

QUESTIONS & ANSWERS

Low-E Shades

Q: Please evaluate the effectiveness of Pella windows with Type-E Slimshades for passive solar heating.—*Jim Chambers, Sunbuilders Inc., Fort Wayne, Ind.*

A: With the shades closed, Pella gives the window an R-4.35. This compares favorably with double glazing at R-2 and triple glazing at R-3. Although this is lower than the R-values claimed for many night insulation systems, there is no problem with loose edge seals—often a weak point with movable insulation. As with any night insulation, it must be used to be effective. Slimshades have the advantage of being easy to operate.

How about the blocking of solar gain? Even when fully open, the shades intercept and reflect some sunlight you're trying to capture. And unfortunately no one seems to know just what that shading effect is. Glenn Chafee, director of R&D at Pella, says there are so many variables involved that the company has not tried to measure the shading. Several other research centers around the country echoed this view, though one expert ventured an estimate of a 50-percent reduction. This would make the solar transmission roughly equal to that of low-e double glazing. Between-the-glass shades offer convenient night insulation and summer shading but, so far, an unknown amount of shading.

Crawlspace Barrier Placement

Q: If you place a vapor barrier on the warm side of the insulation between a heated area and an unheated crawlspace, will moisture from the crawlspace migrate into the insulation and condense? In the winter, when the house is hot and dry, it seems the vapor barrier should be on the cold side of the insulation.—*John Mascaro, Mascaro Construction, Philadelphia*

A: Moisture migration and relative humidity remain two of the least-understood topics builders face. First, remember that moisture moves from a point of high vapor pressure to a point of low vapor pressure. Since warm air holds more moisture than cold air, warmer air generally has the higher vapor pressure. For example, air at 68°F at or above 33-percent RH will have a higher vapor pressure than crawlspace air at 40°F and 90-percent RH, and moisture will tend to move, if at all, from the house to the crawlspace. Using a cold-side vapor barrier would almost guarantee condensation in the insulation in the winter.

In the summer, however, particularly in air-conditioned homes, moisture may be driven from the crawlspace into the house. Although you could stop this by using a vapor barrier below the floor insulation, it's more practical to keep the crawlspace RH level down. This is best done with a polyethylene ground cover.

Much of the moisture transport from crawlspace to house is due to the stack effect pulling air up through the house. The best way to prevent this is to seal off all links between the crawlspace and the house. A good ground cover in the crawlspace will keep the RH of any air that does enter the house reasonably low.

Carport Conversion

Q: I plan to convert a carport to a greenhouse/dining room. The brick wall between the carport and house contains a door to the kitchen and a window to the living room. How should the greenhouse be ventilated and how should it be connected to the house for effective heating?—*Michael Moran, Clemson, S.C.*

A: The brick wall has the makings of a Trombe wall, with one minor hitch—if it doesn't receive direct sunlight, its value as thermal mass is greatly reduced. Cutting skylights into the carport roof would help the mass work better by allowing sunlight to strike it directly.

To get proper air circulation from the sunspace to the house you'll need two vents—one high and one low. The doorway and window should provide this, though a high vent can be added if required. Since natural convection is relatively weak in a one-story space, a thermostatically controlled fan in the wall would give greater control and move even more heat into the house.

For summer ventilation, high and low vents to the outdoors usually suffice. A doorway at one end combined with a high vent at the other end is a common setup. Another solution combines awning windows along the front with operable skylights for roof vents. For accurate sizing of openings for venting and heating, see "The Last Word in Sunspace Design," *Solar Age*, 6/84.

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