



Gaining Technical Credentials for Residential Daylighting

BY KEN BRENDEN

Daylighting, well-established as a bona fide green building option and quantifiable energy saver, is attracting the attention of not just commercial fenestration manufacturers, researchers, designers and codes and standards groups, but also that of residential designers, builders and savvy homebuyers.

Daylighting is an energy-saving measure that reduces the energy demand for electric lighting and the heat load that electric lighting places on air conditioning systems. Additionally, studies comparing buildings with optimized daylighting systems to those without come to the same conclusions: people simply function better in a daylit environment.

The Codes

Recognition of all of these positive effects is dawning in official quarters within proliferating green rating systems, standards and model codes. While most of these target the commercial sector, recent developments affecting residential construction are of note.

New green residential building and remodeling guidelines in the NGBS adopted early in 2009 emphasize natural lighting. Two points are awarded for the use of tubular daylighting devices (TDDs) or low-E insulating glass skylights in rooms without windows (Section 704.2.4). Section 701.4.4 requires windows, exterior doors, skylights and TDDs to have NFRC-certified U-factors and solar heat gain coefficients (SHGCs) in accordance with ENERGY STAR® or equivalent.

Last October, the model code was revised for 2012 to theoretically achieve energy savings of 30 percent relative to the 2006 version. The approved changes include all aspects of residential (IECC Chapter 4) construction, laying a strong foundation for residential efficiency

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gains. The energy chapter of the International Residential Code (IRC Chapter 11) was essentially eliminated and now references the IECC as a single nationwide uniform energy code for both residential and commercial buildings.

Daylighting Ratings on the Way?

The National Fenestration Rating Council (NFRC) has announced that it may rate windows for daylighting. A task group was formed at the NFRC's November 2010 meeting and is scheduled to come back with a recommendation in early 2011.

The design community is becoming more knowledgeable in the techniques available for enhancing daylighting.

Devices besides windows serve the goal of bringing diffuse natural light to interior spaces. Judicious use of skylights introduces daylight throughout the interior rather than just around the perimeter. The newer TDDs are increasingly popular for interior areas such as bathrooms, hallways and kitchens that receive limited daylight and as noted are specifically recommend-

ed for windowless rooms in ANSI/ICC/NAHB-700.

In addition to adding pathways for light to enter, design strategies can enhance the availability of natural light. For instance, allowing light to penetrate high into a space through the use of clerestories, light shelves and vertical baffles projects it deeper into a room, as does sloping ceilings away from windows and using high-reflectance paint.

Incorporating automatic daylighting controls with these products provides ideal energy savings by controlling the amount of heat gain based on the sun's orientation to the building.

While these techniques and their benefits are widely acknowledged, the growing requirement for daylighting in green standards and codes points to a need for better defined daylight performance analysis methodology and quantifiable metrics.

Over time, evaluation techniques, performance metrics and rating systems will evolve, and will likely feed continued code development. The wise residential architect and builder, and the alert fenestration product manufacturer, will get ahead of the curve in quantifying daylighting benefits for code officials and promoting them to homeowners. ■

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