

ACM NI-2005

Appendix NI - Alternate Default Fenestration Thermal Properties

Scope

This appendix applies to fenestration excepted from Section 116 (a) 2 and Section 116 (a) 3 of the Standard.

“EXCEPTION to Section 116 (a) 2: *If the fenestration product is site-built fenestration in a building covered by the nonresidential standards with less than 10,000 square feet of site-built fenestration or is a skylight, the default U-factor may be the applicable U-factor as set forth in the Nonresidential ACM Manual.”*

“EXCEPTION to Section 116 (a) 3: *If the fenestration product is site-built fenestration in a building covered by the nonresidential standards with less than 10,000 square feet of site-built fenestration or is a skylight, the default SHGC may be calculated according to Equation 116-A.”*

Purpose

To present alternate default U-factors and the calculation method for determining an alternate default SHGC, and to describe the responsibilities of energy consultants, designers, architects, builders, installers, and building departments when an alternate default value is used for determining compliance.

NI.1 Solar Heat Gain Coefficient

Determination of Solar Heat Gain Coefficients for Fenestration without Certified NFRC Values

This section describes the calculation method, eligibility criteria, and documentation requirements for determining the SHGC of fenestration for which there is no certified NFRC value.

Site-Assembled Fenestration Products and Field-fabricated Fenestration

This section describes the alternative calculation method for determining compliance for site-assembled and field-fabricated products similar to eligible site-built products.

Site-assembled fenestration includes both field-fabricated fenestration and fenestration whose frame is previously cut or formed by a manufacturer with the specific intention of being used with a glazing assembly to create a complete fenestration product.

Field-fabricated fenestration is a fenestration product whose frame is made at the construction site of standard dimensional lumber or other materials that were not previously cut or otherwise formed with the specific intention of being used to fabricate a fenestration product.

For site-assembled and field-fabricated fenestration, use the following equation to calculate the fenestration product's SHGC for fenestration that is used to determine compliance. Convert the center of glass SHGC, $SHGC_c$, from the manufacturer's documentation to a value for the fenestration product with framing, $SHGC_{fen}$.

$$\text{SHGC}_{\text{fen}} = 0.08 + 0.86 \times \text{SHGC}_c$$

Where:

~~SHGC_{fen} is the SHGC for the fenestration including glass and frame.~~

~~SHGC_c is the SHGC for the center of glass alone, and~~

~~SHGC_{fen} is the SHGC for the fenestration including glass and frame.~~

Manufactured Fenestration Products

~~This section describes the alternative calculation method for determining compliance for manufactured products that do not have SHGC values published by the National Fenestration Rating Council (NFRC) in the *NFRC Certified Products Directory*.~~

~~Manufactured Fenestration Products without a SHGC certified to the NFRC are similar to those that have an SHGC certified to NFRC. They are complete products, shipped from the manufacturer with the frame and glazing already assembled. These products may be listed in the directory with their U-factors, but without an SHGC. As of January 1, 2001, the number of these products is very small and includes only those with non-planar or translucent glazing. To determine compliance with the building efficiency standards, the center of glass SHGC from the manufacturer's documentation must be converted to an SHGC that includes the framing effect. Use the following equation:~~

~~$$\text{SHGC}_{\text{fen}} = 0.11 + 0.81 \times \text{SHGC}_c$$~~

~~Where:~~

~~SHGC_c is the SHGC for the center of glass alone, and~~

~~SHGC_{fen} is the SHGC for the fenestration including glass and frame.~~

NI.1.2 Responsibilities for SHGC Compliance

This section describes the responsibilities of energy consultants, designers, architects, builders, installers, and building departments when this alternative calculation method is used for determining compliance with SHGC requirements.

NI.1.2.1 Energy Consultants, Designers, Architects

Products with SHGCs Certified to NFRC

~~SHGCs can be found in the *NFRC Certified Products Directory*, SV section. Contact NFRC at 301-589-6372 for a copy of the directory or go to NFRC's website at www.nfrc.org for an online database of the directory.~~

Field-Fabricated Fenestration, Site-Assembled Fenestration and Site-Built Fenestration Products without SHGC Certified to Rated Using NFRC Procedures

~~The procedure described below applies only to skylights and to site-built fenestration in buildings with less than 10,000 ft² of site-built fenestration.~~

~~does not apply to site-assembled vertical glazing in buildings with (a) 100,000 sf or more of conditioned floor area and (b) 10,000 sf or more of vertical fenestration area. For these glazing assemblies, use the NFRC 100SB Label Certificate procedure described above. (For projects where the building has 100,000 sf or more~~

~~of conditioned space and there is 10,000 sf or more of fenestration area, the SHGC of the vertical glazing must be obtained using NFRC 100SB and must be verified by a Label Certificate for Site-Built Products. The Label Certificate must be included with the plans or be provided on site at the time of inspection.)~~

To determine compliance with the efficiency standards, the center of glass SHGC from the manufacturer's documentation for the proposed glazing must be converted to an SHGC_{fen} for the fenestration that includes the framing effect.

For the Prescriptive compliance method, the SHGC_{fen} is then entered into the prescriptive ENV-1 form, Part 2 of 2 and must appear on the building plans.

For the Performance compliance method, the SHGC_{fen} output information printed on the Performance ENV-1 form must be listed on the building plans. The PERF-1 and Performance ENV-1 forms must appear on the plans. The building plan window schedule list must indicate the proposed total SHGC_{fen} values for each fenestration assembly, and these values must be equal to the SHGCs listed on the Performance ENV-1 computer form. (Note: an under-calculation of space conditioning energy can result from entering either too low or too high an SHGC_{fen} for the product.) ~~The proposed design SHGC_{fen} values are entered into the computer program to automatically generate the energy budget of the standard design and the energy use of the proposed design. The building complies if the total energy use of the proposed design is the same or less than the standard design energy budget.~~

Permit applications must include heat gain documentation for the Building Plan Checker. This documentation must include a copy of the manufacturer's documentation showing the SHGC_c, center of glass alone and the calculation used to determine the SHGC_{fen}. If the proposed design uses multiple fenestration products or site-assembled fenestration products, a calculation for each different SHGC_{fen} must be attached to the plans along with each glass unit manufacturer's documentation.

Building plans shall identify all site-built fenestration and all site-built fenestration without SHGCs rated using NFRC procedures.

Mixed Fenestration Types

If mixed fenestration is included in the compliance analysis, then the compliance submittal must demonstrate which are certified fenestration products and which are non-certified fenestration or ~~site-built assembled~~ fenestration products. The manufacturer's documentation and calculations for each product must be included in the submittal, and either the ENV-1 or PERF-1 form must be included on the building plans.

NI.1.2.2 Builder and Installer Responsibilities

The builder is responsible for ~~as~~ensuring that the glass documentation showing the SHGC used for determining compliance is provided to the installer. The builder is responsible for obtaining an NFRC Label Certificate for Site-Built Products for the building's site-built fenestration ~~vertical glazing~~ if the building is 100,000 sf or more and has 10,000 sf ft² or more of site-built fenestration ~~vertical glazing~~.

The builder is also responsible for ~~as~~ensuring that the persons preparing compliance documentation are specifying products that the builder intends to install. The builder must ~~as~~ensure that the glazing contractor installs the glass with the same SHGC_c as used for compliance and that the building inspector is provided with manufacturers' documentation showing the SHGC_c for the actual glass product installed. The builder should verify that these fenestration products are clearly shown on the building plans before fenestration products are purchased and installed.

NI.1.2.3 Building Department Responsibilities

Plan Checker

The building department plan checker is responsible for ~~as~~ensuring that the plans identify all site-built fenestration ~~which fenestration is site-assembled and which is not~~.

The plan-checker is responsible for verifying that for skylights and site-built fenestration using the alternate default SHGC calculation:

1. the SHGC_{fen} and SHGC_c for non-certified fenestration products or site-assembled products is are identified on the plans, that
2. calculations have been provided showing the conversion from SHGC_c to SHGC_{fen}, and that
3. manufacturer documentation of the SHGC_c has been provided for each of the fenestration products using alternate default SHGC calculations, to be installed and
4. the building has less than 10,000 ft² of site-built fenestration.

Plans should be consistent with the compliance documentation, the calculations showing the conversion from SHGC_c to SHGC_{fen}, and Prescriptive ENV-1 Part 2 of 2 or Performance ENV-1.

Building Inspector

The building department field inspector is responsible for ~~as~~ensuring that the building using an alternate default SHGC calculation has less than 10,000 ft² of site-built fenestration.

~~manufacturer's documentation has been provided for the installed fenestration. The inspector is responsible for checking the NFRC label for manufactured fenestration products, or the NFRC 100SB Label Certificate for site-built products where appropriate as described below [see "Energy Consultants, Designers, Architects: Products with SHGCs Certified to NFRC" above].~~

1. ~~All manufactured fenestration products must have either an NFRC label or manufacturer's label with default SHGCs from Table 1-E.~~
2. ~~All site-assembled fenestration products in buildings 100,000 sf of conditioned floor area or more and 10,000 sf of vertical fenestration area or more must have either an NFRC Label Certificate for Site-Built Fenestration Products or a manufacturer's certificate with a default SHGC from Table 1-E.~~
3. ~~Site-assembled vertical fenestration products in buildings less than 100,000 sf, or buildings with less than 10,000 sf of vertical glazing, may use either of the rating/labeling methods described in (b) above, or the SHGC_{fen} calculation method described in this section.~~
4. ~~Horizontal glazing that does not have a certified NFRC SHGC may use any of the above methods for determining and labeling or certifying the SHGC.~~

The field inspector is responsible for ~~as~~ensuring that the ~~certified SHGC, or SHGC_c and SHGC_{fen}~~ for the installed fenestration is consistent with the plans, the Prescriptive ENV-1 Part 2 of 2 or the Performance PERF-1 and Performance ENV-1, and that manufacturer documentation is consistent with the product installed in the building. ~~Plans shall indicate which fenestration is site-assembled or is a fenestration product without SHGCs certified to the NFRC.~~

NI.2 Thermal Transmittance (U-Factor)

Table NI-1 provides default U-factors for skylights and for site-built fenestration in buildings with less than 10,000 ft² of site-built fenestration, covered by the Nonresidential Energy Standards. The default table may be used only for the following:

2. ~~Site-assembled and field-fabricated glazed wall systems in buildings covered by the Nonresidential Energy Standards that have less than 100,000 square feet of conditioned floor area and less than 10,000 square feet of vertical glazing.~~
2. ~~Skylights in buildings covered by the Nonresidential Energy Standards.~~

The default Table NI-1 is consistent with default U-factors published in Table 45, Chapter 3029, ASHRAE Fundamentals Handbook, 2001(1997), which is referenced in the Energy Standards. Fenestration products fitting the two descriptions above may still use U-factors obtained through NFRC if available.

NI.2.1 Responsibilities for U-factor Compliance

This section describes the responsibilities of energy consultants, designers, architects, builders, installers, and building departments when Table NI-1 is used for determining compliance with the U-factor requirements of the Efficiency Standards.

NI.2.1.1 Energy Consultants, Designers, Architects

Products with U-factor Certified to NFRC

U-factor values can be found in the *NFRC Certified Products Directory*. Contact NFRC at 301-589-6372 for a copy of the directory or go to NFRC's website at www.nfrc.org for an online database of the directory.

Field-Fabricated Fenestration, Site-Assembled Fenestration and Fenestration Products Site-Built Fenestration without U-factor Certified to Rated Using NFRC Procedures

The procedure described below applies only to skylights and to site-built fenestration in buildings with less than 10,000 ft² of site-built fenestration. To determine compliance with the efficiency standards, the Glazing Type and Frame Type shown in Table NI-1 must be identified from the manufacturer's documentation for the proposed glazing.

For the Prescriptive compliance method, the U-factor must be selected from Table NI-1 for this Glazing Type and Frame Type and entered into the prescriptive ENV-1 form, Part 2 of 2, and must appear on the building plans.

For the Performance compliance method, the U-factor output information printed on the Performance ENV-1 form must be listed on the building plans. The PERF-1 and Performance ENV-1 forms must appear on the plans. The building plan window schedule list must indicate the proposed total U-factors for each fenestration assembly, and these values must be equal to or less than the U-factors listed on the Performance ENV-1 computer form. ~~The proposed design U-factors are entered into the computer program to automatically generate the energy use of the proposed design. The building complies if the total energy use of the proposed design is the same or less than the standard design energy budget.~~

Permit applications must include fenestration U-factor documentation for the Building Plan Checker. This documentation must include a copy of the manufacturer's documentation showing the Glazing Type information – number of panes, spacing of panes, glass type, gas fill type, coating emissivity and location – and the Frame Type – frame material type, presence of thermal breaks, and identification of structural glazing (glazing with no frame) that is used to determine the U-factor. If the proposed design uses multiple fenestration products or site-assembled fenestration products, manufacturer's documentation for each different U-factor for each glass unit must be attached to the plans ~~for each glass unit~~. Manufacturer's documentation must be provided for each U-factor used for compliance.

Building plans shall identify all site-built fenestration and all site-built fenestration without U-factors rated using NFRC procedures.

Mixed Fenestration Types

If mixed fenestration is included in the compliance analysis, then the compliance submittal must demonstrate which are certified fenestration products and which are non-certified fenestration or site-assembled fenestration products. The manufacturer's documentation and calculations for each product must be included in the submittal, and either the ENV-1 or PERF-1 form must be included on the building plans.

NI.2.1.2 Builder and Installer Responsibilities

The builder is responsible for ~~as~~ensuring that the glass documentation showing the U-factor used for determining compliance is provided to the installer. The builder is responsible for ~~as~~ensuring that the persons preparing compliance documentation are specifying products that the builder intends to install. The builder is also responsible for ~~as~~ensuring that the installer installs glass with U-factors the same or lower than the U-factors ~~as~~ used for compliance and ~~as~~ensuring that the field inspector for the building department is provided with manufacturer's documentation showing the U-factor and method of determining U-factor for the actual fenestration product installed. The builder should verify that these fenestration products are clearly shown on the building plans before fenestration products are purchased and installed.

NI.2.1.3 Building Department Responsibilities*Plan Checker*

The building department plan checker is responsible for ~~as~~ensuring that the plans identify all site-built fenestration, ~~which fenestration is site-assembled and which is not~~. The plan checker is responsible for ~~verifying that the U-factor~~

The plan checker shall ensure that for skylights and site-built fenestration using alternate default U-factors: non-certified fenestration products or site-assembled products is

1. U-factors are identified on the plans, that
2. the Glazing Type and Frame Type and Table NI-1 have been provided ~~showing~~ documenting the method of determining the U-factor, and that
3. manufacturer documentation of the U-factor Glazing Type and Frame Type has been provided for the each of the fenestration products using alternate default U-factors, and to be installed.
4. the building has less than 10,000 ft² of site-built fenestration.

Plans should be consistent with the compliance documentation, the Glazing Type and Frame Type and Table NI-1 values, and Prescriptive ENV-1 Part 2 of 2 or Performance ENV-1.

Building Inspector

The building department field inspector is responsible for ensuring that the building using an alternate default U-factor has less than 10,000 ft² of site-built fenestration.

The building department field inspector is responsible for ~~assuring~~ensuring that manufacturer's documentation has been provided for the installed fenestration. The field inspector is responsible for ~~as~~ensuring that the U-factor for the installed fenestration is consistent with the plans, the Prescriptive ENV-1 Part 2 of 2 or the Performance PERF-1, and Performance ENV-1, and that manufacturer documentation is consistent with the product installed in the building.

~~Plans shall indicate which fenestration is site-assembled or is a fenestration product without U-factor certified to NFRC.~~

Table NI-1 – ~~Assembly Alternate U-Factors for Skylights and Eligible¹ Site-Built Fenestration Unlabeled Glazed Wall Systems (Site-Built Windows) and Unlabeled Skylights~~

Product Type		Vertical Installation				Sloped Installation						
		Unlabeled Glazed Wall Systems (Site Built Windows) (includes site assembled fixed windows only, does <u>not</u> include operable windows)				Unlabeled Skylight with Curb (includes glass/plastic, flat/domed, fixed/operable)				Unlabeled Skylight without Curb (includes glass/plastic, flat/domed, fixed/operable)		
Frame Type		Aluminum without Thermal Break	Aluminum with Thermal Break	Wood/Vinyl	Structural Glazing	Aluminum without Thermal Break	Aluminum with Thermal Break	Reinforced Vinyl/ Aluminum Clad Wood	Wood/Vinyl	Aluminum without Thermal Break	Aluminum with Thermal Break	Structural Glazing
ID	Glazing Type											
	Single Glazing											
1	1/8" glass	1.22	1.11	0.98	1.11	1.98	1.89	1.75	1.47	1.36	1.25	1.25
2	1/4" acrylic/polycarb	1.08	0.96	0.84	0.96	1.82	1.73	1.60	1.31	1.21	1.10	1.10
3	1/8" acrylic/polycarb	1.15	1.04	0.91	1.04	1.90	1.81	1.68	1.39	1.29	1.18	1.18
	Double Glazing											
4	1/4" airspace	0.79	0.68	0.56	0.63	1.31	1.11	1.05	0.84	0.82	0.70	0.66
5	1/2" airspace	0.73	0.62	0.50	0.57	1.30	1.10	1.04	0.84	0.81	0.69	0.65
6	1/4" argon space	0.75	0.64	0.52	0.60	1.27	1.07	1.00	0.80	0.77	0.66	0.62
7	1/2" argon space	0.70	0.59	0.48	0.55	1.27	1.07	1.00	0.80	0.77	0.66	0.62
	Double Glazing, e=0.60 on surface 2 or 3											
8	1/4" airspace	0.76	0.65	0.53	0.61	1.27	1.08	1.01	0.81	0.78	0.67	0.63
9	1/2" airspace	0.69	0.58	0.47	0.54	1.27	1.07	1.00	0.80	0.77	0.66	0.62
10	1/4" argon space	0.72	0.61	0.49	0.56	1.23	1.03	0.97	0.76	0.74	0.63	0.58
11	1/2" argon space	0.67	0.56	0.44	0.51	1.23	1.03	0.97	0.76	0.74	0.63	0.58
	Double Glazing, e=0.40 on surface 2 or 3											
12	1/4" airspace	0.74	0.63	0.51	0.58	1.25	1.05	0.99	0.78	0.76	0.64	0.60
13	1/2" airspace	0.66	0.55	0.44	0.51	1.24	1.04	0.98	0.77	0.75	0.64	0.59
14	1/4" argon space	0.69	0.57	0.46	0.53	1.18	0.99	0.92	0.72	0.70	0.58	0.54
15	1/2" argon space	0.63	0.51	0.40	0.47	1.20	1.00	0.94	0.74	0.71	0.60	0.56
	Double Glazing, e=0.20 on surface 2 or 3											
16	1/4" airspace	0.70	0.59	0.48	0.55	1.20	1.00	0.94	0.74	0.71	0.60	0.56
17	1/2" airspace	0.62	0.51	0.39	0.46	1.20	1.00	0.94	0.74	0.71	0.60	0.56
18	1/4" argon space	0.64	0.53	0.42	0.49	1.14	0.94	0.88	0.68	0.65	0.54	0.50
19	1/2" argon space	0.57	0.46	0.35	0.42	1.15	0.95	0.89	0.68	0.66	0.55	0.51
	Double Glazing, e=0.10 on surface 2 or 3											

Product Type		Vertical Installation				Sloped Installation						
		Unlabeled Glazed Wall Systems (Site Built Windows) (includes site assembled fixed windows only, does <u>not</u> include operable windows)				Unlabeled Skylight with Curb (includes glass/plastic, flat/domed, fixed/operable)				Unlabeled Skylight without Curb (includes glass/plastic, flat/domed, fixed/operable)		
Frame Type		Aluminum without Thermal Break	Aluminum with Thermal Break	Wood/Vinyl	Structural Glazing	Aluminum without Thermal Break	Aluminum with Thermal Break	Reinforced Vinyl/ Aluminum Clad Wood	Wood/Vinyl	Aluminum without Thermal Break	Aluminum with Thermal Break	Structural Glazing
20	1/4" airspace	0.68	0.57	0.45	0.52	1.18	0.99	0.92	0.72	0.70	0.58	0.54
21	1/2" airspace	0.59	0.48	0.37	0.44	1.18	0.99	0.92	0.72	0.70	0.58	0.54
22	1/4" argon space	0.62	0.51	0.39	0.46	1.11	0.91	0.85	0.65	0.63	0.52	0.47
23	1/2" argon space	0.55	0.44	0.33	0.39	1.13	0.93	0.87	0.67	0.65	0.53	0.49
Double Glazing, e=0.05 on surface 2 or 3												
24	1/4" airspace	0.67	0.56	0.44	0.51	1.17	0.97	0.91	0.70	0.68	0.57	0.52
25	1/2" airspace	0.57	0.46	0.35	0.42	1.17	0.98	0.91	0.71	0.69	0.58	0.53
26	1/4" argon space	0.60	0.49	0.38	0.44	1.09	0.89	0.83	0.63	0.61	0.50	0.45
27	1/2" argon space	0.53	0.42	0.31	0.38	1.11	0.91	0.85	0.65	0.63	0.52	0.47
Triple Glazing												
28	1/4" airspaces	0.63	0.52	0.41	0.47	1.12	0.89	0.84	0.64	0.64	0.53	0.48
29	1/2" airspaces	0.57	0.46	0.35	0.41	1.10	0.87	0.81	0.61	0.62	0.51	0.45
30	1/4" argon spaces	0.60	0.49	0.38	0.43	1.09	0.86	0.80	0.60	0.61	0.50	0.44
31	1/2" argon spaces	0.55	0.45	0.34	0.39	1.07	0.84	0.79	0.59	0.59	0.48	0.42
Triple Glazing, e=0.20 on surface 2,3,4, or 5												
32	1/4" airspaces	0.59	0.48	0.37	0.42	1.08	0.85	0.79	0.59	0.60	0.49	0.43
33	1/2" airspaces	0.52	0.41	0.30	0.35	1.05	0.82	0.77	0.57	0.57	0.46	0.41
34	1/4" argon spaces	0.54	0.44	0.33	0.38	1.02	0.79	0.74	0.54	0.55	0.44	0.38
35	1/2" argon spaces	0.49	0.38	0.28	0.33	1.01	0.78	0.73	0.53	0.54	0.43	0.37
Triple Glazing, e=0.20 on surfaces 2 or 3 and 4 or 5												
36	1/4" airspaces	0.55	0.45	0.34	0.39	1.03	0.80	0.75	0.55	0.56	0.45	0.39
37	1/2" airspaces	0.48	0.37	0.26	0.31	1.01	0.78	0.73	0.53	0.54	0.43	0.37
38	1/4" argon spaces	0.50	0.39	0.29	0.34	0.99	0.75	0.70	0.50	0.51	0.40	0.35
39	1/2" argon spaces	0.45	0.34	0.24	0.29	0.97	0.74	0.69	0.49	0.50	0.39	0.33
Triple Glazing, e=0.10 on surfaces 2 or 3 and 4 or 5												
40	1/4" airspaces	0.54	0.43	0.32	0.37	1.01	0.78	0.73	0.53	0.54	0.43	0.37
41	1/2" airspaces	0.46	0.35	0.25	0.29	0.99	0.76	0.71	0.51	0.52	0.41	0.36
42	1/4" argon spaces	0.48	0.38	0.27	0.32	0.96	0.73	0.68	0.48	0.49	0.38	0.32
43	1/2" argon spaces	0.42	0.32	0.21	0.26	0.95	0.72	0.67	0.47	0.48	0.37	0.31

Product Type		Vertical Installation				Sloped Installation						
		Unlabeled Glazed Wall Systems (Site Built Windows) (includes site assembled fixed windows only, does <u>not</u> include operable windows)				Unlabeled Skylight with Curb (includes glass/plastic, flat/domed, fixed/operable)				Unlabeled Skylight without Curb (includes glass/plastic, flat/domed, fixed/operable)		
Frame Type		Aluminum without Thermal Break	Aluminum with Thermal Break	Wood/Vinyl	Structural Glazing	Aluminum without Thermal Break	Aluminum with Thermal Break	Reinforced Vinyl/ Aluminum Clad Wood	Wood/Vinyl	Aluminum without Thermal Break	Aluminum with Thermal Break	Structural Glazing
	Quadruple Glazing, e=0.10 on surfaces 2 or 3 and 4 or 5											
44	1/4" airspaces	0.49	0.38	0.28	0.33	0.97	0.74	0.69	0.49	0.50	0.39	0.33
45	1/2" airspaces	0.43	0.32	0.22	0.27	0.94	0.71	0.66	0.46	0.47	0.36	0.30
46	1/4" argon spaces	0.45	0.34	0.24	0.29	0.93	0.70	0.65	0.45	0.46	0.35	0.30
47	1/2" argon spaces	0.41	0.30	0.20	0.24	0.91	0.68	0.63	0.43	0.44	0.33	0.28
48	1/4" krypton spaces	0.41	0.30	0.20	0.24	0.88	0.65	0.60	0.40	0.42	0.31	0.25

¹ To be eligible, the site-built fenestration must be in a building with less than 10,000 ft² of site-built fenestration.