

GEW76-14

605.1.1.2 (New), Chapter 12

Proponent: Jonah Cecil Scheib, Urban Green Council, representing Urban Green Council (cs@urbangreencouncil.org)

Add new text as follows:

605.1.1.2 Maximum exterior building envelope heat transfer. The building thermal envelope shall have an average U-factor not greater than 0.20 Btu/hr-sf-°F. The average U-factor shall be calculated by averaging the U-factor of each included envelope component in accordance with Equation 6-xx:

Average U-factor = $U_{\text{ref}}/A_{\text{total}} = (UA_1 + UA_2 + \dots + UA_n) / A_{\text{total}}$ (Equation 6-xx)

In determining the average U-factor, the following shall apply:

1. The envelope shall include all above grade walls separating conditioned from non- conditioned space or from low energy spaces.
2. The roof shall be excluded from the determination.
3. Skylight area of the roof that exceeds that allowed by prescriptive compliance under this code shall be included in the determination.
4. $U_x A_x$ is the U-factor for each individual thermal envelope component multiplied by the total area of such component incorporated in the building thermal envelope.
5. A_{total} is the total area of the included elements of the thermal building envelope as described in this section.
6. The U-factor of a penetration of mechanical equipment through the building thermal envelope, where thermal performance data are not available, shall be assumed to be 0.5 Btu/hr-sf-°F.
7. The U-factor for each component shall be calculated by taking into account thermal bridging at metal studs and members, shelf angles, floor edges, projecting balconies, window frames, and other components passing through the thermal barrier. U-factors shall be determined using test results as required by this code, tabulations provided by this code, the methods of NFRC-100, or two-dimensional heat flow modeling or three- dimensional heat flow modeling.
8. Exposed slab edges shall be considered mass walls with a horizontal dimension equal to the horizontal dimension of the thicker of the adjacent exterior walls.

Add new standard as follows:

NFRC

100-2010 Procedure for Determining Fenestration Product U-Factors

Reason: Building envelope design has a major impact on both heat loss in winter and solar gain in summer. Using the flexibility in current energy codes, designers can meet energy- efficiency requirements by trading off the efficiency of mechanical and lighting equipment against the thermal integrity of the envelope. Since the building envelope will be in use for decades or more, this trade-off is short-sighted. By establishing fixed performance requirements for building envelopes which include real-world effects of exposed slab edges and mechanical wall penetrations with respect to heat loss, independent of mechanical and lighting equipment choices, the long-lived building envelope will at least meet certain minimum standard.

The NFRC 100 standard is already referenced in the 2012 IECC.

Bibliography:

Urban Green Council, Green Codes Task Force, Energy Fundamentals Proposal 3 ([Proposal](#))

Cost Impact: Will not increase the cost of construction.

Analysis: A review of the standard proposed for inclusion in the code, NRCC 100-2010, with regard to the ICC criteria for referenced standards (Section 3.6 of CP#28) will be posted on the ICC website on or before April 1, 2014.

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