QUESTIONS & ANSWERS

Beating Sunspace Glare

Q: A building we own and occupy has a three-story atrium/sunspace with over 30 2x5-foot windows. Our computer room faces the atrium and users complain about the glare. We are considering installing shades or films to control the glare. What strategies are most promising?—*Lou Nemesec, Illinois Industrial Commission, Chicago*

A: Glare can interfere with vision and cause discomfort and eye fatigue. There are two kinds of glare: direct and indirect. Direct glare is caused by light coming directly into the eye from the source. Indirect glare is caused by reflected light. You can control glare by reducing the brightness or size of the source, changing its position, or making the area around the source brighter.

We assume that the complaints about glare come from long exposure, since short-term glare can usually be tolerated. We also assume that you can't rearrange the building or the room to change the relationship between source, work surface, and worker. The size of the source too is fixed, unless you block out some of the entering light with an opaque material.

You could reduce the contrast between the incoming light and the surrounding surfaces by increasing the lighting level on the interior surfaces with electric lighting. But it seems that your best bet is limiting the brightness of the source.

If you need help year-round, use window films. They can cut out anywhere from 45 to 86 percent of the incoming light. If view is not important, permanent louvers may do.

If you want seasonal control, use movable or removable shades or blinds. Interior choices include vertical or horizontal blinds. Exterior choices include woven fiberglass shades or aluminum mini-louvers. For names and specifications of movable shading products, see "Sunspace Heat Blockers," Solar Age, 5/85.

Warped PVC Windows

Q: I've heard some horror stories about shrinkage and warpage in extruded PVC (polyvinyl chloride) windows. Can you get some factual information on this?—*Roy Berger, Architect Roy Berger and Sun, Des Moines, Iowa*

A: Problems can be due to manufacturing or installation procedures, window color, or climate.

According to veteran plastic window maker Dan McCleary of Rehau Plastics, Leesburg, Va., PVC units with welded corners can resist the stresses of thermal expansion better than those screwed together with a metal bracket. The holes punched out for hardware or mounting screws are another weak point—if they are too small or badly punched, cracks can occur.

Warpage can be controlled by embedding a steel or aluminum bar in the frame, although this is limited by the size of the frame. Many of the modern windows have a very narrow sight-line—the amount that the window frame extends into the rough opening—which limits the size of metal bar that can be installed.

Color is another factor in the expansion problem. White or beige vinyl expands less than dark-colored vinyl because it absorbs less solar radiation. According to McCleary, this is not a problem north of the 50th parallel—in Canada and most of Europe. Some manufacturers use white vinyl for the window core, and add a thin overlay of pigmented vinyl that can move around without damaging the window.

Expansion and contraction problems will be worse if the windows do not have room to expand and contract. Shims and setting screws should be installed at least 8 inches back from the corners to avoid this.

Low-E vs. Quad Glazing

Q: A window salesperson suggested to me that triple glazing with low-emissivity (low-e) glass would be better than quad glazing (two layers of glass surrounding two layers of 3M Sungain film) for sunspace windows. He maintained that the low-e unit would make the room feel warmer because it would reflect the long-wave radiation back into the room. Which product would be better for this application?—*Roger Saunders, Hollis, N.H.*

A: The answer depends on the type of room and its use, according to H. J. Koester of Weather Shield, which makes both types of glazing. If the sunspace is a direct extension of the living area and comfortable sitting conditions are of greater importance than solar gain, he suggests the low-e would be a better value due to its higher R-value and lower cost.

For a heat-producing sunspace, he says the quad with Sungain would be better, because of its higher solar transmittance and small sacrifice in R-value. Weather Shield's triple low-e glass has a solar transmittance of 0.52 to 0.55 and an R-value of 4.34 (for the 1½-inch unit). For quad, the transmittance is 0.63 and the R-value is 3.85. While the quad is a better solar performer, it is also more expensive by 10 to 20 percent. As in all glazing decisions, it boils down to a series of trade-offs.

Weather Shield's low-e glass is the *hard-coat* type, imported from Belgium. Its performance measures may not apply to comparable U.S.-made glass.