RESNET
RESIDENTIAL ENERGY SERVICES NETWORK

Setting the **Standards** for
Home Energy Efficiency

Interpretation: Manufacturer U-factor & SHGC Data Use

Designation: IR 301-2019-036

Approved: March 3, 2025 by RESNET SDC 300

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Reference:

Standard	ANSI / RESNET / ICC 301-2019 and 301-2022
Page Number(s):	
Sections(s):	4.5 Minimum Rated Features and Normative Appendix B
Table(s):	Inspection Procedure for Minimum Rated Features
Relating to:	Building Element: Windows

Request from:

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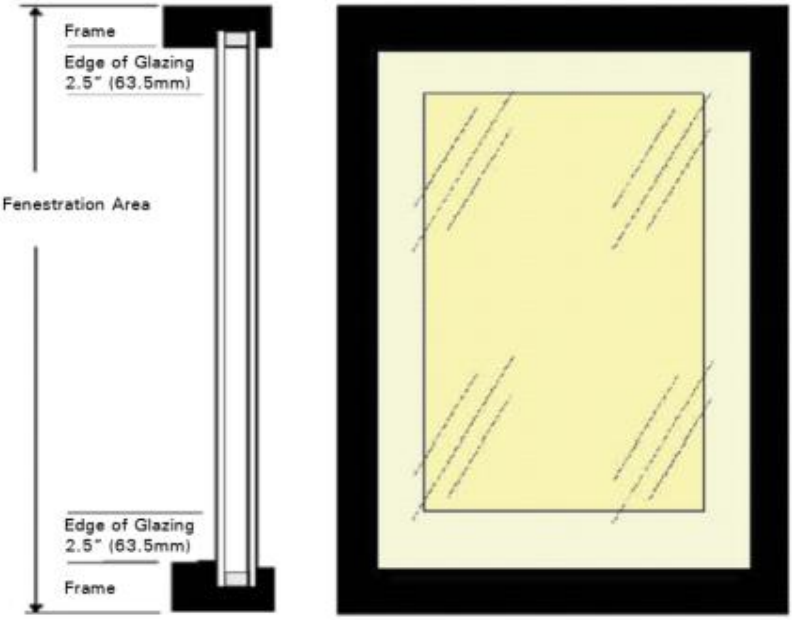
Background Statement: *Provided by person requesting the interpretation.*

Not all windows used in residential construction come to the job site with an NFRC label or are listed on the NFRC Certified Products Directory. Some windows are custom fabricated by manufacturers specifically for the project they are being used on. Because the windows won't be mass produced for use in other projects, the manufacturers do not get the window *unit* certified by an NFRC accredited 3rd party laboratory. However, the *components* (glazing, spacers, frames, etc.) manufacturers use generally have been analyzed in accordance with NFRC and THERM procedures. The performance values of the individual components are then modeled in LBNL software to arrive at an overall U and SHGC value for the specific unit. Examples of these types of window units include punched, storefront, and curtain wall systems that have been custom fabricated by a manufacturer and sized to fit a particular opening.

An excerpt from reporting provided by a manufacturer of custom curtain wall systems is provided in figures 1 and 2.

U-Value Determination for Spandrel Areas
The overall fenestration U-value is based on area-weighted component U-values of frame, edge-of-glass, and center-of-glass.



Window 7.6 & 7.7 calculates the overall, area weighted U-value using the following formula:

$$U = \frac{\Sigma(U_{frame} * A_{frame}) + \Sigma(U_{edge} * A_{edge}) + \Sigma(U_{center} * A_{center})}{A_{total}}$$

U = Overall fenestration U-value, W/m²-K (BTU/hr-ft²-°F)
Uframe = Frame U-value, W/m²-K (BTU/hr-ft²-°F)
Uedge = Edge-of-glass U-value, W/m²-K (BTU/hr-ft²-°F)
Ucenter = Center-of-glass U-value, W/m²-K (BTU/hr-ft²-°F)
Atotal = Total fenestration area, m² (ft²)
Aframe = Frame area, m² (ft²)
Aedge = Edge-of-glass area, m² (ft²)
Acenter = Center-of-glass area, m² (ft²)

Note: Individual frame and edge-of-glass U-values are determined using Therm 7.6. U-values are based on NFRC 100 standard winter conditions.

Figure 1 – Method used to determine U-Value of unit

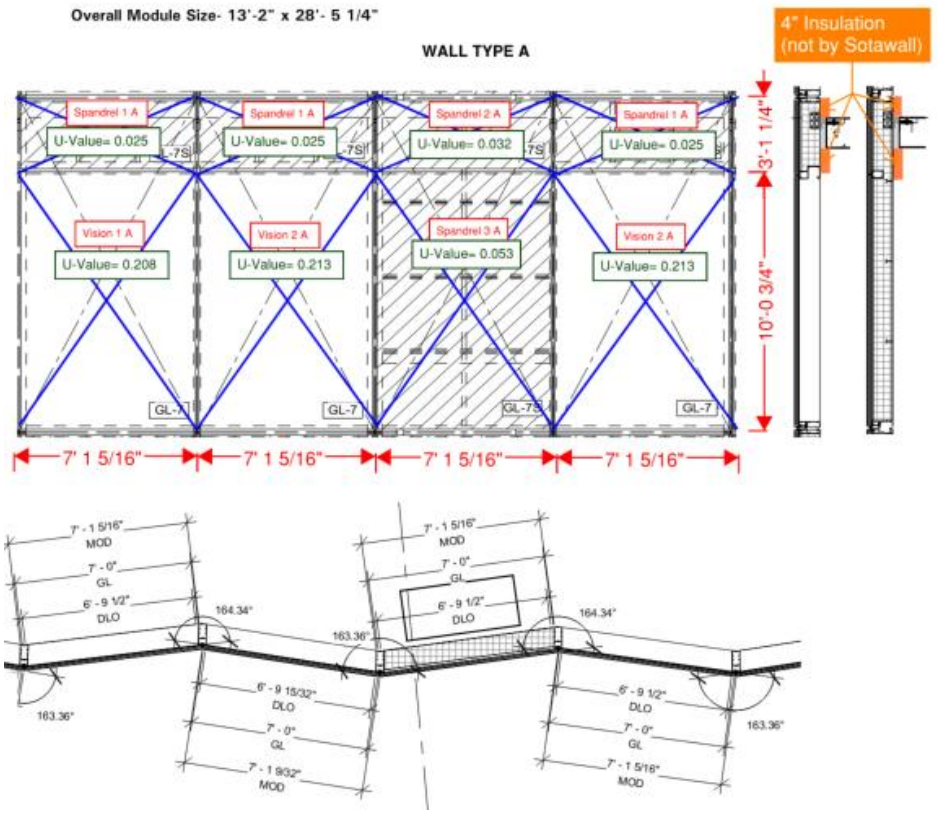


Figure 2 – Reported U-Values for each unit

Section 4.5.2.1 of ANSI/RESNET/ICC 301 talks specifically about envelope features by stating, "The envelope thermal characteristics of building elements 1 through 8 set forth in Table 4.5.2(1) shall be determined by site observation. Where thermal characteristics cannot be determined during site observation, the manufacturer's data sheet shall be used."

Appendix B of the standard states in part that, "Where no (NFRC) label is found, identify window in NFRC Certified Products Directory to determine U-value or consult manufacturer's data sheet. If no U-value is identified from window label, product literature, or NFRC directory, use the known window characteristics to select the U-value from Table 4 in ASHRAE Handbook of Fundamentals".

Proposed Interpretation: *Provided by person requesting the interpretation and modified by the committee.*

> Signed and dated documentation provided by the manufacturer, listing the U-factor and SHGC for a window they manufacture is considered equivalent to a "manufacturer's data sheet" or "product literature" and an acceptable way to document the window unit's performance values.

SDC Response:

Is the proposed interpretation correct? ___X__ Yes _____ No

SDC Comments: