

## 7. Fenestration U-Factors

Prescriptive fenestration (windows and doors) and skylight values are given in terms of U-factor. The lower the U-factor, the better a product is at reducing heat loss. U-factor, when used for windows and skylights, takes into account more than conductive heat loss. It also includes window air leakage.

### Montana Fenestration U-Factor Requirements

Fenestration U-Factor	Skylight U-Factor
<b>0.32</b>	<b>0.55</b>


U-factors of fenestration products (windows, doors and skylights) must be determined in accordance with National Fenestration Rating Council (NFRC) Standard 100 by an accredited, independent laboratory, and labeled and certified by the manufacturer. If a window, door, or skylight has no NFRC label then the code official is to assume the values given in a default table in International Energy Conservation Code (IECC)

Section R303. The default values of this table do not meet the prescriptive requirements for fenestration or skylights. The maximum U-factor allowed for fenestration in the code is 0.32. In addition to displaying the U-factor, the NFRC label includes several other characteristics. Solar Heat Gain Coefficient (SHGC) can be useful in understanding how much of the sun's heat passes through the glazing. The higher the SHGC value between 0 and 1, the more solar heat will be admitted by the glazing. There is no requirement for Solar Heat Gain Coefficient in the Montana climate zone.

It is permissible to use an area weighted U-factor calculation to comply with the basic prescriptive U-factor requirement (R402.3.1). Some fenestration areas may have a U-factor that exceeds 0.32 if the overall average U-factor complies.

### Glazed Fenestration Exemption

Up to 15 square feet of glazed fenestration per dwelling unit is exempt from U-factor requirements. This exemption does not apply to the U-factor alternative approach nor the Total UA alternative approach. (IECC R402.3.3)

 National Fenestration Rating Council <b>CERTIFIED</b>	<b>World's Best Window Co.</b> Millennium 2000+ VinylClad Wood Frame Double Glazing • Argon Fill • Low E Product Type: <b>Vertical Slider</b>
ENERGY PERFORMANCE RATINGS	
U-Factor (U.S./I-P) <b>A 0.32</b>	Solar Heat Gain Coefficient <b>B 0.32</b>
ADDITIONAL PERFORMANCE RATINGS	
Visible Transmittance <b>C 0.51</b>	Air Leakage (U.S./I-P) <b>D 0.2</b>
Condensation Resistance <b>E 51</b>	<b>—</b>
Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information. <a href="http://www.nfrc.org">www.nfrc.org</a>	



**Opaque Door Exemption**

One side-hinged opaque door up to 24 square feet in area is exempted from the *U-factor requirement*. This exemption does not apply to the U-factor alternative approach nor the UA alternative approach (IECC R402.3.4)

**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 must meet the applicable requirements for *U-factor*. (IECC R402.3.6)

**Plan Review**

Verify that the specified windows, doors, and skylights comply with the U-factor requirements.

**Inspection**

Verify that the windows, doors, and skylights are the same as shown on the submittal documents and are labeled with NFRC labels.

**Code Reference**

**Table R402.1.1 Insulation and Fenestration Requirements by Component (Excerpt)**

<b>Fenestration U-Factor</b>	<b>Skylight U-Factor</b>
<b>0.32</b>	<b>0.55</b>

**R303.1.3 Fenestration Product Rating**

U-factors of fenestration products (windows, doors and skylights) shall be determined in accordance with NFRC 100 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled *U-factor* shall be assigned a default *U-factor* from Table R303.1.3(1) or R303.1.3(2). The solar heat gain coefficient (SHGC) and *visible transmittance* (VT) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled SHGC or VT shall be assigned a default SHGC. (*Note: There is no Solar Heat Gain Coefficient requirement for the Montana Climate Zone.*)

**R303.1.3(3). Table R303.1.3(1) Default Glazed Fenestration U-Factor**

Table R303.1.3 (1) FRAME TYPE	Single Pane	Double Pane	Skylight	
			Single	Double
<b>Metal</b>	<b>1.2</b>	<b>0.8</b>	<b>2</b>	<b>1.3</b>
<b>Metal with Thermal Break</b>	<b>1.1</b>	<b>0.65</b>	<b>1.9</b>	<b>1.1</b>
<b>Nonmetal or Metal Clad</b>	<b>0.95</b>	<b>0.55</b>	<b>1.75</b>	<b>1.05</b>
<b>Glazed Block</b>	<b>0.6</b>			

**Table R303.1.3 (2)**

<b>Door Type</b>	<b>U-Factor</b>
<b>Uninsulated Metal</b>	<b>1.2</b>
<b>Insulated Metal</b>	<b>0.6</b>
<b>Wood</b>	<b>0.5</b>
<b>Insulated, nonmetal edge, max 45% glazing double pane</b>	<b>0.35</b>

**Resources**

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