Low-Profile Ridge Vents

by Sal Alfano and Clayton DeKorne

A buyer's guide to the latest shingle-over ridge vents

In the last decade, a number of "low-profile" ridge vents have come on the market. Unlike conventional metal ridge vents, the new vents can be shingled over so they are hardly visible against the rest of the roof.

We chose to evaluate nine low-profile ridge vents, including Cobra Ridge Vent, Cor-A-Vent, Highpoint Vent, Ridge Master, Roll Vent, Shingle-Over Ridge Vent, Shinglevent II, Top Cat, and Venturi Vent. All of these are widely available.

Our investigation was prompted by questions from readers about which vents work best, and by reports of windblown snow leaking through some types of low-profile vents.

To evaluate each product, we installed the vents along a 30-foot gable roof with a 4:12 pitch and soffit vents on both sides. We observed the vents through one Vermont winter, looking for any signs of water or snow infiltration. In addition, we compared specifications and evaluated each product for durability and ease of installation.

Low-profile ridge vents are capped with shingles to visually blend the vent with the rest of the roof.

Net Free Vent Area

How much air actually e... out a ridge vent under various wind and temperature conditions is anyone's guess. Little testing has been done, and since there are currently no standard tests, one vent's performance cannot be meaningfully compared to the next one's (see "The Science of Venting").

Regardless, most building codes, as well as roofing material warranties, require attic ventilation. Both base their attic venting requirements on the FHA Minimum Property Standards (see table at right). The standard spells out an attic's minimum "net free vent area," which is defined as the unobstructed area of a vent opening. While this isn't an ideal measure of the vent's performance, it's currently the best there is.

The net free vent area of manufactured vents is usually calculated by the manufacturer. One trade association, the Home Ventilating Institute (HVI), has proposed a standardized way of measuring vent area. However, only two of the vents we looked at carry HVI certification for net free vent area — the Shingle-Over Ridge Vent and Cor-A-Vent. At this point, the association has no way to accurately calculate the openings in a fibrous material, which some of the other vents are made of.

Manufacturers of ventilation products usually list the net free vent area in square inches. To convert to square feet, divide the number of square inches by 144. If you are building your own soffit vents, keep in mind that net free vent area includes only the unobstructed openings. Screen and louvers will reduce the airflow. For example, if you cover a vent with 8x8 screen (64 openings per inch), you have to oversize the vent by 25%. If you use both louvers and screen, you have to oversize it by 125%.

One final note: Don't use gable-end vents with ridge vents. Wind will simply blow into the gable end and exhaust directly above it with-

lrawing air from the rest
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vents, instead.

ost of the ridge vents we
ed at fit one of two gen-
l categories — roll-out
panel types. One — Cor-
Vent — stands in a
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ll-Out Vents

ne roll-out vents —
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ent — are made of a
matrix and have the
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and 3/4 inch. Nothing
beats these for speed of
installation. They can
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act as a filter to effec-
prevent rain or snow
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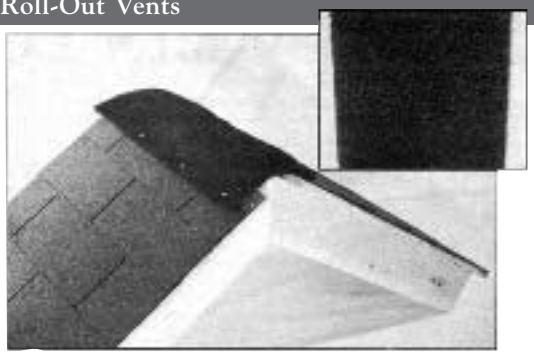
ile there are some ques-
tions about how well
air flows through vents
with fibrous filters,
both vent manufactur-
ers have estimated the
net free vent area using
a calculation that mea-
sures the density of the
fibers at the exposed
edges. By this method,
both vents exceed all
code requirements for
minimum net free vent
area. Care should be
taken, however, when installing the vents. Both vents can be crushed if the cap shingles are overnailed, decreasing the vent area.

The material is flexible and the roll-out vents are the only ones we looked at that can be easily used on irregular roof surfaces, such as shake and tile.

FHA Minimum Property Standards for Roof Ventilation

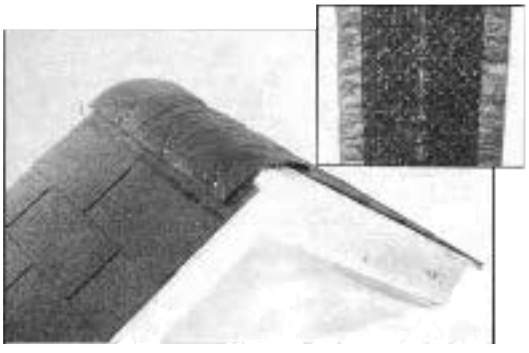
Construction	Total net free vent area of all vents as a proportion of attic floor area
No ceiling vapor barrier	1/150
Vapor barrier in ceiling *or* At least 50% of required vent area is in upper half of attic space	1/300

Roll-Out Vents



Cobra Ridge Vent Specifications:
Net free vent area: 12 sq.in./l.f.
Material: Polyester matrix
Baffle type: None
Filter: Matrix design acts as filter
Height off roof: 5/8 in.
Order quantity: 20- and 50-foot rolls
Manufacturer: Berger Building Products Corp., 805 Pennsylvania Blvd., Feasterville, PA 19053; 800/523-8852.

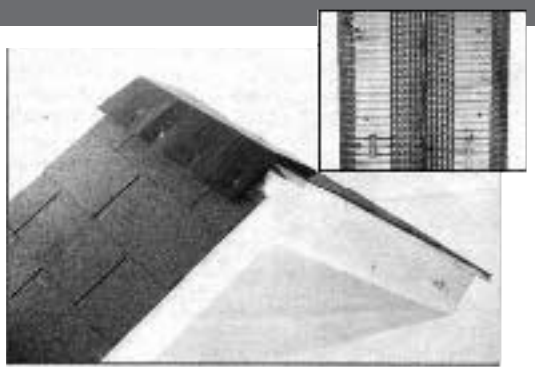
Comments: Cobra Ridge Vent is the most flexible product available, so it will conform well to irregular roof surfaces, such as shakes and tile. And because it is made of a homogeneous material, it can be cut lengthwise to fit below narrow cap shingles. It relies on the density of the matrix to prevent infiltration of rain and snow, but it doesn't have a baffle to redirect wind.



Roll Vent Specifications:
Net free vent area: 18 sq.in./l.f.
Material: Nylon
Baffle type: None
Filter: Nylon-polyester fabric
Height off roof: 3/4 in.
Order quantity: 20- and 50-foot rolls
Manufacturer: Benjamin Obdyke, John Fitch Industrial Park, Warminster, PA 18974; 800/458-2309.

Comments: Roll Vent is stiffer and less tightly woven than Cobra Vent, but it will still conform well to irregular surfaces. It is wrapped in a filter fabric. The fabric covers the factory end of a roll, but on a cut piece, you have to cut back the nylon matrix and wrap the fabric around to prevent entry of windblown rain and snow.

Cor-A-Vent



Cor-A-Vent V-400 Specifications:
Net free vent area: 18 sq.in./l.f.
Material: Polyethylene
Baffle type: None
Filter: None
Height off roof: 1 in.
Order quantity: 12 pcs./box
Manufacturer: Cor-A-Vent, 16250 Petro Dr., Mishawaka, IN 46544; 219/255-1910.

Comments: Cor-A-Vent is made of built-up layers of corrugated plastic, which form numerous small tube-shaped openings. The material is stapled together and, when you cut it, pieces can fall apart if they do not include a staple. Cor-A-Vent is narrow, so it's less visible, but there is also less bearing on the roof. This makes it more difficult to install on very steep pitches unless you split it lengthwise along the hinge and install the half-panels separately. According to the manufacturer, this vent can be used on roof hips.

Expect to pay between $2.25 and $2.50 per linear foot for roll-out vents.

Panel Vents

The panel-type vents are made in 4-foot plastic segments and fit roof pitches between 3:12 and 12:12. (Shinglevent II and Venturi vents are rated by the manufacturers for pitches up to 16:12.) The Ridge Master and Highpoint vents are scored lengthwise to form a "hinge," which creates a sharper angle at the ridge. The panels without a hinge are more difficult to bend over a steep pitch, but have a nice rounded finished appearance on any pitch. The rounded ridge also makes sitting on the vent all afternoon installing cap shingles noticeably more comfortable.

All six panel-type vents we looked at stayed flexible during cold weather installation. About half have tabs for quick alignment and maintaining a uniform distance between panels. The Ridge Master has a T-shaped tab on each end that actually interlocks. On vents without alignment tabs, be careful to leave an 1/8-inch space between panels to allow for expansion.

Also beware of architectural-type shingles. The extra layer of asphalt on these shingles can hold the edge of the panel up off the roof, allowing rain and snow to blow in underneath (see Figure 1). With architectural shingles, strip off the extra layer and caulk the joint between the vent and the roof.

The panel vents all have foam end-blocks to seal the vents at gable ends. The Ridge Master has an additional plastic fin that protects the foam, and the foam block that comes with the Highpoint vent has a protective coating on one side. On all the others, the foam is exposed to the elements and may be less durable.

Each panel vent is designed to keep out windblown rain and snow. Some use external or internal baffles or both; some include a filter, as well.

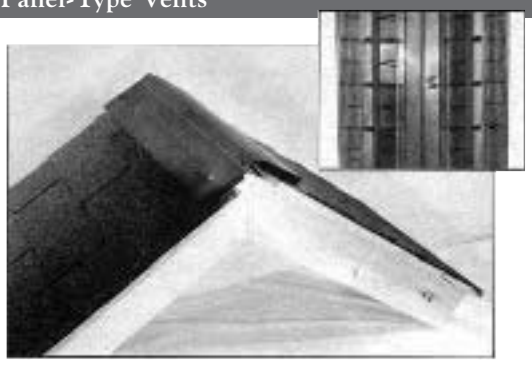
External baffles are vertical flanges in front of the vent opening designed to redirect wind currents over the top of the vent. This reportedly creates negative pressure that draws air out of the attic. In addition, the baffle prevents wind from blocking the exhaust airflow and from driving rain and snow into the roof.

Internal baffles overlap within the vent to create an obstacle course to catch snow or rain as the wind blows through. Many of the vents include an additional louvered grill on the exterior of the vent to keep out insects and debris. Similarly, Ridge Master has a foam filter and Shinglevent uses a fiber filter.

Most of the molded panels can be cut with a razor knife. But for those with solid internal baffles, a circular saw works best. The cut

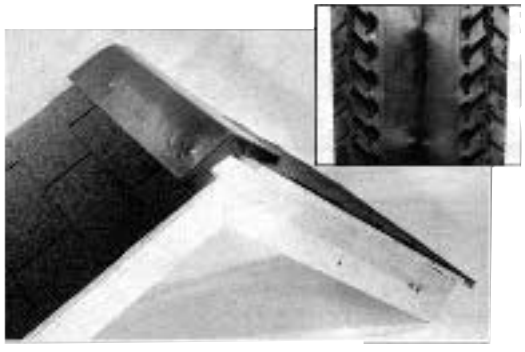
Figure 1. *The extra layer of asphalt on architectural-type shingles can hold the edge of the vent off the roof, allowing rain and snow to blow in below the baffles. To remedy this problem, strip off the extra layer from the shingle and caulk along the bottom edge of the vent.*

Panel-Type Vents



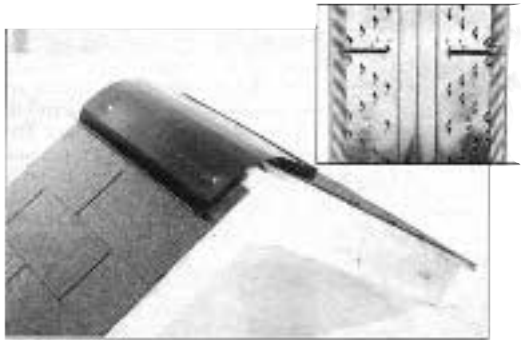
Highpoint Vent Specifications:
Net free vent area: 18 sq.in./ l.f.
Material: Polypropylene
Baffle type: External and internal
Filter: None
Height off roof: 7/8 in.
Alignment tabs: Slot-and-tab
Order quantity: 12 pcs./box
Manufacturer: North American Building Products, 749 E. Mandoline, Madison Heights, MI 48071; 800/521-9920.

Comments: The top-of-the-line Series 5 (shown) comes with a 40-year limited warranty — the longest of any vent we looked at. It has two sets of internal baffles, plus an external baffle to direct wind over the roof. North American Building Products also makes two other versions of the Highpoint Vent with slightly lower net free vent areas and different baffle configurations. All three use small foam end-blocks with a weather-resistant coating on one side.



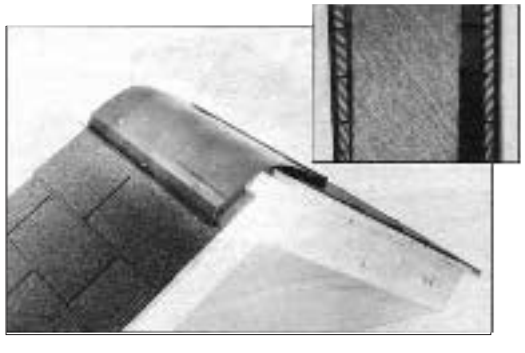
Ridge Master Specifications:
Net free vent area: 12.2 sq.in./l.f.
Material: Thermoplastic olefin
Baffle type: Internal
Filter: Foam
Height off roof: 3/4 in.
Alignment tabs: Interlocking
Order quantity: 10 pcs./box
Manufacturer: Mid-America Building Products, 9246 Hubbell Ave., Detroit, MI 48228; 800/521-8486.

Comments: Ridge Master uses T-shaped interlocks at the ends to align adjoining pieces and keep them from spreading. Seven nail bosses on each side of the panel keep the fasteners straight when driving them and prevent over-compressing the vent during installation. A set of embossed markings on top of the panel helps to space the cap shingles evenly. An integral, molded tab completely closes the end to the weather and protects the friction-fit foam end-block. The manufacturer claims that, with the addition of a waterstop strip, its Hipmaster Vent can be used on roof hips.



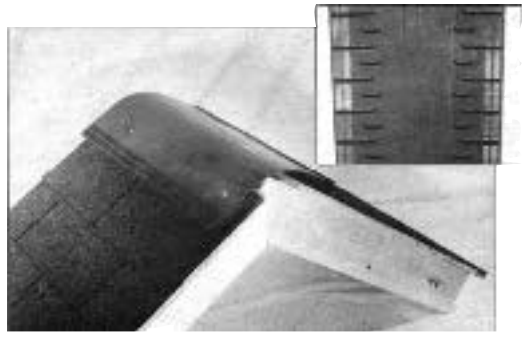
Shingle-Over Ridge Vent Specifications:
Net free vent area: 17 sq.in./l.f.
Material: Polypropylene
Baffle type: External and internal
Filter: None
Height off roof: 1 1/16 in.
Alignment tabs: Slot-and-tab
Order quantity: 12 pcs./box
Manufacturer: The Solar Group, P.O. Box 525, Taylorsville, MS 39168; 800/647-7063.

Comments: The Shingle-Over Vent proved to be the most durable panel-type ridge vent that we looked at. Not only is the material slightly heavier, but the internal baffles give good support to the shell. Five nail bosses on each side prevent overnailing and simplify installation. Two foam blocks, which lock neatly into tabs at the end of the panels, are provided in each box.



Shinglevent II & Venturi Vent Specifications:
Net free vent area: 18 sq.in./l.f.
Material: High-density polyethylene
Baffle type: External
Filter: Woven fiber (Shinglevent only)
Height off roof: 1 in.
Alignment tabs: None
Order quantity: 9 pcs./box
Manufacturers: Air Vent (Shinglevent II), 4801 N. Prospect Rd., Peoria Heights, IL 61614; 800/247-8368, and Browning Metal Products Co. (Venturi Vent), 4805 N. Prospect Rd., Peoria Heights, IL 61614; 800/841-8970.

Comments: Certainteed Corp. owns both Air Vent and Browning Metal Products, and the two vents are identical in most respects. They have a "positioning" hole in the middle of each side, but no other nail bosses. The large rectangular foam end-blocks must be ordered separately. The difference between the two vents is that Air Vent includes an internal fiber filter in the Shinglevent II to help keep out rain and snow. The Shingelvent II also comes in five colors; Venturi vents are available only in black.



Top Cat Specifications:
Net free vent area: 15 sq.in./l.f.
Material: Polypropylene
Baffle type: Internal
Filter: None
Height off roof: 3/4 in.
Alignment tabs: Slot-and-tab
Order quantity: 15 pcs./box
Manufacturer: Greenstreak Plastic Products, 3400 Tree Court Industrial Blvd., St. Louis, MO 63122; 800/727-1559.

Comments: The Top Cat is 14 inches wide overall — the widest vent we looked at — so it stands out more against the ridge than other vents. Because the exhaust louvers are flush with the top of the vent, there is no "gutter" to clog up, but the cap shingles must be cut accurately to keep from blocking the airflow. Its light gray color may also be more noticeable on dark roofs. Foam blocks are provided to close the ends.

INTERVIEW

THE SCIENCE OF VENTING

Although all codes require venting and most experts recommend it, surprisingly little is known about how venting actually works and whether it is needed in all cases. To shed some light on the key technical issues, we spoke with building researcher William Rose of the University of Illinois, who has been studying roof ventilation for the past several years.

JLC: *Why vent a roof?*
Rose: Most of the benefits of venting stem from the fact that it reduces the temperature range in the attic. An unvented attic gets considerably hotter (by 30°F) on a sunny afternoon, and may get slightly colder on a clear night than a vented attic.

With venting, therefore, summer cooling bills will be lowered. The savings are worth considering in most of the U.S., even in attics with R-30 insulation. Also, asphalt shingles are likely to last longer over vented attics due to the cooler temperatures.

During cold weather, venting in the attic will reduce the likelihood of ice damming by keeping the roof surface more uniform in temperature, helping to prevent warm spots that melt snow and allow it to refreeze at the eaves.

In addition, preliminary findings show that venting does indeed reduce the accumulation of moisture in the sheathing (but not necessarily in all cases). In our side-by-side tests, on clear cold nights, we did see greater frost accumulation in unvented attics than in vented attics. The slightly colder attic temperatures may have played a part. However, don't rely on attic ventilation alone to take care of an overly moist attic. Instead, seal the ceiling air leaks!

JLC: *Will a balanced soffit/ridge vent solve all gable roof problems, such as condensation, mildew, ice damming, etc.?*
Rose: The best protection against condensation and mildew problems in the attic is an airtight ceiling plane — one that allows no air leaks from the house below. The most damaging air leaks are those leading from damp foundation spaces, such as uncovered crawlspaces, up into the attic. These leaks typically pass through chases, plumbing walls, and oversized holes in the partition plates for plumbing and wiring.

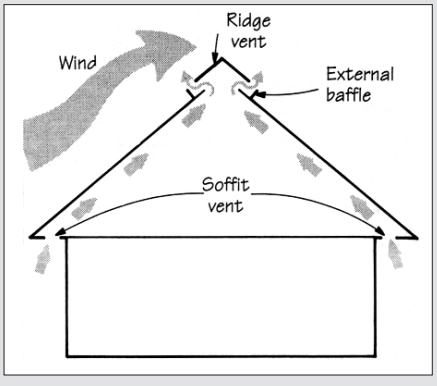
The best ice-dam prevention I know is venting along the underside of the sheathing with soffit and ridge vents and installing a modified roofing membrane at the eaves, just in case an ice dam does occur.

JLC: *What does "balanced" mean?*
Rose: In our field test setup, we are comparing two attic types: *vented* and *unvented*. The vented type has a 1:150 ratio of net free vent area to attic floor area, no vapor barriers, and venting split about 50/50 between ridge and soffits. The ridge vent is a baffled filter vent from Air Vent, and the soffit vents are perforated panels. (Air Vent is a subsidiary of Certainteed Corporation, the principal sponsor of the research.)

The unvented type has the same configuration, but with cap shingles rather than a ridge vent and no perforations in the soffit. All the attics have a 5:12 pitch.

I suppose our vented attic configuration would be considered balanced. However, when the term "balanced" comes up, I think most of us picture air coming in through soffits and exiting through the ridge, in about the same amounts, following the arrow we see in venting diagrams. In real attics, however, the airflow rarely follows the arrows.

Our research shows that wind, not thermal buoyancy, is the driving force for air exchange between the attic and the outdoors. (Thermal buoyancy may play a role in air movement from the indoor space to the attic, especially in tall buildings, but its role in diluting attic air with outdoor air is negligible.) The wind enters an attic on the *windward* side and exits on the *leeward*, or downwind, side. Unless a ridge vent is designed just right, the air can blow in one side and out the other, not helping with ventilation. The amount of suction a ridge vent develops depends on its aerodynamic properties.



External baffles help deflect windblown snow and rain over a ridge vent and help increase suction at the ridge, according to ventilation research.

For this reason, I consider soffit vents to be the critical component in any venting system. In fact, if a roof had to have only one vent device, I would opt for soffit vents: They perform well as either intake or exhaust ports, and since their holes point downward, they have one line of protection against snow intrusion.

Soffit vents are necessary to accompany any high vents as well: If the high vent does exhaust air, it will pull makeup air from inside the house if it can't get it from outside. This could bring additional moisture into the attic. For this reason, BOCA is currently studying whether to require that all venting systems be tilted toward enlarged soffit vents.

JLC: *How does the shape and size of the vent openings affect airflow? Can you vent just one side of a roof?*
Rose: For the purpose of this question, let's assume that increasing the air exchange rate is the principal function of attic vents. Then, vent performance hinges on two things: *aerodynamics* and *resistance to airflow*.

First, aerodynamics. I've seen the results of a test developed by Air Vent that compares their baffle vent with competitors' vents, both with and without external baffles. The test was designed to see how much negative pressure is created in a closed (no soffit vent) attic space by a wind passing perpendicular to the ridge. The results showed that ridge vents with baffles do create greater suction at the ridge than vents without baffles. Of course, the test was manufacturer sponsored, and it is not a standard test. Nevertheless, I feel that the development of a standard test is long overdue, and this is a step in the right direction.

Second, resistance to airflow. Occasionally, manufacturers state the flow rate of soffit or ridge vents measured at .5 inch of water pressure difference. However, our experience, and that of researcher Tom Forest at the University of Alberta, is that the air pressure differences between an attic and the outdoors will rarely exceed .04 inch of water, which is at least ten times lower than the rate used to test the vents. So we don't know at this point how various products work under real conditions.

Net free area calculations give only a rough indication of a product's resistance to airflow, but they do offer a simple basis for comparison. Vent openings can be many sizes. I happen to think 1/8 inch is about right — not so small as to be likely to clog like a filter, but still excluding many insects and most squirrels.

As for venting only one side of the ridge, you are asking for trouble. That vent will be an intake vent whenever the wind comes from that side of the roof. The air exchange rate may be fine, but there is an increased risk of snow entry.

JLC: *What affects the airflow rate? Roof pitch? Size of the attic?*
Rose: Here's how I would rate the variables in order of importance, based not on data but on intuition and experience:

1. Exposure to wind on the site.
2. Soffit vents well distributed with low resistance to airflow.
3. Ridge vents with good aerodynamics and low resistance to airflow.

Then, down the list, we find roof pitch, and further down, size of the attic. I feel that an attic would have to be quite tall for thermal buoyancy to begin to affect the airflow rate.

We also found that plastic air chutes do not inhibit airflow as some suspect. We used them all the way up the roof and found good airflow concentrated on the underside of the sheathing.

JLC: *How do you protect against blowing snow and rain?*
Rose: The ideal location for soffit vents is as outboard as possible on the eaves (closest to the fascia). With the vents located there, any snow that happens to be blown into the soffit is more likely to wind up on the top side of the soffit panels and is less likely to soak the insulation, wall plate, and ceiling drywall.

Some areas of a roof are simply subject to strong positive pressures, and vents should not be located there. Under such pressures, precipitation will enter — whatever the design of the opening. The classic case is where a shed roof meets a taller vertical wall. I consider such a roof slope impossible to vent and better left unvented at the wall intersection.

A good rule of thumb is to install vents only in locations not subject to snow drift. There are changes afoot at BOCA along these lines.

The designers of ridge and soffit vents have shown great ingenuity in preventing snow intrusion, but there is currently no standard test to assess this. Inevitably, there will be some sacrifice in airflow to keep the snow out.

JLC: *Any general thoughts?*
Rose: On balance, the venting of roofs seems to be a good idea for the time being. Nevertheless, I hope that future research will also look at the feasibility of unvented attic spaces. These have a number of inherent advantages, including easier fire sprinkling and lower energy losses from ductwork.

edge will be ragged, but it won't affect installation or the final appearance. Most vents are black, except for Top Cat, which is gray, and Shinglevent II, which comes in black, brown, sand, gray, and charcoal.

Expect to pay between $1.50 and $2.50 per linear foot for most panel-type vents.

Cor-A-Vent

A ninth vent — Cor-A-Vent — is in its own category. It is made from plastic corrugations stacked up, stapled together, and cut into strips. The final product is a bit mushy, but it is also very versatile. It is one of the few vents we looked at, for example, that can easily be used to vent a roof where it meets an end wall. A knife is all you need to cut Cor-A-Vent.

Cor-A-Vent has no baffles or fiber mesh to keep out insects or water. According to the manufacturer, the openings in the honeycomb matrix are small enough to keep out blowing rain and snow, and we saw no leakage in our test installation. On one hillside site, however, we observed substantial leakage where strong downdrafts forced fine snow through the vent's openings.

Expect to pay between $2.75 and $3.50 per linear foot for Cor-A-Vent.

Which To Buy?

When all is said and done, there is not an enormous difference between any of the products. But we did form some definite opinions.

The roll-out vents are the easiest to work with, but appear to offer the least airflow because of their dense fibers. If you have questions about the integrity of your ceiling vapor barrier and are relying heavily on passive attic ventilation, these wouldn't be our first choice.

Cor-A-Vent can probably provide more airflow, but we question how well it actually ventilates the attic. With a breeze blowing perpendicular to the ridge, we witnessed a smoke stream blowing in one side and out the other, not contributing to attic ventilation. This is a potential problem with all unbaffled vents. In addition, we're concerned about the potential for fine windblown snow to enter the vent and wet the attic insulation.

Overall, we prefer the panel-type vents that have an external baffle to direct wind over the top of the ridge and alignment tabs to speed installation. Among those we looked at, the Shingle-Over Ridge Vent appears to have the most durable construction. While the Ridge Master has internal rather than external baffles, the Hipmaster version gets high marks because it can be used on a hip, which is otherwise a tricky spot to vent. And the choice of five colors offered by the Shinglevent II is a point in its favor, despite the lack of alignment tabs. ■

Sal Alfano and Clayton DeKorne are associate editors of The Journal of Light Construction.