

## RESNET® Standards Public Comment and Proposed Change Form

### Comment/Explanation\*:

*Include your justification for your proposed change to the draft standard below.*

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RESNET is proposing to establish specific air volume per kBtu of total compressor output capacity for installations in confined spaces. While we understand the intention is to ensure efficient performance of heat pump water heaters (HPWH), we believe that the methodology for determining adequate ventilation is something manufacturers already provide guidance on. Bradford White Corporation (BWC) provides specific guidance for installation of our AeroTherm® HPWH including recommended air space, louvered doors and ducting requirements for installation in small spaces, recommended clearances for servicing and proper air exchange and ambient temperatures for compressor operation. BWC's installation instructions discuss installation for ensuring optimal efficiency. In our research, other manufacturers of HPWHs have similar instructions in their product installation and operation manuals. Many factors influence a heat pump compressor's output capacity rating. The capacity of the compressor only provides one variable of a very complex energy balance equation, and it happens to be the simplest part. To draw a correlation between heating capacity and recommended room volume without a multitude of other assumptions, it may not ensure the desired efficiency ratings which RESNET seeks. Proposing a minimum ventilation standard other than what manufacturers list in their specification sheets, may give designers, architects and installers a false expectation of the HPWH performance once installed. HPWHs may not achieve the product's rated Uniform Energy Factor (UEF) once installed due to several factors including: ambient room temperature, available air volume to exchange heat, occupancy usage patterns, etc. Defining a prescriptive minimum room size and/or ventilation strategy for HPWHs is overly simplistic and does not take into consideration several design factors contributing to performance. A manufacturer that specifies 150 cubic feet per kBtu/h compressor output does not necessarily have a lower performing appliance than a manufacturer that specifies 100 cubic feet per kBtu/h compressor output. Installations must take into account where the intake and exhaust of a HPWH are located, clearances above and surrounding the HPWH for service and air exchange, compressor fan CFM, compressor size, ambient temperature etc. All of these considerations are site specific, product specific, and are largely addressed in manufacturer installation and operation manuals. We recommend RESNET require input of the manufacturers' required ventilation space and method of ventilation (open spaces, ducts, louvered doors, etc.). This would provide clear directions to the HERS rater and not conflict with manufacturers' installation and operation instructions.

Is it RESNET's intention to propose similar rating criteria for split-type heat pump water heaters utilized in multi-family applications? These split-type heat pump water heaters can also be installed indoors (typically equipment rooms) and would be subject to the same considerations influencing a heat pump compressor's output capacity.

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### Proposed Change to the Draft Standard\*

Use “~~strikethrough~~” and “underline” formatting to indicate all proposed changes. Changes must be shown with “~~hard-formatting~~” ~~strikethrough~~ and underline, not “track changes”.

Use a color other than red to indicate proposed changes to the draft.

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### 6. Add new table notee ‘ac’ language

- ac. ~~Where an iHPWH is installed, the rated UEF shall be used to determine the compressor COP if one of the following conditions is met for each water heater:~~
- i. ~~A ducted intake and ducted exhaust is installed and the incoming air is drawn from the same space as the space to which the exhaust is discharged.~~
  - ii. ~~The enclosed space containing the water heater is verified to have a total net free opening area to an adjacent heated or conditioned space of the manufacturer’s installation instructions ~~no less than 75 in<sup>2</sup> per 100 watts of compressor power~~, using any combination of grilles, louvers, door undercuts, or a louvered door. ~~Where the compressor power is not specified by the manufacturer, the total net free opening area shall be no less than 560 in<sup>2</sup>.~~~~
  - iii. ~~The iHPWH is in an enclosed space having a volume equal to or greater than the manufacturer’s installation instructions, 1,000 ft<sup>3</sup> which is within the Conditioned Space Volume of the Dwelling Unit.~~