**MINHERS Addendum 53i**

**Equipment Efficiency and Equipment Sizing**

**Date Approved:** October 13, 2020

**Mandatory Compliance Date:** October 13, 2020

**Proponent:**  Software Consistency Committee

**Organization:** RESNET

## Purpose:

## Addendum 53 establishes changes to Standard ANSI/RESNET/ICC 301-2019 for the RESNET HERS by amendment of the MINHERS Section 303.1 which adopts Standard 301 by reference. The changes were proposed by the RESNET Software Consistency Committee to improve consistency in the way accredited software calculates components of the energy use of homes utilized in calculating HERS ratings.

**Amendment:**

***Add new Exception 8 to section 303.1 as follows:***

1. Technical Requirements
   1. Applicable Standards

All RESNET Home Energy Ratings conducted in accordance with this Standard shall comply with the provisions of ANSI/RESNET/ICC 301.

Note:  The RESNET Home Energy Ratings adopt Standards ANSI/RESNET/ICC 301 and ANSI/RESNET/ICC 380 including all of their addenda and normative appendices. See 304 Normative References. Standards 301 and 380 Addenda are effective on the date they are approved by ANSI. The Standards Management Board may establish a Transition Period during which addenda may be used. If a Transition Period is authorized these addenda must be used after a Mandatory Compliance Date designated by the Standards Management Board. If no Transition Period is authorized they must be used beginning on the Mandatory Compliance Date established by the Standards Management Board.

**Exception 1:**

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**:** (Exceptions 1, 2 and 3 are repealed when Addendum 42 becomes mandatory January 1, 2021 and the Exceptions below will be renumbered)

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**Exception 8:** RESNET Home Energy Ratings shall be calculated using the HVAC efficiency and sizing requirements as indicated by the changes to Standard 301 indicated below.

1. 1. Energy Rating Reference Home and Rated Home Configuration.
      1. Residence Specifications. The Energy Rating Reference Home and Rated Home shall be configured and analyzed in the Approved Software Rating Tool as specified by Table 4.2.2(1).

| **Table 4.2.2(1) Specifications for the Energy Rating Reference and Rated Homes** | | |
| --- | --- | --- |
| **Building Component** | **Energy Rating Reference Home** | **Rated Home** |
| Heating systemsp, q | Fuel type: same as Rated Home  Efficiencies:  Electric: Air Source Heat Pump in accordance with Table 4.2.2(1a)  Non-electric Furnaces: natural gas Furnace in accordance with Table 4.2.2(1a)  Non-electric Boilers: natural gas Boiler in accordance with Table 4.2.2(1a)  Capacity: sized in accordance with Section 4.4.3.1.  Installation Quality Grade of Forced-Air HVAC System with Furnace or Heat Pump: configured in accordance with Section 4.2.2.3.1 and modeled in accordance with Section 4.2.2.3.2. | Same as Rated Homeq  Same as Rated Home   Same as Rated Home  Same as Rated Home  Same as Rated Home except not smaller than the Rated Home heating load.r  Same as Rated Home, configured in accordance with Section 4.2.2.3.1 and modeled in accordance with Section 4.2.2.3.2. |
| Cooling systemsp, s | Fuel type: Electric  Efficiency: in accordance with Table 4.2.2(1b)  Capacity: sized in accordance with Section 4.4.3.1.  Installation Quality Grade of Forced-Air HVAC System with Air Conditioner or Heat Pump: configured in accordance with Section 4.2.2.3.1 and modeled in accordance with Section 4.2.2.3.2. | Same as Rated Homes  Same as Rated Home  Same as Rated Home except not smaller than the Rated Home cooling load.r  Same as Rated Home, configured in accordance with Section 4.2.2.3.1 and modeled in accordance with Section 4.2.2.3.2. |

* 1. 2. HVAC Sizing. Manufacturer’s Equipment Performance Ratings shall be corrected for local climate conditions and mis-sizing of equipment.[[1]](#footnote-2) To determine equipment mis-sizing, the heating and cooling capacity shall be selected in accordance with ACCA Manual S based on building heating and cooling loads calculated in accordance with Manual J, 8th Edition, ASHRAE *Handbook of Fundamentals*, or an equivalent computation procedure, using the following assumptions. Where an HVAC system installation Grade II or Grade III occurs, system sizing shall be adjusted accordingly, if necessary to meet the load, to account for capacity losses due to installation quality.
        1. **Energy Rating Reference Home.**
        2. **Rated Home.**
           1. Heat Pump equipment capacity shall be sized to at least equal the larger of the building heating and cooling loads calculated in accordance with these procedures. Heating equipment shall be sized to at least meet the building heating load and cooling equipment shall be sized to at least meet the building cooling load.
     4. Air Source Heat Pumps and Air Conditioners.
        1. For Heat Pumps and Air Conditioners where a detailed, hourly HVAC simulation is used to separately model the compressor and evaporator energy (including part-load performance), the back-up heating energy, the distribution fan or blower energy and crank case heating energy, the Manufacturer’s Equipment Performance Rating (HSPF and SEER[[2]](#footnote-3)) shall be modified ~~as follows~~ to represent the performance of the compressor and evaporator components alone[[3]](#footnote-4)~~: HSPF, corr = HSPF, mfg / 0.582 and SEER, corr = SEER, mfg / 0.941~~. The energy uses of all components, including compressor and distribution fan/blower and crank case heater, shall then be added together to obtain the total energy uses for heating and cooling.

7. Informative References**.**

American National Standards Institute, (ANSI) http://www.ansi.com

Bureau of Labor Statistics, http://www.bls.gov/CPI/#tables

Bureau of Labor Statistics, Table 3A from detailed reports listed at http://www.bls.gov/cpi/cpi\_dr.htm

Cutler, D., Winkler, J., Kruis, N., Christensen, C., and Brandemuehl, M. 2013. *Improved Modeling of Residential Air Conditioners and Heat Pumps for Energy Calculations*. NREL Technical Report. Golden, CO.

Duffie, J.A. and W.A. Beckman, 1980. *Solar Engineering of Thermal Processes*, pp. 381-406, John Wylie & Sons, Inc., New York, NY.

Environmental Protection Agency, http://www.energystar.gov/index.cfm?c=clotheswash.pr\_clothes\_washers

Environmental Protection Agency, http://www.epa.gov/compliance/resources/publications/monitoring/caa/woodstoves/certifiedwood.pdf

Fairey, P., D.S. Parker, B. Wilcox and M. Lombardi. 2004. "Climate Impacts on Heating Seasonal Performance Factor (HSPF) and Seasonal Energy Efficiency Ratio (SEER) for Air Source Heat Pumps." *ASHRAE Transactions*. Atlanta, GA.

International Code Council, <http://www.iccsafe.org>

Residential Energy Services Network, Inc., P.O. Box 4561, Oceanside, CA 92052-4561 (<http://www.resnet.us>)

RESNET, January 2013, *Mortgage Industry National Home Energy Rating Systems Standards.* Residential Energy Services Network, Oceanside CA

1. (Informative Note) Examples: HSPF, SEER and AFUE. [↑](#footnote-ref-2)
2. (Normative Note) For Commercial Variable Refrigerant Flow (VRF) Multi-Split Air Conditioning and Heat Pump Equipment, use IEER in place of SEER. [↑](#footnote-ref-3)
3. (Informative Note) Such approaches are described in Cutler et al. 2011 and Fairey et al. 2004. [↑](#footnote-ref-4)