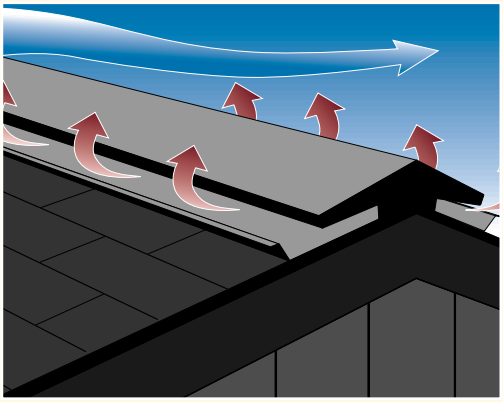
# Ridge Vent Airflow Performance Tests

*Conducted at the University of Illinois*



## Important Test Results Enclosed

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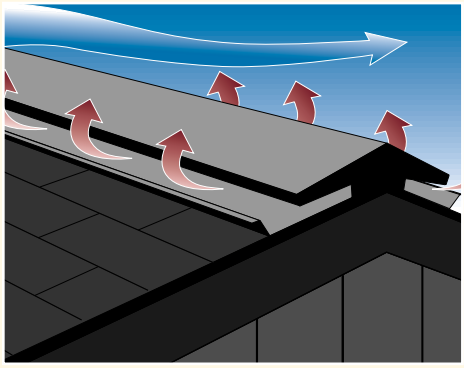


## How a ridge vent works

- A ridge vent is installed over a slot cut at the ridge of the roof.
- Proper ventilation occurs through two kinds of air movement:
  1. Warm air rises in the attic and expels air at the highest point in the roof.
  2. Wind passes over the ridge and creates negative pressure which pulls air and moisture out of the attic.
- An external baffle directs the airflow up and over the vent, creating an area of negative pressure. This pressure pulls air out of the attic through the vent. The baffle also provides protection against the infiltration of rain and snow.

## *Background: The Principles of Effective Roof Ventilation*

From earliest times, building designers have used the principle of "warm air rising" to ventilate their structures. Today, the most advanced systems incorporate roof ridge vent systems to ventilate the top of a structure.

The modern ridge vent system, when properly designed, utilizes ***two*** natural forces — "warm air rising" and "negative air pressure" at the ridge created whenever the slightest breeze is deflected upward by the ridge vent's external baffle. A balanced ridge vent system provides airflow in the attic to help reduce heat build-up, remove excess moisture, and keep the roof deck at an acceptable temperature.

Since the advent of roof ridge vents, a variety of sizes, shapes and configurations have emerged in the industry. These have included molded plastic, aluminum, rolled and corrugated. A great deal of controversy has arisen over the effectiveness of these different ridge vent systems.

In an ongoing effort to understand the dynamics of different styles of ridge vents, Air Vent commissioned a series of tests through the Agricultural Engineering Bioenvironmental and Structural Systems (BESS) Laboratory at the University of Illinois to compare the performance of different style ridge vents, under different wind conditions.

The following charts and drawings explain the procedures and findings of these laboratory tests.

## Test Highlights

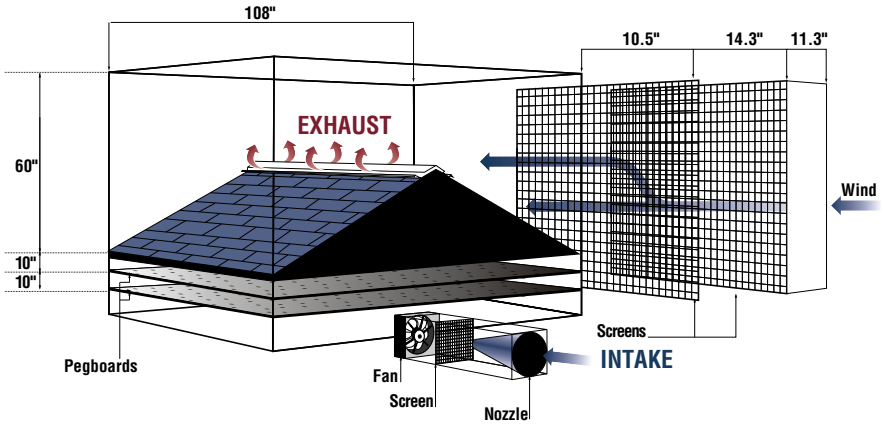
- Multi-Pitch FilterVent® and ShingleVent® II (which feature external baffles) outperformed other ridge vent products.
- The external baffle was the most significant contributor to the performance of the ridge vent. Rigid, molded ridge vents with external baffles performed better than other styles of ridge vents.
- The rolled and corrugated style ridge vents tested were unable to create the negative pressure necessary to pull air from the attic. And as winds increased, these ridge vents actually ingested air into the attic.
- At 15 MPH winds, there was no measurable airflow out of the attic for Roll Vent®, Cobra Vent™, Coravent® and VentSure® products.

## *Ridge Vents Tested*

The following commercially available ridge vents were tested:

1. Multi-Pitch FilterVent® – 1.5" slot
2. ShingleVent® II – 1.5" slot
3. Roll Vent® – 3.625" slot
4. Cobra Vent™ – 2.0" slot
5. Coravent® – 1.75" slot
6. VentSure® – 3.5" slot

All products were installed according to manufacturers' specifications. A specially designed wind tunnel was used to generate wind velocities from 5 to 15 mph. A second wind tunnel was used to simulate intake ventilation through soffits. **Complete test set-up and procedure details are on the back page.**




*The laboratory tests measured the effectiveness of different ridge ventilation systems. Wind was blown over the roof, then airflow out of the ridge was measured in cubic feet per minute of airflow (CFM). A smaller airflow chamber delivered air into the attic to simulate intake venting. At all wind speeds tested, Multi-Pitch FilterVent and ShingleVent II outperformed other ridge vent products.*

## *Results: Ridge Vents with External Baffles Outperform Other Systems*

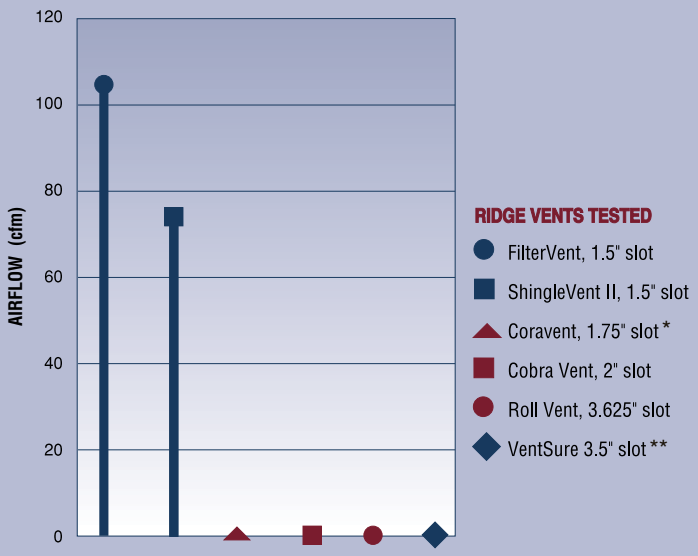
The results of the tests are listed in the two graphs below.

No airflow could be measured at any of the wind speeds for the Roll Vent, Cobra Vent, Coravent and VentSure. In fact, a slight positive pressure was measured for these vents, indicating that air was actually being blown into the attic through the ridge vent. This reading is the static pressure differential measured across the vent. The reading actually increased as wind increased. Therefore, as winds increase, more air and potentially rain and snow are being ingested into the attic.

## *Conclusions*

The most significant predictor of ridge vent performance was the external baffle or lack of baffle on the ridge vent. The ridge vents without baffles were unable to create a negative pressure in the attic space and thus were unable to create an airflow from the attic exhausting through the ridge vent.

### RIDGE VENT AIRFLOW COMPARISONS 15 MPH WIND

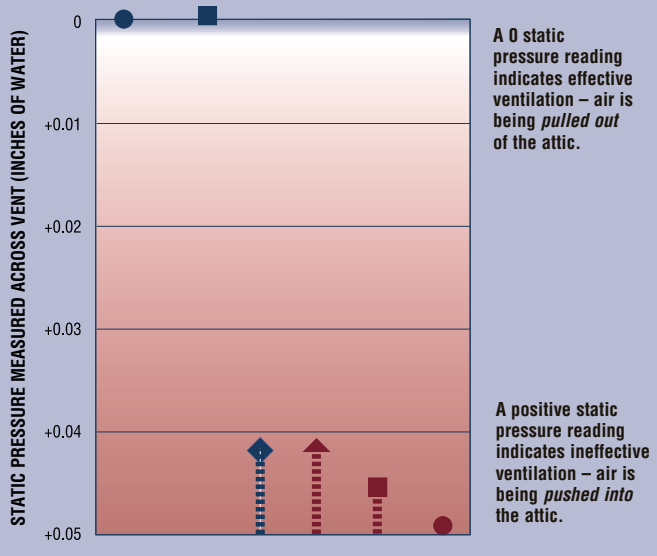



*A 0 reading indicates no airflow out of the attic.*

* Note: An optional Weather Shield is available from COR-A-VENT, Inc. for Coravent. COR-A-VENT recommends Weather Shield under the following conditions: if infiltration develops or is likely to develop, to compensate for structural barriers or where recurring extreme weather conditions exist.

** Note: An optional wind baffle is available from Owens Corning for VentSure. Owens Corning recommends the wind baffle in high wind areas or where required by code.

### STATIC PRESSURE ACROSS VENT 15 MPH WIND




*Airflow readings were attempted at 0 static pressure for each vent, representing an ideally balanced system. This balance could not be achieved for some vents as reflected in the static positive pressure readings shown in the chart above.*

## *Test Set-Up*

Three different style ridge vents were tested:

1) Molded ridge vents — Including ShingleVent II, a molded plastic shingle-over product, and Multi-Pitch FilterVent, a roll-formed aluminum ridge vent.
2) Rolled ridge vents — Including Roll Vent, Cobra Vent and VentSure; these unbaffled vents are made out of a mesh material or plastic corrugated product which is rolled out over the ridge and nailed to the peak of the roof.
3) Corrugated ridge vents — Including Coravent; these vents are made out of a plastic corrugated product and do not include baffles.

Slots were cut and ridge vents were installed in accordance with the manufacturers' instructions.

## *Test Procedures*

- A specially designed wind tunnel (see Figure 1) was attached to the BESS Laboratory fan test chamber to generate wind velocities from 5 to 15 mph over a roof section.
- The roof section was 48" wide with a 4/12 slope and oriented so that the wind flowed perpendicular to the ridge.
- The roof was shingled with asphalt shingles on the windward side of the roof and the top section of the leeward roof portion.
- The ridge slot was varied from 3.625" to 1.5" depending on the ridge vent manufacturers' recommendations. No ridge board was used.
- Each ridge vent was tested at four wind speeds: 5, 8, 11 and 15 mph.
- To simulate intake ventilation through soffit vents, a smaller airflow measurement chamber was attached to the wind tunnel to deliver air to the attic of the roof mock-up. This airflow chamber precisely measures airflow (+/-2%) delivered to the attic.
- Airflow was measured coming out of the ridge in CFM — cubic feet per minute of airflow.
- Airflow was measured at 0" water column static pressure. This simulates an ideally balanced system of intake and exhaust area.
- A static pressure of 0" water column represents ideal intake venting which has no resistance to airflow.
- Depending on the ridge vent, the static pressure that could be created in the attic varied.
- Both the BESS Laboratory fan test chamber and the smaller airflow chamber are designed according to the ASHRAE 51-1985/AMCA 210-85 standard.
- Attic static pressure was measured with a Dwyer 1430 Micromanometer accurate to +/- 0.001" Water Column.

### *Proven Performance Through Research*

Air Vent, Inc., is dedicated to improving the performance of ridge ventilation products through the research, development and testing of our products. We're also dedicated to sharing this information with the marketplace to help building professionals improve their knowledge and understanding of how to specify a ventilation system.

The testing presented in this brochure is just one example of many tests that have been performed in the development of our ridge vent products. As we look to the future, we will continue our efforts toward the advancement of ventilation technology.

***For more information on Air Vent ventilation products, call 800-AIR-VENT.***

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