

**4. What's in a Window Label?**

The IECC requires that the U-factors of fenestration products (windows, doors and skylights) 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 Section R303. The default values of this table do not meet the prescriptive energy code requirements. The maximum U-factor allowed for fenestration in the code is 0.32 for Montana.

		<b>World's Best Window Co.</b> Millennium 2000+ Vinyl-Clad Wood Frame Double Glazing • Argon Fill • Low E Product Type: Vertical Slider	
<b>ENERGY PERFORMANCE RATINGS</b>			
U-Factor (U.S./I-P) <b>A 0.32</b>		Solar Heat Gain Coefficient <b>B 0.32</b>	
<b>ADDITIONAL PERFORMANCE RATINGS</b>			
Visible Transmittance <b>C 0.51</b>		Air Leakage (U.S./I-P) <b>D 0.2</b>	
Condensation Resistance <b>E 51</b>		—	
<small>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. www.nfrc.org</small>			

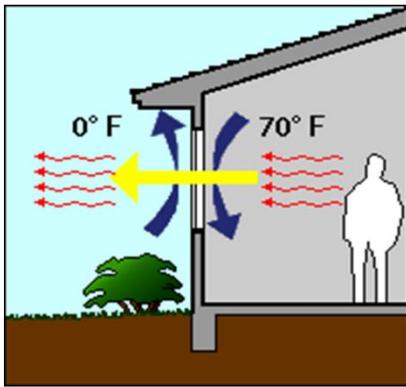
Source: www.nfrc.org

NFRC is a third-party non-profit organization that sponsors certified rating and labeling to help consumers compare the performance of windows, doors, and skylights. NFRC does not distinguish between “good” and “bad” windows, set minimum performance standards, or mandate performance levels. NFRC-certified products are independently tested, certified, and labeled to assist purchasers and provide an independent third-party rating. The energy code establishes the minimum U-factor allowed.

In addition to displaying the U-factor, the NFRC label includes several other characteristics that are useful in design. 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 (SHGC) in the Montana climate zone.

While an ENERGY STAR label signifies if a product is energy-efficient, the NFRC label helps compare between energy-efficient products by breaking down a product’s energy performance. Following is a summary of the factors included on the NFRC label.

**U-Factor.** U-factor measures how well a product performs at reducing heat loss to the outside or heat gain from the outside. The lower the U-factor, the better the window, skylight, or door is at reducing heat transfer.

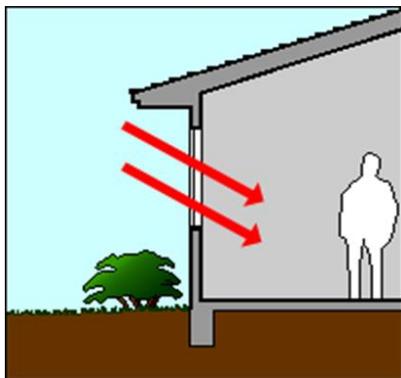


Source: www.nfrc.org

### U-Factor

 <b>World's Best Window Co.</b> Millennium 2000 <sup>+</sup> Vinyl-Clad Wood Frame Double Glazing - Argon Fill - Low E Product Type: Vertical Slider CERTIFIED	
<b>ENERGY PERFORMANCE RATINGS</b>	
U-Factor (U.S./I-P)	Solar Heat Gain Coefficient
<b>A 0.32</b>	<b>B 0.32</b>
<b>ADDITIONAL PERFORMANCE RATINGS</b>	
Visible Transmittance	Air Leakage (U.S./I-P)
<b>C 0.51</b>	<b>D 0.2</b>
Condensation Resistance	
<b>E 51</b>	—
<small>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. www.nfrc.org</small>	

**Solar Heat Gain Coefficient (SHGC).** The SHGC measures how well a product can resist heat gain from the sun, which is especially important during summer cooling season. The SHGC value can range from zero to one. The lower the number, the less solar heat is added through the window or skylight. If the window will be used as part of a passive solar design then a higher value would be preferred.

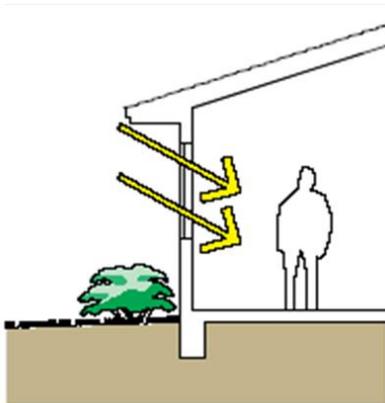


Source: www.nfrc.org

### Solar Heat Gain Coefficient

 <b>World's Best Window Co.</b> Millennium 2000 <sup>+</sup> Vinyl-Clad Wood Frame Double Glazing - Argon Fill - Low E Product Type: Vertical Slider CERTIFIED	
<b>ENERGY PERFORMANCE RATINGS</b>	
U-Factor (U.S./I-P)	Solar Heat Gain Coefficient
<b>A 0.32</b>	<b>B 0.32</b>
<b>ADDITIONAL PERFORMANCE RATINGS</b>	
Visible Transmittance	Air Leakage (U.S./I-P)
<b>C 0.51</b>	<b>D 0.2</b>
Condensation Resistance	
<b>E 51</b>	—
<small>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. www.nfrc.org</small>	

**Visible Transmittance (VT).** Visual transmittance (VT) measures how well a window or skylight will provide daylight to the building, potentially reducing energy use for artificial lighting. The VT value can range from zero to one. The higher the VT value, the more natural light is allowed to pass through the glazing into the building.



Source: www.nfrc.org

### Visible Transmittance

 <b>World's Best Window Co.</b> Millennium 2000 <sup>+</sup> Vinyl-Clad Wood Frame Double Glazing - Argon Fill - Low E Product Type: Vertical Slider CERTIFIED	
<b>ENERGY PERFORMANCE RATINGS</b>	
U-Factor (U.S./I-P)	Solar Heat Gain Coefficient
<b>A 0.32</b>	<b>B 0.32</b>
<b>ADDITIONAL PERFORMANCE RATINGS</b>	
Visible Transmittance	Air Leakage (U.S./I-P)
<b>C 0.51</b>	<b>D 0.2</b>
Condensation Resistance	
<b>E 51</b>	—
<small>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. www.nfrc.org</small>	

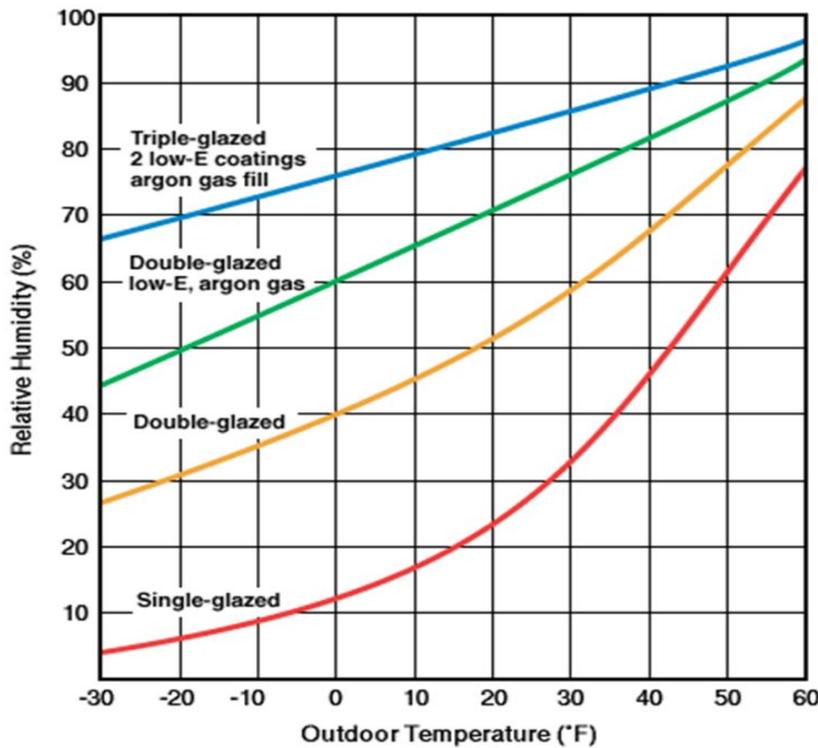


**Air Leakage.** Air leakage measures how much air will enter a building through a window, door, or skylight. The lower the number, the fewer drafts and lower air leakage. The values can range from 0.1 to 0.3.

**Condensation.** NFRC also has a condensation rating that is optional for manufacturers to include, so it may or may not appear on the label. The higher the number, from 1 to 100, the better a product resists condensation.

Condensation is an important indicator of humidity in the building as well as the quality of windows and skylights. Condensation on windows is a common call-back for builders. Condensation is largely the result of three factors. Those factor are the resistance of the window to heat transfer, the outside air temperature, and the indoor relative humidity. The accompanying graph illustrates that relationship. Even very low U-factor windows will allow condensation if the outdoor temperature is low enough and the indoor humidity is high enough. Installing a low U-factor window and maintaining a relatively low indoor relative humidity will minimize the occurrence of condensation.

 <b>World's Best Window Co.</b> Millennium 2000+ Vinyl-Clad Wood Frame Double Glazing • Argon Fill • Low E Product Type: Vertical Slider	
<b>ENERGY PERFORMANCE RATINGS</b>	
U-Factor (U.S./I-P)	Solar Heat Gain Coefficient
<b>A 0.32</b>	<b>B 0.32</b>
<b>ADDITIONAL PERFORMANCE RATINGS</b>	
Visible Transmittance	Air Leakage (U.S./I-P)
<b>C 0.51</b>	<b>D 0.2</b>
Condensation Resistance	
<b>E 51</b>	—
<small>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. www.nfrc.org</small>	



**Window Condensation Graph**

Source: Lawrence Berkeley National Laboratory



### Field Inspection

1. Inspect that all windows, doors, and skylights for NFRC labels.
2. Verify that the U-factors on the NFRC labels for windows, doors, and skylights are at least as good as those on the permit submission documents, U-32 maximum code value.

### Code References

#### **2012 IECC Section 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 or VT from Table R303.1.3(3).

### Resources

*2012 International Energy Conservation Code*, Copyright August 2011 by the International Energy Codes Council, Inc., Falls Church, Virginia.

*2012 IECC Code and Commentary*, Copyright August 2012 by the International Energy Codes Council, Inc., Falls Church, Virginia.

National Fenestration Rating Council, <http://www.nfrc.org/about/>