is not waterproof. In fact, brick is highly porous and absorbs water readily, so it cannot and should not be depended on to stop moisture from entering a wall system.

You also need to realize that brick gives up its moisture pretty readily. That means that it dries quickly to the outside under most conditions. The one exception is when the sun beats down on moisture-laden brick. In that case, solar-driven moisture from the brick is pushed into the air space behind the brick, and unless the proper WRB is in place, the wall sheathing on the other side of the air barrier can be at risk.

I recommend using a WRB with a perm rating lower than that of conventional housewrap. A lower rating means that the WRB is less likely to let moisture from the air space behind the brick reach the wall sheathing. A product like Tyvek CommercialWrap has a perm rating of 23 to 28—compared with a perm rating of 58 for regular Tyvek HomeWrap—and is a better choice for a WRB behind brick veneer. When I'm applying a WRB to sheathing before installing brick veneer, I like to put on a layer of CommercialWrap and cover that with a layer of 15-pound felt as added protection.

I do most of my work in the hot, humid south. In my area, a peel-and-stick membrane, which typically has a perm rating of less than one, can be used as a WRB behind brick veneer. An important caveat for this application is that you must be sure there is no additional vapor barrier inside the walls of the house that could trap moisture and cause damage inside the walls.

Drainage detailing with brick veneer is just as important as the type of WRB material that you choose. All penetrations such as windows and doors should have through-wall flashing that's integrated into the drainage plane at the sheathing. Through-wall flashing should also be used at the base of the wall, along with weep holes to let any accumulated moisture drain away safely. And finally, I always install mortar net at the bottom of the air space. This mesh product is designed to catch and trap mortar that falls while the brick veneer is being constructed, to keep the weep holes free of debris.

Q Do you have any quick tips for keeping air tools and compressors running smoothly in cold weather?

A Jim Glover, a building contractor in Pierre, S.D., responds: Severe cold can affect all the tools and materials used in construction, but none more dramatically than pneumatics. And when it's too cold to be reaching into my nail bags with fingerless gloves, I depend on my air nailers and staplers even more. Several years ago, I wrote an article for *JLC* titled "Cold Weather Tool Care" (Feb/08); here are the highlights of the section on pneumatics.

Keep tools acclimated to the temperatures you're working in. If you're working in the warm indoors, store your tools and compressor in a warm place or let them warm up to room temperature before using them. If you're working in the cold, store your compressor in the cold (such as in your truck), and don't put your compressor indoors with hoses run outdoors to where you're working. (Otherwise, moisture in the warm air will condense and freeze in the cold hoses.) If you work in cold, moist conditions, it may help to install an in-line desiccant drying system to keep your hoses from clogging with frost.

Use a winter-grade lubricant made for pneumatic tools in your guns. When working consistently in temps below 20°F, I use a de-icer, such as Kilfrost 400 (kilfrost.com).

Avoid using ¼-inch-diameter hoses that clog with frost easily.

Finally, use a magnetic oil pan heater to warm up the oil in your compressor to get it started. Once the compressor is running, the oil should stay warm enough without the heater.