WISCONSIN ENERGY STAR HOMES

RESNET Interpretation for Ventilation System Controls

Technical Bulletin #3
Effective Date for All New Homes – January 1, 2008
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OVERVIEW: All rating procedures (weather completed in support of Wisconsin ENERGY STAR Homes certification or verification of the energy threshold requirement for new construction tax credits as defined in the Energy Policy Act (EPACT) are specified by the Residential Energy Services Network (RESNET)[1] organization and are spelled out in Chapter 3 of their Technical Standards[2]. Because Wisconsin Energy Conservation Corporation is a RESNET accredited provider, they are obligated to comply with all sections of the 2006 Mortgage Industry National Home Energy Rating Systems Standards as set forth by RESNET.

HISTORY: Wisconsin ENERGY STAR Homes has always included a 'whole-house' ventilation system requirement as called out in STANDARD 1AQ, as well as spot ventilation called out in STANDARD 2AQ. Builders can specify the equipment and control of their choice, as well as the placement of such, as long as it meets the tested air flow (CFM) performance requirement. A popular choice among participating builders has been a local exhaust fan in a bathroom meeting both the whole-house and spot ventilation requirements. Ventilation should always be a part of every home design, especially in tight construction.

Note: Wisconsin new homes are built very well and blower door testing often shows estimates of natural air change rates well below 0.35 ach.

THE ISSUE: The RESNET specifications in Table 303.4.1(1) limit the building tightness for energy calculation purposes to 0.35 ach unless the home has a 'mechanical ventilation system.' In section 302, RESNET defines a 'mechanical ventilation system' as:

> "A fan designed to exchange the air in the house with outside air, sized to provide whole-house service per **ASHRAE[3] 62.2**[4], and controlled automatically (i.e. not requiring human intervention to turn on and off). The presence of a **remote-mounted on-off switch** or dedicated circuit breaker labeled 'whole house ventilation' (or equivalent) shall not disqualify a system from meeting the requirement of automatic control."

The RESNET Technical Committee also provides formal interpretations of the standards in an effort to help with compliance. **On April 20, 2007** they issued interpretation # **2007-001** which applies to mechanical ventilation system definition **and application**. Under item #3 of 2007-001it reads:

> "Controlled automatically" means the ventilation fan system shall be capable of operating automatically on a continuous or intermittent basis, without occupant intervention, to meet the delivered mechanical ventilation rate requirements of ASHRAE Standard 62.2 2004 Section 4.
>
> a. A thermostat "fan-on" switch by itself (for air handler integrated supply-air systems) or a **locally-mounted on-off switch** (for devices serving as local exhaust appliances as well as whole-house ventilation systems) **do not meet this requirement.**
>
> b. Hard-wired (continuous) devices meet the requirement.

IMPORTANCE: Because reduced infiltration provides significant reductions in **estimated energy consumption** it's important we continue to get credit for tight construction in the software calculations. ENERGY STAR and EPACT compliance both benefit from this infiltration credit and it has been the single biggest factor in achieving compliance especially for EPACT. **The limit on this credit depends on the ventilation system compliance** with all applicable requirements, including RESNET's interpretation.

REQUIRED ACTION: Where a local exhaust fan* is used for both spot **and** whole-house ventilation service, a locally-mounted wall switch by itself will no longer comply with the RESNET requirements due to interpretation **2007-001.**

An additional remote-mounted on-off switch will need to be added to **this type of system.** The most practical solution would be to wire this remote switch in 'parallel' with the wall switch in the room containing this fan. It does not have to be any more complicated than this.

EXAMPLE: You choose to use a **bath fan** for both whole-house **and** spot ventilation. You select a bath fan sized to meet or exceed the required whole-house ventilation rate of **ASHRAE 62.2 table 4.1a**

a. You install a wall switch of your choice in the room with this fan.

b. You install a second (remote-mounted) **on-off** switch (wired in parallel) somewhere outside of that room. It can be mounted anywhere as there is no definition for remote-mounted in the standard.

The 'intent' is that this remote-mounted switch will be the main ventilation switch with the locally-mounted switch being the override control. This switch must be appropriately labeled.

*Any remote-mounted whole-house ventilation system with central control would not be affected by this change but must meet the air flow requirements of ASHRAE table 4.1a.

TABLE 4.1a (I-P)
Ventilation Air Requirements, cfm

Floor Area (ft^2)	Bedrooms				
	0-1	2-3	4-5	6-7	>7
<1500	30	45	60	75	90
1501-3000	45	60	75	90	105
3001-4500	60	75	90	105	120
4501-6000	75	90	105	120	135
6001-7500	90	105	120	135	150
>7500	105	120	135	150	165

EFFECTIVE DATE: As of January 1, 2008 the ASHRAE 62.2[6] Whole-House ventilation rate from table 41.a will become the whole-house ventilation rate for Wisconsin ENERGY STAR Homes STANDARD 1AQ, replacing the current STANDARD. The 62.2 Standard is currently referenced in GUIDELINE 8. This should not be a problem as far as equipment goes as we have already evaluated this scenario. The actual per person rate goes down but there's' an adder for the building's conditioned space[5].

IMPLEMENTATION: All new homes permitted after January 1, 2008 for which a ratings is completed as part of Wisconsin ENERGY STAR Homes certification or verification of the EPACT tax credit threshold are required to comply with the air flow requirements of ASHRAE 62.2 and equipment control interpretation of RESNET in order to receive credit for the energy savings associated with increased air tightness below .35 ach

Wisconsin ENERGY STAR Homes Program standards will be updated in the next reprint to reflect this change.

EXAMPLE: A 3 bedroom 2500 sq/ft WESH home would **currently require** the following whole-house ventilation to comply with STANDARD 1 AQ.
(10 cfm per person) = 3 +1 = 4, x 10 = **40 CFM** minimum tested airflow.

In order to comply with 62.2 the same 3 bedroom 2500 sq/ft home would require the following to comply with the new STANDARD 1AQ.
(7.5 cfm per person) = 3 + 1 = 4 x 7.5 = **30 CFM** plus
(1 cfm per 100 sq/ft conditioned space) = 1 x 25 = **25 CFM**
TOTAL WHOLE HOUSE= 30 + 25 = **55 CFM**

Questions regarding this technical bulletin and compliance with new requirements can be directed to Joe Nagan at 920-766-7578 or Dave Kinyon at 888-509-3247 ext 281. Please do not hesitate to call for help with this certification change notice as it applies to all Wisconsin ENERGY STAR Homes certification and EPACT tax credit verification activity as of the date above.

FOOTNOTES:
1. Residential Energy Services Network- can be found at: http://resnet.us
2. RESNET Technical Standards- spells out all procedures and requirements for completing ratings of new and existing homes
3. ASHRAE- American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. www.ashrae.org
4. 62.2 – the latest national standard for: Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. Replaces 62.89
5. Conditioned space- You may use the floor area that will be used for the sales listing.
6. The RESNET Standards **do not include** by reference the entire content of ASHRAE Standard 62.2