

## Proposal to Modify the ENERGY STAR Residential Fenestration Specifications In Canada

In December, 2016, the pan-Canadian climate plan was adopted as policy by the federal and provincial governments in order to accelerate actions on climate change to meet Canada's commitments under the Paris Accord agreement. This plan includes carbon pricing, adaption, promoting clean technology and reducing emissions. Increasing energy efficiency is a key part of the plan and includes measures for new and existing buildings of which windows and doors are an integral part.

To begin the process of moving the residential fenestration market towards greater efficiency, it was decided that the ENERGY STAR® specifications should become more stringent by 2020. Natural Resources Canada (NRCan) had a survey conducted in the fall of 2017 followed by a technical analysis<sup>1</sup> on various options and scenarios for a path forward. Based on this study and other input from key stakeholders, NRCan is proposing more stringent ENERGY STAR fenestration criteria for 2020 and more stringent Windows Most Efficient criteria for 2019 as detailed in this document.

### Proposed Criteria

The proposed criteria for the fenestration specification is a modified version of the current ENERGY STAR Zone 3 levels and would apply to all of Canada with an implementation date of January 1, 2020. The criteria is intended for low-rise residential dwellings<sup>2</sup>. The two paths of compliance, U-factor and Energy Rating (ER), for windows and doors would remain.

ENERGY STAR Criteria for Canada Residential Windows and Doors (effective January 1, 2020)						
Minimum Energy Rating (unitless)	and	Maximum U-factor W/m <sup>2</sup> (Btu/h·ft <sup>2</sup> F)	OR	Maximum U-factor W/m <sup>2</sup> (Btu/h·ft <sup>2</sup> F)	and	Minimum Energy Rating Windows and Sliding Glass Doors Only (unitless)
34	and	1.48 (0.26)		1.20 (0.21)	and	22

ENERGY STAR Criteria for Canada Unit Skylights (effective January 1, 2020)	
Maximum U-factor	
W/m <sup>2</sup>	Btu/h·ft <sup>2</sup> F
2.10	0.37

A conservative estimate puts the additional energy savings at 60,000 GJ more than the current 2015 fenestration specification obtains. Approximately 75% of the currently registered fenestration products would be eliminated from the program. Figure 1 shows the energy performance of the window models that would be eliminated (shaded portion).

<sup>1</sup> ENERGY STAR Technical Specification and Most Efficient Criteria Analysis 2018.

<sup>2</sup> Defined by the Canadian National Building Code as a building three stories or less and not exceeding 600 m<sup>2</sup> in size.

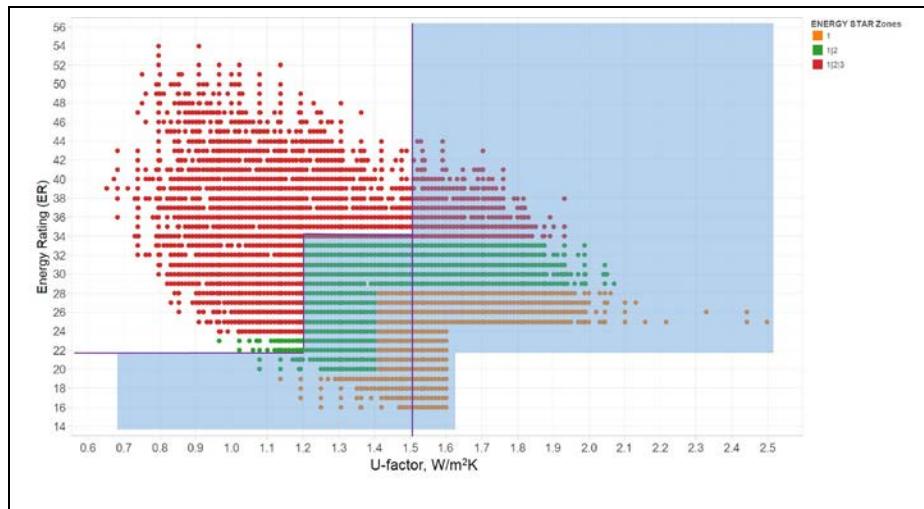


Figure 1

In anticipation of the more stringent fenestration specification for 2020, it is also proposed that the Windows Most Efficient specification be made more stringent effective January 1, 2019 as follows:

ENERGY STAR Windows Most Efficient Criteria for Canada (effective January 1, 2019)						
Minimum Energy Rating (unitless)	and	Maximum U-factor W/m <sup>2</sup> (Btu/h·ft <sup>2</sup> ·F)	OR	Maximum U-factor W/m <sup>2</sup> (Btu/h·ft <sup>2</sup> ·F)	and	Minimum Energy Rating
39	and	1.31 (0.23)		1.02 (0.18)	and	26

### Climate Zones

The Canadian ENERGY STAR climate zones have served us well since their creation in 2003 and modification in 2015; however, the range of energy performance to support the zones is becoming narrower and narrower as the less efficient products are eliminated from eligibility. Therefore, NRCan is proposing to adopt the same criteria for all of Canada. Having the same criteria nation-wide will simplify the program for the industry, builders, and, most importantly, for the consumer. It will also promote greater compliance and clarity as a model is either ENERGY STAR certified or it is not regardless of where it is installed. In addition, the more stringent Windows Most Efficient specification can be considered a second zone or tier as a “stretch goal” for the industry.

### Modifications

The ENERGY STAR program is more than just saving energy although that is, of course, an important aspect. There is also consumer acceptance and brand integrity to think about. An ENERGY STAR certified product that does not do what it is supposed to do or that has unintentional and detracting consequences is not desirable. Therefore, NRCan is proposing the following modifications to the current Zone 3 criteria:

### 1. *U-Factor “Cap”*

A 2013 study of ER<sup>3</sup> noted that there is a direct correlation between U-factor and window “surface temperature discomfort”. This could lead to occupant discomfort in some situations. In addition, windows and glazed doors with lower U-factors are often more resistant to condensation. Because U-factor is a significant variable in the ER equation, NRCan is proposing to limit the U-factor on the ER path of compliance to 1.48 W/m<sup>2</sup> (0.26 Btu/h·ft<sup>2</sup>°F) for the fenestration specification and 1.31 (0.23 Btu/h·ft<sup>2</sup>°F) for the Most Efficient specification.

### 2. *Minimum Energy Rating (ER)*

Although solar gain is still important overall in Canada, the 2013 study of ER also showed that higher solar gain may contribute to greater thermal discomfort during the cooling season. In some cases this would lead to increased electrical consumption due to increased cooling loads. Therefore, NRCan is proposing to reduce the minimum ER on the U-factor compliance path for the fenestration specification from 24 to 22. For the Windows Most Efficient criteria, it is proposed that the current minimum ER of 26 on the U-factor compliance path remain the same even though the criteria is becoming more stringent. In both cases, this would mean that the minimum allowable solar heat gain (SHGC) would be reduced from approximately 0.21 to 0.17 at the maximum allowable value on the U-factor compliance path. This will allow greater flexibility in the choice of glazing, especially for the new construction market.

#### Comparison With U.S. ENERGY STAR Program

The highest U-factor currently allowed for the heating-dominated U.S. Northern Zone for windows and doors is 1.70 (.30)<sup>4</sup> and for skylights is 2.84 (0.50). The highest U-factor for windows and doors allowed in the proposed specification for all of Canada would be significantly more stringent at 1.48 (0.26) and 2.10 (0.37) for skylights. The proposed single criteria for all of Canada would match the U.S. approach of a single heating dominated climate zone.

#### Comments

Please address any comments about this proposal to:

Steve Hopwood  
Account Manager – Fenestration Products  
Equipment Division  
Natural Resources Canada  
613-995-6741  
[steve.hopwood@canada.ca](mailto:steve.hopwood@canada.ca)

Comments should be received by **March 30, 2018**.

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<sup>3</sup> Review of Energy Rating Procedure in Canada, January 2013, RDH Building Engineering Ltd., pp. 115-182.

<sup>4</sup> With an SHGC of 0.42 or higher.