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ENERGY STAR® Qualifying Criteria for Residential Windows, Doors and Skylights Sold in Canada Version 2.0 – April 1, 2005

1) DEFINITIONS

a. Window – An assembly that transfers visible light and is designed to be secured in a vertical position within a wall structure in a building envelope.

b. Skylight – An assembly that transfers visible light and is designed to be secured in a sloped position within a roof structure in a building envelope.

c. Door – An assembly that may or may not transfer visible light and is designed to be secured in a vertical position within a wall structure in a building envelope. The primary function of the assembly is to allow human egress.

d. CSA – Canadian Standards Association

e. CGSB – Canadian General Standards Board

f. NFRC – U.S. National Fenestration Rating Council

2) TEST STANDARDS

a. Thermal

CSA A440.2 *Energy Performance of Windows and Other Fenestration Systems*
CSA A453.0* *Energy Performance Evaluation of Swinging Doors*
NFRC 100 *Procedure For Determining Fenestration Product U-factors*
NFRC 200 *Procedure For Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence*
*Except for Energy Rating (ER) calculation – see Appendix 1

b. Structural (for airtightness)

CSA A440.0 *Windows*
CGBS 82.1 *Sliding Doors*
CGSB 82.5 *Insulated Steel Doors*

Canada

3) QUALIFYING LEVELS

Table 1
Windows and Doors

Zone	Heating Degree-Day Range	U-VALUE PATH		OR	ENERGY RATING PATH	
		Maximum W/m²•K (Btu/h•ft²•F)	SHGC		Minimum ER* (dimensionless) (Maximum U-value 2.00 W/m²•K)	
					Windows With Sashes** and Doors	Windows Without Sashes
A	<= 3500	2.00 (0.35)	Any	or	17	27
B	> 3500 to <= 5500	1.80 (0.32)	Any	or	21	31
C	> 5500 to <= 8000	1.60 (0.28)	Any	or	25	35
D	> 8000	1.40 (0.25)	Any	or	29	39

*See Appendix 2 for an explanation of the 2004 ER formula.
**The sash may be integral to the frame. Example: fixed casements.

Table 2
Skylights

Zone	Heating Degree-Day Range	Maximum U-Value* W/m²•K (Btu/h•ft²•F)	SHGC
A	<= 3500	3.10 (0.54)	Any
B	> 3500 to <= 5500	2.80 (0.50)	Any
C	> 5500 to <= 8000	2.60 (0.46)	Any
D	> 8000	2.38 (0.42)	Any

*Skylights must be tested or simulated for their thermal performance in a sloped position of at least 20 degrees.

Notes:

1. For a map of the zones in Canada, see Appendix 3.
2. Windows and sliding glass doors must have an air leakage rate of less than or equal to 1.65 (m^3/h)/m. Skylights and swinging doors are not required to meet an air leakage requirement at this time.
3. ER must be calculated according to the formula found in Appendix 1.
4. ISO 15099 compliant software may be used to calculate thermal performance values.

4) CERTIFICATION REQUIREMENTS

U value and Solar Heat Gain Coefficient (SHGC) values must be certified by the NFRC or an organization accredited for the certification of fenestration products by the Standards Council of Canada (SCC). Certified air tightness values are not required at this time.

5) AIRTIGHTNESS TESTING REQUIREMENTS

Airtightness testing must be done by an independent laboratory that has been accredited for the testing of fenestration products by the SCC or other signatories to the Asia Pacific Laboratory Accreditation Cooperation (APLAC) and/or the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement.

6) INSTALLATION GUIDELINES

Participants are required to include installation guidelines for their products when they are shipped to dealers or end-users.

7) GRANDFATHER CLAUSE

Product models registered with ENERGY STAR Canada before January 1, 2005, that have qualified through the ER compliance path with a U-value greater than 2.00 $W/m^2 \bullet K$ (0.35 $Btu/h \bullet ft^2 \bullet F$) will be delisted effective January 1, 2006. Beginning January 1, 2005, product models registered with ENERGY STAR Canada may not qualify through the ER compliance path with a U-value greater than 2.00 $W/m^2 \bullet K$ (0.35 $Btu/h \bullet ft^2 \bullet F$).

8) FUTURE SPECIFICATION REVISIONS

Natural Resources Canada reserves the right to revise this specification should technological and/or market changes affect its usefulness to consumers, industry or the environment. Any proposed revisions will be discussed with industry and other affected stakeholders.

APPENDIX 1
Energy Rating System (ER)

$ER = 57.76\ SHGC_W - 21.90\ U_W - 0.54\ (L_{75} / A_W) + 40$

$SHGC_W$ = total product solar heat gain coefficient, dimensionless
U_W = total product U-value in $W/(m^2 \cdot K)$
L_{75} = total airflow rate in m^3/h at a pressure difference of 75 Pa
A_W = area in m^2 as per the reference sizes in Table 1.

Table 1
Size Reference

Window Type*	**Width (mm)**	**Height (mm)**
Vertical sliding	1200	1500
Horizontal sliding	1500	1200
Tilt-and-turn	1200	1500
Casement	600	1500
Awning	1500	600
Fixed	1200	1500
Projecting	1500	600
Doorlite (including frame)	575	925
Door Type	**Width (mm)**	**Height (mm)**
Sliding glass door	2000	2000
Door system with a slab of this size.	915	2030

*Includes fixed versions of operable products

APPENDIX 2
Information About the New ER Formula

In the 2004 version of the CSA A440.2 standard, the ER formula underwent the following changes:

1. A 20 percent solar reduction factor was added.
2. A constant factor of 40 was added to make all ER numbers positive.

In addition, window sample sizes were harmonized with the U.S. NFRC standards.

As a result of the changes, the qualifying levels for ENERGY STAR had to be recalculated to match the thermal performance required by the previous version of the ER equation. Table 1 compares the ENERGY STAR zone gateway values for the 2004 version of the standard to the previous 1998 version.

Table 1
ENERGY STAR Qualifying Levels Comparison

Zone	A440.2 - 04	A440.2 - 98
A	17 / 27	-16 / -6
B	21 / 31	-12 / -2
C	25 / 35	-8 / +2
D	29 / 39	-5 / +5

APPENDIX 3
ENERGY STAR ZONE MAP FOR CANADA