



**Pilkington North America, Inc.**

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February 11, 2013

U.S. Environmental Protection Agency  
Via email: [windows@energystar.gov](mailto:windows@energystar.gov)

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Re: Comments to ENERGY STAR for Windows, Doors and Skylights Version 6.0 Draft 2 Criteria

Dear Doug and Emily,

On behalf of NSG Group/Pilkington North America ("PNA"), I express our appreciation for this opportunity to provide comments in response to Draft 2 of EPA's proposed to ENERGY STAR for Windows, Doors and Skylights Version 6.0.

Best regards,

A handwritten signature in blue ink, appearing to read "CLaFayette", written over a series of horizontal lines.

Connie K. LaFayette  
Business Development Manager – Architectural Glass  
NSG Group | Pilkington North America, Inc.

**Comments of NSG Group/Pilkington North America to  
Energy Star for Windows, Doors, and Skylights  
Version 6.0 Draft 2 Criteria**

NSG Group/Pilkington North America ("PNA") submits the following comments to the Energy Star for Windows, Doors, and Skylights ("Energy Star" or "U.S. Energy Star Program") Version 6.0 Draft 2 Criteria dated January 7, 2013 ("Draft 2 Criteria").

**A. EPA Responsiveness**

PNA appreciates EPA's responsiveness to stakeholder concerns expressed in response to the Draft 1 Criteria.

**1. Doors**

EPA responded positively to comments by the Association of Millwork Distributors, Milgard Windows & Doors, Pella Corporation and ProVia Products asking for changes in the ½ lite door U-factor criteria (changed from  $\leq 0.23$  to  $\leq 0.25$ ) and the full lite door SHGC criteria in the northern zone (changed to  $\leq 0.40$ ), where the  $\leq 0.25$  SHGC criteria was causing color mis-matches between the low SHGC door glazing and more energy efficient high SHGC windows in northern homes.

PNA believes that technically, full lite doors should be subject to the same Energy Star criteria as windows. This will be more fully developed in section C. below.

**2. Northern Trade-offs**

EPA also responded positively to comments submitted by PNA, AGC Glass Company North America, Inc. ("AGC"), the Consortium for Energy Efficiency ("CEE") and Mathews Brothers Company suggesting that the number of trade-offs in the northern climate zone be increased (changed from a single trade-off to three).

**3. Minimum Northern SHGC**

EPA declined to include a minimum SHGC in the Draft 2 Criteria for the northern zone. Despite its strong belief that a minimum SHGC in the north would be cost effective and result in a significant increase in the aggregate energy that would be saved in the north, PNA will support EPA's decision not to include a minimum SHGC in Energy Star Version 6.0; however, PNA will pursue the energy savings associated with a minimum SHGC in the next version of Energy Star criteria.



#### **4. Northern U-factor**

PNA, AGC, CEE, PPG Industries, Inc. ("PPG"), the Aluminum Extruders Council, and EverSealed Windows all sought a more stringent U-factor than proposed in the Draft 1 Criteria for the northern zone. Several stakeholders, including PNA, AGC and PPG, asked for the northern U-factor to be reduced from 0.27 to 0.25. Nevertheless, EPA declined to change the northern prescriptive U-factor from the 0.27 U-factor proposed in the Draft 1 Criteria.

#### **B. The Northern Zone U-factor Should be Lowered to 0.25**

PNA urges EPA to reconsider its decision not to reduce the northern U-factor to 0.25. There are a number of reasons that compel the conclusion that the northern zone prescriptive U-factor should be 0.25.

##### **1. Reducing U-factor to 0.25 Will Ensure a Real U-factor Improvement in the North**

Setting the U-factor at 0.27 does **not** ensure any real improvement to U-factor in the northern zone. In that regard, NFRC's draft Independent Verification Program, NFRC 713-2013 ("Verification Program"), establishes a 10% U-factor performance tolerance for northern windows.<sup>1</sup> This means that, under the Verification Program, an Energy Star labeled window bearing an NFRC label with a 0.27 U-factor would successfully pass the U-factor verification test with a U-factor of 0.30. Since the current Version 5.0 Energy Star northern prescriptive criteria is 0.30, reducing the northern U-factor to 0.27 does **not** ensure any real improvement in the Version 6.0 northern U-factor criteria.

Reducing the northern U-factor to 0.25 **does** ensure that there will be a real U-factor improvement in the north over Energy Star Version 5. Even taking the 10% northern U-factor performance tolerance into account, an Energy Star labeled window with an NFRC label would only successfully pass the U-factor verification if its tested U-factor was  $\leq 0.28$ .

The northern prescriptive U-factor should be reduced to 0.25 in order to ensure that there is a real U-factor improvement in the north. Changing it from the 0.30 specified in Version 5 to 0.27 is a mere 10% reduction that does nothing more than match the U-factor tolerance for northern windows under the Verification Program. Such a small reduction is, simply, too small to assure that any **real** improvement to northern U-factor will actually be made.

##### **2. Adding Trade-offs to a 0.25 Prescriptive U-factor**

##### **Provides Maximum Flexibility from which to Achieve Compliance**

If the northern prescriptive U-factor is reduced to 0.25 and the same trade-off principles from the Draft 2 Criteria are applied, numerous U-factor and SHGC combination windows will be available to achieve compliance with the northern Energy Star criteria. In that regard, the prescriptive U-factor with equivalent performing U-factor and matching SHGC window products would look like this:

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<sup>1</sup> NFRC Independent Verification Program, 713-2013, Table 2, p. 12.

U-factor	SHGC
$\leq 0.25$	NR
$= 0.26$	$\geq 0.22$
$= 0.27$	$\geq 0.27$
$= 0.28$	$\geq 0.32$
$= 0.29$	$\geq 0.37$
$= 0.30$	$\geq 0.42$

If adopted, this northern criteria would enable manufacturers to use numerous U-factor and SHGC combinations to achieve compliance with Energy Star's criteria. It would provide those developing and manufacturing Energy Star compliant windows with significant flexibility along with an opportunity to benefit from both manufacturing and distribution efficiencies in ways that are consistent with consumers achieving maximum energy savings. As but one example, under this 0.25 prescriptive U-factor criteria, a 0.29 U-factor window with an SHGC between 0.37 and 0.40 could comply with Energy Star criteria in **both** the northern and north central climate zones. This would allow manufacturers to maximize manufacture and distribution efficiencies in these zones while assuring that consumers will reap the benefits of significant energy savings.

### **3. A 0.25 Prescriptive U-factor is Achievable and Technically Justified as Evidenced by its Adoption in the Canadian Energy Star Program.**

A 0.25 prescriptive U-factor is clearly achievable and technically justified. This is evident from the fact that Canada's Energy Star Program is adopting a prescriptive 0.25 U-factor for Climate Zone 2, its most populace region.

On December 21, 2012, Natural Resources Canada ("NRCan") issued its Revised Proposed Changes to the Canadian ENERGY STAR technical Specification ("NRCan Technical Specification").<sup>2</sup> In exchange for a modest extension of time for compliance, NRCan stakeholders generally agreed to accept more stringent qualifying levels, including a 0.25 prescriptive U-factor in Canada's most populace Climate Zone 2: The "[m]ore stringent qualifying levels were generally accepted by stakeholders ... if the industry was given more time to adapt which NRCan is now proposing to do."<sup>3</sup>

NRCan's qualifying levels consist of two parts, a prescriptive U-factor path and an Energy Rating ("ER") path.

The prescriptive U-factor path in the NRCan Technical Specification is very much like the prescriptive U-factor found in the Draft 2 Criteria's northern zone. Likewise, although not exactly the same, the ER path in Canada is similar to the types of northern trade-offs that are now proposed in

<sup>2</sup> A copy of Natural Resources Canada's Revised Proposed Changes to the Canadian Energy Star Technical Specification dated December 21, 2012, is attached as Appendix A ("NRCan Technical Specification").

<sup>3</sup> NRCan Technical Specification, p. 2.



the Draft 2 Criteria. In that regard, both the ER path and the northern trade-offs match U-factors with SHGCs to identify windows that will provide an energy performance equivalent to the prescriptive U-factor path.

NRCAN has three climate zones. Climate zone 1 (>3500 HDD) is a relatively small Pacific coastal zone and Zone 3 ( $\geq 6000$  HDD) is Canada's far north. Zone 2 (3500 to < 6000 HDD) covers most population centers in Canada and shares the same climate as much of the U.S. Energy Star's northern zone (3000 to < 5000 HDD).

When NRCAN's new Technical Specification takes effect on February 1, 2015, Energy Star labeled windows in NRCAN's Zone 2 will be required to meet a prescriptive U-factor path of 0.25 or a U-factor and SHGC combination that together yield an equivalent energy performance as expressed in an ER of 29.

The fact that a 0.25 U-factor (or equivalent ER) will be required for Energy Star labeled windows throughout Canada's most populace Climate Zone 2 is compelling evidence that a 0.25 prescriptive U-factor is both achievable and technically justified in the northern climate zone of the United States. This is especially true since Canada's Climate Zone 2 is essentially the same as the northern climate zone in the United States. Given the strong climate similarities between Canada's Zone 2 and the northern climate zone of the U.S., there is nothing in an artificial border line drawn on a map that would justify using a lower U-factor on one side and a higher U-factor on the other side of the border. The very same windows that will be manufactured for Energy Star labeling in Canada's Zone 2 will be equally available for sale on the U.S. side of the border.

#### **4. The International Residential Code ("IRC") will consider a**

##### **0.25 U-factor with Trade-offs in its Climate Zones 5-8 in its Current Development Cycle.**

The IRC development cycle began on January 3, 2013, with the submission of code change proposals. It will end in with the conclusion of the International Code Council's Final Action hearings on October 9, 2013.

PNA and AGC submitted a proposed change which, if adopted, would change the criteria for IRC climate zones 5-8, which coincides with Energy Star's northern zone, to a prescriptive U-factor of 0.25 with the U-factor and SHGC trade-offs listed in B.2. above.<sup>4</sup>

It will not be known until October 9, 2013, whether the proposed change submitted by PNA and AGC will be adopted. However, if it is, it will become a part of the IRC as of January 1, 2015. Since Energy Star's Version 6 is scheduled to take effect on January 1, 2014, it is possible that Energy Star will have a 0.27 northern climate zone criteria on January 1, 2014, while the IRC will have moved to a prescriptive 0.25 U-factor. That will either result in the IRC being more stringent than the Energy Star criteria in the northern zone or necessitate changes to Energy Star's Version 6 between October 2013 and its proposed effective date of January 1, 2014. Otherwise, it would require EPA to move the effective date back of Version 6 back in order to institute changes that would keep Energy Star at least current with the prescriptive requirements of the IRC.

The easiest way to avoid these potentially difficult issues is to, simply, change the northern U-factor to a prescriptive 0.25 with the trade-offs listed in B.2. above.

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<sup>4</sup> A copy of the proposed code change is attached hereto as Appendix B.

### **C. The SHGC for a Full Lite Door Should be "NR" in the Northern Zone**

A full lite sliding door is essentially a large, operable window from the standpoint of energy performance. There is no reason for a full lite door to have a different SHGC Energy Star criteria in the north than the SHGC associated with the prescriptive U-factor criteria for windows. Since the SHGC associated with the prescriptive U-factor criteria for windows in the northern zone is "NR" the SHGC criteria for a full lite door should also be "NR."

In the NRCan's most recent ENERGY STAR development cycle, separate criteria for sliding glass doors was eliminated and they are now subject to the same criteria as windows. Canada's change is sensible and technically correct. The EPA should follow Canada's lead as to full lite doors.

### **IV. Conclusion**

Lowering the prescriptive U-factor in the north to 0.25 is an important step necessary to ensure that Energy Star Version 6 makes a **real** improvement that will benefit northern consumers. Adding trade-offs to that more stringent 0.25 criteria will ensure that multiple paths exist for manufacturers to comply.

The fact that NRCan is adopting a prescriptive 0.25 U-factor in its most populace zone, a climate zone that significantly overlaps with the northern zone of the U.S., establishes not only that a prescriptive 0.25 U-factor is feasible, but also that it is technically sound and desirable. When NRCan's Energy Star revisions take effect on February 1, 2015, Energy Star labeled windows with a 0.25 U-factor will be readily available on both the Canadian and the U.S. sides of the border. Specifying a prescriptive 0.25 U-factor in NRCan's Energy Star Zone 2 virtually assures that 0.25 U-factor windows will be available for Energy Star labeling in the northern zone of the U.S.

The American Architectural Manufacturers Association (AAMA), Associated Materials, Incorporated, Champion Window Mfg & Supply Co., Jeld-Wen Windows & Door, and the Window and Door Manufacturers Association (WDMA) have all asked that the effective date of Version 6 be extended. If, as in Canada, an extension of the effective date is needed to give industry more time to adapt to a more stringent criteria, then the effective date should be extended as Canada has done. Otherwise, EPA runs the risk that the U.S. Energy Star Program will fall substantially behind Canada in stringency and that the IRC's prescriptive criteria will become more stringent than Version 6, within a few short months of the effective date of Version 6 as currently proposed.

In short, there is no technical, practical or other real impediment to reducing the prescriptive U-factor in the northern zone to 0.25. It will save significantly more aggregate energy in the north than the 0.27 U-factor as currently proposed. EPA should reconsider its 0.27 prescriptive northern U-factor and reduce it to 0.25.



# APPENDIX A

**ENERGY STAR® for Fenestration Products**  
**Revised Proposed Changes to the Canadian Technical Specification**

This is the revised proposal for changing the Canadian ENERGY STAR technical specification for fenestration products. Natural Resources Canada (NRCan) would like to thank all those who commented on our first proposal.

**1. Implementation Date**

A number of comments were received with respect to the proposed implementation date and the number of changes being proposed. Therefore, the new proposed effective date is **February 1, 2015**.

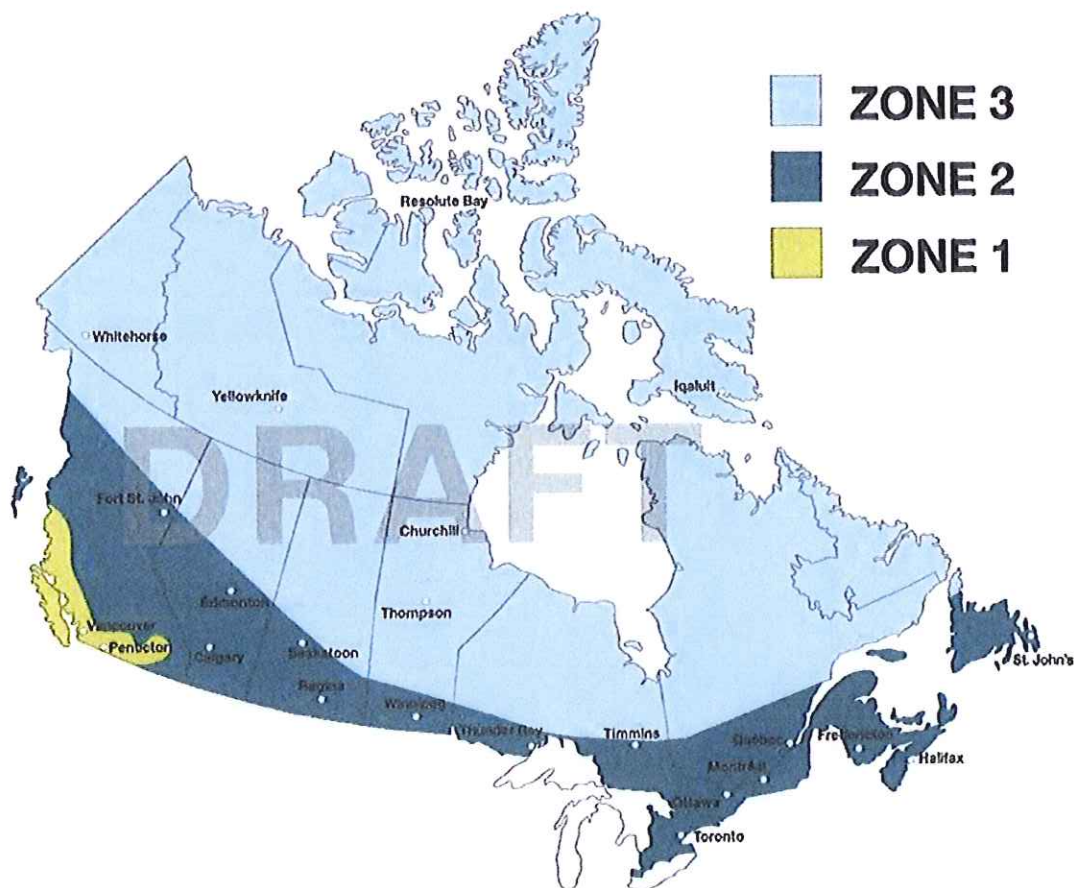
**2. Zone Map**

The proposed new 3 zone map was accepted by almost all of those who submitted comments. The move to using the Heating Degree Day (HDD) values as found in the current edition of the Model National Building Code (MNBC) (See Appendix A) was also accepted.

Zone 1: <3500 HDDs

Zone 2: 3500 to <6000 HDDs

Zone 3: ≥6000 HDDs





### 3. Qualifying Levels

More stringent qualifying levels were generally accepted by stakeholders (see Tables 1 and 2) if the industry was given more time to adapt which NRCan is now proposing to do. The elimination of the U-factor cap in the Energy Rating (ER) compliance path was also generally accepted, therefore, this change will go forward.

A number of negative comments were received about changing the minimum ER values to a minimum SHGC value in the window and door criteria table, therefore this proposal has been dropped. To replace the minimum SHGC value, minimum ER values have been calculated using the maximum U-factor in metric units for each zone, the SHGC value of 0.20 and the air leakage value of 0.5 L/s/m<sup>2</sup>. These minimum ER values are proposed to apply to windows and sliding glass doors only. The minimum ER will not apply to hinged doors, sidelites and door transoms. There was also a suggestion to raise the minimum allowable SHGC to at least 0.25 (or the equivalent ER value), however it is felt at this time that the program needs to allow participants the flexibility of offering at least some lower solar gain products. NRCan will continue to monitor this aspect to see if a higher minimum solar gain value is warranted in the future.

A number of negative comments were also received about the proposal to have U-factors in metric units only in the criteria tables, therefore, NRCan has decided to retain the current Zones B, C and D U-factor metric and imperial values for the new Zones 1, 2 and 3 to maintain consistency.

**Table 1: Energy Efficiency Requirements for Windows and Doors**

Zone	Energy Rating (ER) Path	OR	U-factor Path		
	Minimum ER (Unitless)		Maximum U-factor W/m <sup>2</sup> ·K (Btu/h·ft. <sup>2</sup> ·°F)	AND	Minimum ER Windows and Sliding Glass Doors Only (Unitless)
1	25		1.60 (0.28)		16
2	29		1.40 (0.25)		20
3	34		1.20 (0.21)		24

**Table 2: Energy Efficiency Requirements for Skylights\***

Zone	Maximum U-factor W/m <sup>2</sup> K (Btu/h·ft. <sup>2</sup> ·°F)
1	2.60 (0.46)
2	2.40 (0.42)
3	2.10 (0.37)

\*Levels for tubular skylights under review

A problem has recently been identified in the way U-factor values have been determined for Tubular Daylighting Devices (tubular skylights), therefore, suitable levels for these products are still being evaluated at this time.

#### 4. Other Proposed Changes

##### A. Air Leakage

Both NRCan and the U.S. EPA remain committed to the certification of product performance to maintain the integrity of the ENERGY STAR symbol, therefore, the requirement for certified air leakage values is still being proposed. Manufacturers will be able to submit air leakage results certified by the NFRC or other accredited certification agencies. Certification to a full physical performance standard such as NAFS will be encouraged. Non-certified test results will no longer be accepted as of February 1, 2015 and any models with non-certified test results in the NRCan database will be archived.

NRCan received comments noting that an air leakage rate of  $\leq 2.5$  l/s/m<sup>2</sup> for hinged doors would not meet the Model National Building Code of Canada, therefore, it is now proposed that all fenestration products including hinged doors must have an air leakage of  $\leq 1.5$  l/s/m<sup>2</sup>.

##### B. Installation Instructions

It is currently required that installation instructions be shipped to the end-user along with the product. NRCan is still proposing to amend this requirement so that an electronic version on a company or industry association website will be an acceptable alternative. However, NRCan is no longer proposing to prescribe what details should be included.

Please send all comments on this second proposal to Steve Hopwood, Natural Resources Canada to [shopwood@nrcan.gc.ca](mailto:shopwood@nrcan.gc.ca) or by fax at 613-947-5286 by **January 18, 2013**. For further information on this proposal, you may also contact him at 613-995-6741.



# APPENDIX B



**PUBLIC CODE CHANGE PROPOSAL FORM**  
**FOR PUBLIC PROPOSALS TO THE INTERNATIONAL CODES**  
**2012-2014 CODE DEVELOPMENT CYCLE**

**CLOSING DATES:**

**Group A Codes: January 3, 2012**

**Group B Codes: January 3, 2013**

**Group C Codes: January 6, 2014**

*\*See Item 3 of these instructions for additional information concerning Group A, B and Group C Code Development Committees Responsibilities\**

1)

Name: Thomas S. Zaremba		Date: 1.3.13	
Jurisdiction/Company: Roetzel & Andress			
Submitted on Behalf of: Pilkington North America and AGC Glass Company North America			
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E-mail address (see # 4 below): tzaremba@ralaw.com			

**I. CODE: IRC-12-14**

*Code Sections/Tables/Figures Proposed for Revision (3.3.2); Note: If the proposal is for a new section, indicate (new).*

**Tables R402.1.1 and R402.1.3**

**Proponent: Name/Company/Representing (3.3.1):** (NOTE: DO NOT USE ACRONYMS FOR YOUR COMPANY OR ORGANIZATIONAL NAME)

*Thomas S. Zaremba/Roetzel & Andress/Pilkington North America and AGC Glass Company North America*

**Revise as follows:**



Revise Tables R402.1.1 and R402.1.3 as follows:

TABLE R402.1.1  
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT<sup>a</sup>

CLIMATE ZONE	FENESTRATION U-FACTOR <sup>b</sup>	GLAZED FENESTRATION SHGC <sup>b,e</sup>	SKYLIGHT <sup>b</sup> U-FACTOR	GLAZED FENESTRATION SHGC <sup>b,e</sup>	(remainder of table unchanged)
1	NR	≤ 0.25	0.75	0.25	
2	0.40	≤ 0.25	0.65	0.25	
3	0.35	≤ 0.25	0.55	0.25	
4 except Marine	0.35	≤ 0.40	0.55	0.40	
5 and Marine 4	0.32- 0.25	NR	0.55	NR	
	= 0.26	≥ 0.22			
	= 0.27	≥ 0.27			
	= 0.28	≥ 0.32			
	= 0.29	≥ 0.37			
	= 0.30	≥ 0.42			
6	0.32- 0.25	NR	0.55	NR	
	= 0.26	≥ 0.22			
	= 0.27	≥ 0.27			
	= 0.28	≥ 0.32			
	= 0.29	≥ 0.37			
	= 0.30	≥ 0.42			
7 and 8	0.32- 0.25	NR	0.55	NR	
	= 0.26	≥ 0.22			
	= 0.27	≥ 0.27			
	= 0.28	≥ 0.32			
	= 0.29	≥ 0.37			
	= 0.30	≥ 0.42			

a. R-values are minimums. Except as otherwise noted, U-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed R-value of the insulation shall not be less than the R-value specified in the table.

TABLE R402.1.3  
EQUIVALENT U-FACTORS<sup>a</sup>

CLIMATE ZONE	FENESTRATION U-FACTOR <sup>b</sup>	SKYLIGHT <sup>b</sup> U-FACTOR	(remainder of table unchanged)
1	0.50	0.75	
2	0.40	0.65	
3	0.35	0.55	
4 except Marine	0.35	0.55	
5 and Marine 4	0.32-0.25	0.55	
6	0.32-0.25	0.55	
7 and 8	0.32-0.25	0.55	