Appendix NA6 – Alternate Default Fenestration Procedure to Calculate Thermal Performance

NA6.1 Scope

This appendix provides default a procedure for non NFRC certified fenestration products in determining fenestration thermal performance for skylights and site-built vertical fenestration less than 10,000 ft² in area, as excepted from Section 116-(a)-2 and Section 116-(a)-3 of the Standard. For fenestration 10,000 ft² or greater~~not excepted~~, Table 116-A and Table 116-B in the Standards shall be used.

NA6.2 Default U-factor

The default U-factor shall be determined using the following equation:

Equation NA6-1 $U_T = C_1 + C_2 \times U_C$

WHERE

U_T = The fenestration product U-factor

C_1 = C~~c~~oefficient selected from Table NA-1

C_2 = C~~c~~oefficient selected from Table NA-1

U_C = C~~c~~enter of glass U-factor

Table NA-1 –U-factor Coefficients

Product Type	Frame Type	C_1	C_2
Site-Built Vertical Fenestration	Metal ~~Frame~~	0.311	0.872
	Metal Thermal Break ~~Frame~~	0.202	0.867
	Non-Metal~~ic~~ ~~Frame~~	0.202	0.867
Skylights with a Curb	Metal ~~Frame~~	0.711	1.065
	Metal Thermal Break ~~Frame~~	0.437	1.229
	Non-Metal~~ic~~ ~~Frame~~	0.437	1.229
Skylights with no Curb	Metal ~~Frame~~	0.195	0.882
	Metal Thermal Break ~~Frame~~	0.310	0.878
	Non-Metal~~ic~~ ~~Frame~~	0.310	0.878

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NA6.3 Default Solar Heat Gain Coefficient

The SHGC of the fenestration product shall be calculated using the following equation:

Equation NA6-2~~1~~ $SHGC_T = 0.08 + 0.86 \times SHGC_C$

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WHERE

$SHGC_T$ = ~~the~~ SHGC for the fenestration including glass and frame~~.~~

$SHGC_C$ = ~~the~~ SHGC for the center of glass alone~~.~~

Comment [A1]: "and" dangled.

NA6.4 Responsibilities for Compliance

This section describes the responsibilities of energy consultants, designers, architects, builders, installers, and enforcement agencies when using the procedures of this appendix.

NA6.4.1 Energy Consultants, Designers, Architects

The person with responsibility for preparing the compliance documentation shall establish the inputs to the procedure according to the following:

- The center of glass U-factor and SHGC shall be taken from manufacturers' literature and determined using methods consistent with to NFRC 100 and NFRC 200standards.
- The frame type (Metal, Metal T~~t~~hermal B~~b~~reak, or N~~n~~on-metal~~ic or metal~~) shall be verified from manufacturers' literature and through observations of frame sections provided by the manufacturer.

Comment [NRP2]: We added NFRC 100 and 200.

Comment [A3]: We may want to be specific about which standards, but this will take a little research.

For the prescriptive compliance method, the U_T~~,~~and $SHGC_T$, U_C and $SHGC_C$ determined through this procedure shall be entered on the prescriptive ENV-1-C form, Part 2 of 2.

For the performance compliance method, the $U_T$and $SHGC_T$, U_C and $SHGC_C$ determined through this procedure shall be documented on the PERF-1 and Performance ENV-1-C forms.

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For both the prescriptive and performance compliance method, the building plans shall contain a window schedule that lists the U_T and $SHGC_T$ determined through this procedure and the specifications of the windows shall be consistent with the values used in this procedure, e.g. frame type glazing product, etc.

Permit applications must include fenestration U-factor and SHGC documentation for the building plan checker. This documentation must include a copy of the manufacturer's documentation showing the Glazing Type information (center of glass U-factor, center of glass SHGC, number of panes, and coatings) 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 U_T and $SHGC_T$. If the proposed design uses multiple fenestration products, manufacturer's documentation for each fenestration product shall be attached to the plans. Manufacturer's documentation must be provided for each unique combination of glazing and frame used for compliance.

If mixed fenestration is included in the compliance analysis, then the compliance submittal must show which are certified fenestration products, and which are non-certified fenestration products (site-built less than 10,000 ft² or skylights). The manufacturer's documentation and calculations for each product must be included in the submittal, and either the ENV-1-C or PERF-1 form must be included on the building plans.

NA6.4.2 Builder and Installer Responsibilities

The builder must ensure that the fenestration (glass and frame) documentation showing the U-factor used for determining compliance is provided to the installer. The builder is responsible for ensuring that the persons preparing compliance documentation are specifying products the builder intends to install. The builder is responsible for ensuring that the installer installs glass with thermal performance equal to or better than the thermal performance used for compliance and that the frame type installed is the same as that used for compliance. The builder also must ensure that the field inspector for the enforcement agency is provided with manufacturer's documentation showing the thermal performance and method of determining thermal performance for the actual fenestration products installed. The builder should verify that these fenestration products are clearly shown on the building plans before fenestration products are purchased and installed.

NA6.4.3 Enforcement Agency Responsibilities

Plan Checker

The enforcement agency plan checker is responsible for ensuring that the plans identify all skylights and site-built fenestration. The plan checker shall ensure that for skylights and site-built fenestration using alternate default thermal performance determined through this procedure, that:

1. U-factors and SHGC values are shown on the window schedules on the plans,
2. the Glazing Type and Frame Type and which are the basis of this procedure are properly documented,
3. manufacturer documentation of the Glazing Type and Frame Type has been provided for the each of the fenestration products using the procedure of this appendix, and
4. the building has less than 10,000 ft^2 of vertical site-built fenestration.

Plans should be consistent with the compliance documentation.

Building Inspector

The enforcement agency field inspector is responsible for ensuring that the building using the procedure in this appendix has less than 10,000 ft^2 of vertical site-built fenestration.

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