GEW72-14
605.1.1.1

Proponent: Brenda Thompson, Chair, representing Sustainability, Energy, and High Performance Code Action Committee (SEHPCAC@iccsafe.org)

Revise as follows:

605.1.1.1 ~~Permanent~~ Shading devices for fenestration. Vertical fenestration within 45 degrees (785 rad) of the nearest west, south, and east cardinal ordinate shall be shaded by one or a combination of the following methods:

1. Permanent horizontal exterior projections with a projection factor greater than or equal to 0.25. Where different windows or glass doors have different projection factor values, each shall be evaluated separately, or an area-weighted projection factor value shall be calculated and used for all windows and glass doors. Horizontal projections shall extend laterally beyond the edge of the glazing not less than one-half of the height of the glazing, except at building corners.

2. Automatically controlled shading devices capable of modulating in multiple steps the amount of solar gain and light transmitted into the space in response to daylight levels or solar intensity, that comply with all of the following:

   2.1. Exterior shading devices in the closed position shall cover not less than 90 percent of the fenestration.

   2.2. Interior shading devices in the closed position shall cover not less than 90 percent of the fenestration and have a minimum solar reflectance of 0.50 for the surface facing the fenestration.

   2.3. A manual override, where provided, shall override operation of automatic controls no longer than 4 hours.

   2.4. Commissioning shall be conducted as required by Section 611.4 to verify automatic controls for shading devices respond to changes in illumination or radiation intensity.

Exception: Shading devices are not required for the following buildings and fenestrations:

1. Buildings located in hurricane-prone regions in accordance with Section 1609.2 of the *International Building Code* or on any other building with a mean roof height exceeding the height limits specified in Table 1504.8 of the *International Building Code* based on the exposure category and basic wind speed at the building site.
2. Where fenestration is located in a building wall that is within 18 inches (457 mm) of the lot line.
3. Where equivalent shading of the fenestration is provided by buildings, structures, geological formations, or permanent exterior projections that are not horizontal, as determined by sun angle studies at the peak solar altitude on the spring equinox, and three hours before and after the peak solar altitude on the spring equinox.
4. Where fenestration contains dynamic glazing that has a lower labeled solar heat gain coefficient (SHGC) equal to or less than 0.12, and the ratio of the higher and lower labeled visible transmittance (VT) is greater than or equal to 5. Dynamic glazing shall be automatically controlled to modulate, in multiple steps, the amount of solar gain and light transmitted into the space in response to daylight levels or solar intensity. Functional testing of the controls ~~shall be~~ of the dynamic glazing shall be conducted in accordance with Section 611.4. ~~C408.3.1 of the *International Energy Conservation Code*.~~

Reason: This proposal was submitted by the ICC Sustainability Energy and High Performance Code Action Committee (SEHPCAC). The SEHPCAC was established by the ICC Board of Directors to pursue opportunities to improve and enhance International Codes with regard to sustainability, energy and high performance as it relates to the built environment included, but not limited to, how these criteria relate to the International Green Construction Code (IgCC) and the International Energy Conservation Code (IECC). This includes both the technical aspects of the codes as well as the code content in terms of scope and application of referenced standards. In 2012 and 2013, the SEHPCAC has held six two-day open meetings and 50 workgroup calls, which included members of the SEHPCAC as well as any interested parties, to discuss and debate proposed changes and public comments. Related documentation and reports are posted on the SEHPCAC website at: http://www.iccsafe.org/cs/SEHPCAC/Pages/default.aspx.

This proposal adds automated shading systems (i.e. automatic window shading) as an alternative compliance option to fixed overhangs or louvers because they can save equal or more energy than the fixed overhangs. This is consistent with similar requirements in ASHRAE 189.1-2011 section 7.4.2.5 Permanent Projections.

Following is a summary of the advantages of automated shading systems vs. fixed overhangs taken from Lawrence Berkeley National Lab (LBNL). The full LBNL paper is attached separately.

1. Overhangs cannot be controlled once the design is complete and the system installed.
2. Overhangs will behave the same way in September as in March but March is typically still a heating season month whereas September is often still a severe cooling season month. Active dynamic glazing and shading systems can be operated to address these seasonal variations.
3. Dynamic systems (glazing/shading) can be operated to reject diffuse sky radiation as well as direct radiation.
4. Overhangs reduce useful daylight contributions when they should not, e.g. on overcast days, and during hours when the window is not in sunlight. Dynamic glazing and shading can be managed to be more transmissive when needed in order to admit daylight to reduce building lighting loads.

Cost Impact: Will increase the cost of construction. The proposal provides another option to provide shading for the glazing. The shutter systems may be more costly to install than other systems.

GEW72-14: 605.1.1.1#2-THOMPSON578