Letters

Battle of the Ridge Vents

To the Editor:

In the article "Insulation and Ventilation: One Architect's Approach" (*NEB*, 8/86), the author states that the roof-venting problem has been solved by a product called "Cor-A-Vent."

Two tests, however, throw a different light on this product, and might dampen his enthusiasm. One test, conducted by American Filter Co. in Louisville, Ky., found that Cor-A-Vent offered up to 2½ times the resistance to airflow of standard metal ridge vents (when tested at 12 mph of airflow). Good airflow is very important in winter when cold-climate houses need ventilation to remove moisture and prevent ice dams.

The other test, conducted by Construction Research Laboratory, in Miami, Fla., showed very high water penetration with Cor-A-Vent at 50 mph airflows. At this wind speed, 1½ quarts of water were collected in five minutes through a section four feet long. By contrast, four-foot-long sections of metal ridge vents with baffles leaked only 1.2 ounces of water at 100 mph air speed.

Although I agree that aluminum ridge vents are not a source of aesthetic pleasure, they are not the only solution. For example, I have designed a number of ridge vents using split ridge vents, such as Air Vent, Inc.'s "Uni-Utility Vent." The result is a custom vent covered with the roof material but functioning properly as a baffled ridge vent.

Early ridge vents without baffles were plagued with leaks. But studies of later ridge vents with baffles added to keep rain and snow out revealed another interesting effect. By deflecting the wind over the ridge vent, the baffle ensures that the negative pressure at the ridge is never interrupted. In fact, it is encouraged due to the Bernoulli effect—keeping a constant flow of air from soffit to ridge.

Finally, Chapter 14 of ASHRAE's Fundamentals Handbook tells us that on roofs steeper than 4 in 12, the wind attaches itself to the roof. Thus, on steep roofs, vents without baffles are more prone to water and snow leaks.

Henri de Marne
Waitsfield, Vt.

Asked about the charges in a phone call, the owner of Cor-A-Vent, Gary Sells, told New England Builder *that in 16 years of use in the field, he has had only two complaints of leakage, and that in both cases, the lower "balancing vents" at the soffit were undersized—contradicting all of Cor-A-Vent's literature.*

Sells acknowledges that the cores in Cor-A-Vent offer some resistance to airflow (amount unknown), but that it is precisely this resistance that keeps out rain and snow. In snowstorms, he says, the vents will clog, but they will reopen on the first warm day. The ridge, he says is usually the first part of the roof to melt.

Also, Sells notes, competing metal ridge vents with filters to keep out rain and snow also have increased resistance. These, he says, would make a fairer comparison to his product.

As for the water tests, Sells *tells us that the researchers failed to install the balancing soffit vents, and that is why excessive leakage occurred.*

And regarding the beneficial air-pressure effects of baffles, Sells contends that having one-half of the vent under positive pressure is not a problem, since the Bernoulli effect caused under the vent adds suction to the other side, increasing the vent action.

So far, he says, the only proof he has is in the pudding—on the roofs, that is. But Sells has engaged the services of engineers at a local university and at a national testing laboratory to develop hard numbers, which he believes will back up his claims. Because of the need to develop appropriate testing procedures, he says, the results will not be available anytime soon.

Finally, bear in mind that the tests cited by de Marne were commissioned by manufacturers of metal vents that compete with Cor-A-Vent. How well they predict actual performance in the field is a matter of conjecture.—Ed.

Innovative Duct Heaters

To the Editor:

One truly innovative development in residential space heating is the accurate control of electric current, through resistance elements in order to exactly match the heat loss from the conditioned space.

The article by Jon Eakes, "The Silicon-Controlled Rectifier" (August 1986), elicits some comments and raises several questions.

The electronic control he describes sounds like a repackaged version of Intertherm's "Power Pulse" time-proportioning thermostat. The temperature sensor is a thermistor incorporated into an electronic circuit which samples the temperature as often as once every three seconds. When the circuitry calls for heat, a silicon-controlled rectifier (SCR) is turned on to allow a flow of electric current to the heater element, thus adjusting the effective power of the heater to closely match the heat loss.

While this technique could potentially provide a very well-controlled system, its application to duct heaters as illustrated raises some technical questions:

1. There was no mention of minimum airflow requirements of the duct heaters. If the airflow is not adequate, the heater element may overheat. Of course, a temperature-limit switch would be incorporated as a safety device, but air temperatures and velocities may be quite high for a 2,000-watt heater in a six-inch duct at DHL [design heat loss]. This could have a negative impact on occupant comfort.

2. The article indicates the temperature sensor is located in the heater package downstream of the heater element. I would think the temperature-sensing element (thermistor) should be located in the conditioned space like a normal room thermostat. The electronic switch could be located in the duct as an option, but should be located in the "cool" upstream airflow.

While not specifically mentioned in the article, I assume one proposed application for the duct-heater concept is in the supply-air duct(s) from an air-to-air heat exchanger operating in the continuous-ventilation mode. In this mode they would also make up for heat lost through the heat exchanger. Depending on the system's design, air velocities to individual registers might be as low as 10 to 15 cfm. The variability in heater operating conditions could be a barrier to obtaining safety listing.

Another variation, and perhaps improvement, would be to use a liquid-filled heat exchanger to increase the thermal mass of the heater. This would possibly decrease the surface temperature of the heater, eliminating scorched-dust odors, and possible overheating.

Martin E. Thompson
Extension Energy Agent
Oregon State University
Eugene, Ore.

Thermax in Interior Applications

To the Editor:

I'd like to respond to the assertion in the August issue in "Insulation & Ventilation: One Architect's Approach" that "Thermax insulation board can be left exposed on interior applications." I've always understood that flammable foam boards such as Thermax require a fire-resistant covering such as gypsum board when installed on the interior. Even if that were not the case you would still want to cover it for aesthetic and mechanical reasons, as the foil face on the Thermax doesn't make much of an interior finish material.

Paul Hanke
Plainfield, Vt.

Gordon Tully responds:

Thermax is classified as a foam plastic, and so is subject to the code regulation that it be separated from the interior of a residence by a 15-minute fire barrier, such as a ½-inch gypsum board. It cannot and should not be used exposed to the interior of a residence. Paul Hanke is absolutely correct.

What I meant to question was whether it is advisable to use a foam plastic in a detail that leaves a void between the face of the plastic and the protective layer of gyp board. The board, in my loose definition of the word, would then be "exposed" to the air, even if concealed from the room.

Thermax has an Underwriter's label, and so appears to be better than most foam boards with regard to its flame-spread and smoke-developed ratings. (Read their literature and see why it is so easy to think it is approved for exposed applications.)

However, Foamular (and presumably other extruded polystyrenes) claims to have a lower flame-spread rating than Thermax, although Thermax claims to have a lower smoke-developed rating than the other polyisocyanurate boards.

As a result of reinvestigating this matter, I am reluctant to use any board *in a situation where it was not covered* directly *by gypsum board. For example, I would hesitate to place strapping between a foil-faced board and foil-backed gyp board, leaving a void space. However, I have no case studies to back up this restriction, and would welcome comments on this.*

Thermax still is the only foam insulation that I know of that provides a good vapor barrier—in fact, twice as good as six-mil poly. Most of the others, including Tuff-R (also made by Celotex), seem to have a perm rating of around one, similar to plywood.

Since I wrote the article, I woke up to the fact that the Freon used in urethane insulation contributes substantially to the growing problem of atmospheric ozone depletion, since it ultimately is released into the environment. So I have stopped using all forms of urethane (except crack filler).

When I use interior foam insulation, it is extruded polystyrene combined with a vapor/air barrier. To protect the barrier, I put it on the cold side of the foam during construction; I use R-19 fiberglass batts outside of the barrier. I wouldn't have done this several years ago, before we learned that locating vapor barriers on the warm side is not that crucial. I again welcome any comments on this matter.

Keep 'em coming.... We welcome letters, but they must be signed and include the writer's address. *New England Builder* reserves the right to edit for grammar, length and clarity. Mail letters to *NEB*, P.O. Box 5059, Burlington, Vt. 05402.