

## EC40–09/10

### Table 402.1.1, Table 402.1.3, 402.3.6; IRC Table N1102.1, Table N1102.1.2, N1102.3.6

**Proponent:** Bill Prindle, ICF International, representing the Energy Efficient Codes Coalition; Jeff Harris, Alliance to Save Energy; Harry Misuriello, American Council for an Energy-Efficient Economy (ACEEE); Garrett Stone, Brickfield, Burchette, Ritts & Stone; Steve Rosenstock, Edison Electric Institute; Brian Dean, ICF International

**THIS IS A 2 PART CODE CHANGE. PART I WILL BE HEARD BY THE IECC COMMITTEE. PART II WILL BE HEARD BY THE IRC BUILDING/ENERGY COMMITTEE. SEE THE TENTATIVE HEARING ORDERS FOR THESE COMMITTEES.**

#### PART I – IECC

Revise as follows:

**TABLE 402.1.1  
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT<sup>a</sup>**

CLIMATE ZONE	FENESTRATION U-FACTOR <sup>b</sup>	SKYLIGHT <sup>b</sup> U-FACTOR	GLAZED FENESTRATION SHGC <sup>b, e</sup>	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE <sup>i</sup>	FLOOR R-VALUE	BASEMENT <sup>c</sup> WALL R-VALUE	SLAB <sup>d</sup> R-VALUE & DEPTH	CRAWL SPACE <sup>e</sup> WALL R-VALUE
1	1.2	0.75	0.30	30	13	3/4	13	0	0	0
2	0.65 <sup>j</sup>	0.75	0.30	30	13	4/6	13	0	0	0
3	0.50 <sup>j</sup>	0.65	0.30	30	13	5/8	19	5/13 <sup>f</sup>	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	20 or 13+5h	13/17	30 <sup>g</sup>	10/13	10, 2 ft	10/13
6	0.35	0.60	NR	49	20 or 13+5h	15/19	30 <sup>g</sup>	15/19	10, 4 ft	10/13
7 and 8	0.35	0.60	NR	49	21	19/21	38 <sup>g</sup>	15/19	10, 4 ft	10/13

b. The fenestration U factor column excludes skylights. The SHGC column applies to all glazed fenestration.

(Footnotes remain unchanged)

**TABLE 402.1.3  
EQUIVALENT U-FACTORS<sup>a</sup>**

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR <sup>b</sup>	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR <sup>d</sup>	CRAWL SPACE WALL U-FACTOR <sup>c</sup>
1	1.20	<del>0.75</del>	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	<del>0.75</del>	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	<del>0.65</del>	0.035	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	<del>0.60</del>	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	<del>0.60</del>	0.030	0.057	0.082	0.033	0.059	0.065
6	0.35	<del>0.60</del>	0.026	0.057	0.060	0.033	0.050	0.065
7 and 8	0.35	<del>0.60</del>	0.026	0.057	0.057	0.028	0.050	0.065

(Footnotes remain unchanged)

**402.3.6 Replacement fenestration.** Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit product shall meet the applicable requirements for U-factor and SHGC in Table 402.1.1. Where more than one unit is being replaced, an area-weighted average of the replacement fenestration products shall be permitted to satisfy the U-factor and SHGC requirements.

**Exception:** Replacement skylights shall be permitted to have a weighted average U-factor not to exceed 0.60 and an SHGC not to exceed the value prescribed in Table 402.1.1.

**PART II – IRC BUILDING/ENERGY**

Revise as follows:

**TABLE N1102.1  
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT<sup>a</sup>**

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT <sup>b</sup> U-FACTOR	GLAZED FENESTRATION SHGC	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE <sup>k</sup>	FLOOR R-VALUE	BASEMENT <sup>c</sup> WALL R-VALUE	SLAB <sup>d</sup> R-VALUE AND DEPTH	CRAWL SPACE <sup>e</sup> WALL R-VALUE
1	1.2	<del>0.75</del>	0.35 <sup>j</sup>	30	13	3/4	13	0	0	0
2	0.65 <sup>i</sup>	<del>0.75</del>	0.35 <sup>j</sup>	30	13	4/6	13	0	0	0
3	0.50 <sup>l</sup>	<del>0.65</del>	0.35e, <sup>j</sup>	30	13	5/8	19	5/13f	0	5/13
4 except Marine	0.35	<del>0.60</del>	NR	38	13	5/10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	<del>0.60</del>	NR	38	20 or 13 + 5h	13/17	30f	10/13	10, 2 ft	10/13
6	0.35	<del>0.60</del>	NR	49	20 or 13 + 5h	15/19	30g	10/13	10, 4 ft	10/13
7 and 8	0.35	<del>0.60</del>	NR	49	21	19/21	30g	10/13	10, 4 ft	10/13

b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

(Footnotes remain unchanged)

**TABLE N1102.1.2  
EQUIVALENT U-FACTORS<sup>a</sup>**

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL U-FACTOR	MASS WALL U-FACTOR <sup>b</sup>	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
1	1.20	<del>0.75</del>	0.035	0.082	0.197	0.064	0.360	0.477
2	0.65	<del>0.75</del>	0.035	0.082	0.165	0.064	0.360	0.477
3	0.50	<del>0.65</del>	0.035	0.082	0.141	0.047	0.091c	0.136
4 except Marine	0.35	<del>0.60</del>	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	<del>0.60</del>	0.030	0.060	0.082	0.033	0.059	0.065
6	0.35	<del>0.60</del>	0.026	0.060	0.060	0.033	0.059	0.065
7 and 8	0.35	<del>0.60</del>	0.026	0.057	0.057	0.033	0.059	0.065

(Footnotes remain unchanged)

**N1102.3.6 Replacement Fenestration.** Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit product shall meet the applicable requirements for U-factor and solar heat gain coefficient (SHGC) in Table N1102.1. Where more than one unit is being replaced, an area-weighted average of the replacement fenestration products shall be permitted to satisfy the U-factor and SHGC requirements.

**Exception:** Replacement skylights shall be permitted to have a weighted average U-factor not to exceed 0.60 and an SHGC not to exceed the value prescribed in Table N1102.1.

**Reason:** This proposal increases energy efficiency by eliminating separate specific skylight requirements in new construction and requiring that skylights meet overall fenestration U-factors on a weighted average basis. Since vertical fenestration maximum U-factors are lower than skylights maximum U-factors in all climate zones (except zone 1), this proposal will serve to produce energy savings in all homes built with skylights. Given that skylights (with R-values often less than R-2) occupy space that would otherwise be filled by a R-30 or R-49 roof, it is important that as much efficiency be captured as possible.

While skylights generally may not meet more stringent vertical fenestration U-factors on an individual unit basis, this is not a problem because the fenestration U-factor requirements can be satisfied on a weighted average basis. As a result, less stringent skylights will be offset by more stringent vertical fenestration. Since there are no limits on fenestration (including skylights) in the prescriptive path, this improvement will serve to ensure that the actual overall fenestration U-factor, including skylights, is lower under the prescriptive path. To illustrate, to meet a 0.35 U-factor fenestration requirement, the builder could install 40 square feet of skylights at a 0.60 U-factor and 360 square feet of vertical fenestration at a 0.32 U-factor. The resulting weighted average U-factor would be 0.348, thereby satisfying a 0.35 U-factor.

The proposed revisions to the replacement fenestration section are also necessary so that replacement fenestration can qualify on a weighted average basis and to permit skylight replacement (since vertical fenestration may not be replaced when skylights are replaced, it is necessary to offer a separate standard in the exception for replacement skylights).

**Cost Impact:** The code change proposal will increase the cost of construction.

**PART I – IECC**

Public Hearing: Committee: AS AM D  
 Assembly: ASF AMF DF

**PART II – IRC BUILDING/ENERGY**

Public Hearing: Committee: AS AM D  
 Assembly: ASF AMF DF

ICCFILENAME: PRINDLE-EC-9-T. 402.1.1-T. N1102.1