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Lighting Tips from the Pros

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By Barbara Erwine, Daylighting Specialist Lighting Design Lab, Seattle, WA

Luminance ratios are key. Luminance ratios and surface brightness are very important, more than specific guidelines on how many square feet of glass you need or how many foot-candles are reaching the worksurface. It is important to make sure that the interior environment shapes, colors and balances the light once it has entered an aperture such as a window or skylight.

Avoid compromising components. Compromising components of a daylighting system may cause the whole system to fall apart. In one situation, an interior light shelf was reduced in size without regard to light penetration. When October came around, the direct sun was entering unimpeded into the area. Also, the light shelf was not distributing light into the area, making the installed photocells useless. They basically wasted the money on the system, and they got a lot of complaints from occupants.

Be careful with stepping dimmers. "Switching" or step-down dimming systems are not always appropriate. The only times I've seen these work in an office environment is when there are high ceilings and the lighting is indirect. Continuous dimming is a little more expensive but much more accepted by the workforce.

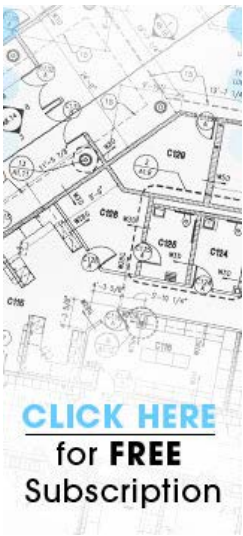
Keep expectations reasonable. Don't expect "research level" results from your photocells. Going for the optimum performance of a photocell can mean a lot of fiddling and questions about placement. If you go for 70 percent savings, you're going to be doing a lot of tweaking. If you go for a lower level of savings, you still save energy and get great benefits, but the system is much simpler. Lockheed has a building that uses dimming, and although they are not reaching the values they predicted, they are still getting wonderful savings.

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Learn from your neighbors. Daylighting is an extremely regional issue. When examining case-studies, try to focus on buildings in your own region.

Know your low-e. There is a very low understanding of the difference in the two types of low-e glass available. One accepts direct solar gain and one greatly limits it. Time and time again architects specify a low-e product and don't designate which one.

By Hayden McKay Principal Hayden McKay Lighting Design, New York, NY

Know daylighting's worth. In terms of philosophy, the biggest mistake made is trying to use daylight as task lighting. It is only appropriate for ambient lighting.

Don't forget the dimming. Daylighting only saves energy if you control electric lighting. As strange as it may sound, a lot of people forget this.

Don't obscure the view. Diffusing or obscuring glass generally isn't appropriate as a complete solution in a daylighting strategy because it breaks the connection with the outdoors. The reason most employees want daylighting is for the view, not for the light. Also, diffusing glass can be a huge source of glare.

Use roof monitors. Roof monitors are very effective, much more than skylights. Lighting a sloped ceiling is also very effective. A skylight becomes like a light source and can send strong patterns on the floor, while monitors use reflected light and spread it over a wider area. Hence, they are easier to control.

Northern exposure. It's a misconception that the sun doesn't come through north windows. In some latitudes you have to control north-facing windows from summer sun. South facing windows are easy to control with overhangs. East and west exposure are hard to control. West facades are the worst, because exposure is happening during the overheated part of day, where you already have thermal problems with outdoor temperatures. Vertical blinds are best.

Control sun before it hits the window, not after. Fins and overhangs are preferable to interior window treatment. The new low-e glass has made a big difference in daylighting, too. It provides the same amount of visual transmission, but you can reduce the shading coefficient by half. Also, 100 percent clear glass isn't always necessary. You can go with a lower visual transmission to balance glare with interior lighting.

Photocells. Avoid placing photocells where individual actions will greatly affect the entire system (if someone opens or closes their blinds). There is no exact solution to locating photocells - there are problems and compromises wherever you locate them. We use diffusing photocells to balance indirect light from daylight and electric light.

No direct exposure. Never have direct sunlight hit the work surface of a fixed employee. Direct light is only appropriate in places like libraries where people can choose where to sit (some like to sit in blinding sunlight just for the joy of it!).

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