



ENERGY STAR Qualified Homes Equivalent Program Requirements For Use in the State of Minnesota

Window Requirements		
Max Window Area ^{1,2}		18%
Window U-value	≤ 0.33	≤ 0.28
Window SHGC	0.35 - 0.50	0.24 - 0.40
Minimum Insulation Requirements		
Attic		R-50
Cathedral Ceiling		R-40
Max % Cathedral Ceiling		50%
Exterior Wall ³		R-24
Slab, perimeter, extending vertically down 4 ft		R-10
Basement Wall		R-19
Floor Over Exterior Space		R-30 + R-5 Sheathing
Floor Over Unconditioned Space		R-30
Minimum Equipment Requirements	Electric Heating	Gas Heating
Furnace Heating(AFUE or HSPF)	(Any)	92%
Electric Cooling (SEER), Right-Sized ⁴	14	14
Active Ventilation Efficiency	76% HRV or ERV	(Any)
Thermostat for forced air systems ⁵	Programmable	Programmable
Thermostat for non-forced air systems	Manual	Manual
Water Heater Requirements (EF)⁸	Electric Heating	Gas Heating
40 gallon	0.93	0.62
50 gallon	0.92	0.59
60 gallon	0.91	0.57
80 gallons or greater	0.89	0.53
Additional Requirements	Electric Heating	Gas Heating
Compliance with Thermal Bypass Checklist? ⁶	Yes	Yes
Infiltration (blower door tested) ⁷	1.5 ACH50	0.35 nach
Duct Location	Condition. Space	(Any)
Duct Insulation	(Any)	R-6
Duct Leakage	n/a	4 cfm/100ft ² CFA
Number of Fluorescent Lighting Fixtures	3	3
ENERGY STAR Dishwasher?	Yes	Yes
ENERGY STAR Refrigerator?	Yes	Yes
Design Limitations		
Total Conditioned Floor Area	1000 - 4000 S.F.	
Window Distribution	<= 62.5% of allowable Maximum Window Area on the North & West	



ENERGY STAR Qualified Homes Equivalent Program Footnotes For Use in the State of Minnesota

1. All decorative glass and skylight window area counts toward the total window area to above-grade conditioned floor area (WFA) ratio. For homes with conditioned basements, the following equation must be used to determine the allowable window area: Allowable Window Area = $18\% \times \text{Total Conditioned Floor Area} \times \text{FA}$, where $\text{FA} = (\text{Above-grade thermal boundary gross wall area}) / (\text{Above-grade thermal boundary gross wall area} + 0.5 \times \text{below-grade thermal boundary gross wall area})$. For example, for a one-story home with a conditioned basement, 1000 sq. ft. of conditioned space per floor, 8' floor to ceiling height, and 6' below grade basement depth, the following window area would be allowed:
 $18\% \times 2000 \text{ sq. ft} \times [(8 \text{ ft} + 2 \text{ ft}) \times \text{house perimeter}] / [(8 \text{ ft} + 2 \text{ ft} + 0.5 \times 6 \text{ ft}) \times \text{house perimeter}] = 277 \text{ sq. ft.}$
2. Up to 0.75% WFA may be used for decorative glass that does not meet ENERGY STAR requirements. For example, a home with total above-grade conditioned floor area of 2,000 sq. ft. may have up to 15 sq. ft. (0.75% of 2,000) of decorative glass.
3. Walls constructed of Insulated Concrete Forms (ICF) or Structurally Insulated Panels (SIP) with a nominal insulation level of at least R-20 may be used in place of the required R-24 wood-frame walls.
4. Cooling equipment shall be sized according to the latest editions of ACCA Manuals J and S, ASHRAE 2001 Handbook of Fundamentals, or an equivalent procedure. Maximum oversizing limit for air conditioners and heat pumps is 15% (with the exception of heat pumps in Climate Zones 5 - 8, where the maximum oversizing limit is 25%). The following operating conditions shall be used in the sizing calculations and verified where reviewed by the rater:

Outdoor temperatures shall be the 99.0% design temperatures as published in the ASHRAE Handbook of Fundamentals for the home's location or most representative city for which design temperature data are available. Note that a higher outdoor air design temperature may be used if it represents prevailing local practice by the HVAC industry and reflects extreme climate conditions that can be documented with recorded weather data; Indoor temperatures shall be 75 F for cooling; Infiltration rate shall be selected as "tight", or the equivalent term.

In specifying equipment, the next available size may be used. In addition, indoor and outdoor coils shall be matched in accordance with ARI standards.

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5. In homes with heat pumps that have programmable thermostats, the thermostat must have "Adaptive Recovery" technology to prevent the excessive use of electric back-up heating.
6. The Thermal Bypass Inspection Checklist must be completed for homes to earn the ENERGY STAR label. The Checklist requires visual inspection of framing areas where air barriers are commonly missed and inspection of insulation to ensure proper alignment with air barriers, thus serving as an extra check that the air and thermal barriers are continuous and complete.
7. Envelope leakage must be determined by a RESNET-certified rater using a RESNET-approved testing protocol.
8. To determine domestic hot water (DHW) EF requirements for additional tank sizes, use the following equations:
Gas DHW EF $\geq 0.69 - (0.002 \times \text{Tank Gallon Capacity})$; Electric DHW EF $\geq 0.97 - (0.001 \times \text{Tank Gallon Capacity})$.



ENERGY STAR Qualified Homes Equivalent Program Energy Savings & Values For Use in the State of Minnesota

Gas Heating Program Requirements

Estimated Monthly Savings and Energy Savings Values											
One Story						Two Story					
Slab-on-grade			Basement			Slab-on-grade			Basement		
1,500	2,500	3,500	1,500	2,500	3,500	2,000	3,000	4,000	2,000	3,000	4,000
\$13	\$18	\$23	\$18	\$23	\$28	\$27	\$37	\$46	\$28	\$37	\$46
\$1,950	\$2,650	\$3,300	\$2,550	\$3,300	\$4,100	\$3,950	\$5,300	\$6,700	\$4,100	\$5,400	\$6,700

Electric Heating Program Requirements

Estimated Monthly Savings and Energy Savings Values											
One Story						Two Story					
Slab-on-grade			Basement			Slab-on-grade			Basement		
1,500	2,500	3,500	1,500	2,500	3,500	2,000	3,000	4,000	2,000	3,000	4,000
\$16	\$29	\$43	\$18	\$33	\$48	\$27	\$43	\$59	\$28	\$44	\$60
\$2,250	\$4,250	\$6,250	\$2,600	\$4,750	\$6,950	\$3,900	\$6,200	\$8,550	\$4,000	\$6,350	\$8,700