



## Technical Bulletin: Whole-House Ventilation Rate Responsibilities for Designers, Contractors, and Raters

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Whole-house mechanical ventilation plays a critical role in the ENERGY STAR Single-Family New Homes program. It helps ensure that efficiency is not achieved by sacrificing indoor air quality.

Delivering an effective system is a three-step process that involves the **HVAC designer**, the **HVAC contractor or electrician**, and the **Rater**. This technical bulletin is designed to reinforce the responsibilities of each party with regards to the whole-house ventilation airflow rate.

### Step 1: Designer Responsibilities

The designer must first select a ventilation rate and system that meets the intent of ASHRAE 62.2-2010, 2013, or 2016 and complete Section 2 of the HVAC Design Report:

- In Item 2.1, the designer affirms that ventilation airflow design rate and run-time meet the requirements of ASHRAE 62.2-2010, 2013, or 2016.
- In Item 2.2, the designer documents the airflow rate required for a continuously operating system. That is, one that operates 24 hours per day, 7 days a week. This is the **lowest** possible airflow rate that would meet the standard. Any system that is cycled on and off will require a rate higher than this, and some designers may choose to design a system that exceeds the minimum airflow required by the standard.
- In Item 2.3, the designer documents the airflow rate, run-time per cycle, and cycle time for the specific system they're designing. See Exhibit A for two examples of a system for a 2,000 sq. ft. home with 3 bedrooms that is designed to meet ASHRAE 62.2-2010.

**Exhibit A.** Example system design values for Item 2.3 of the HVAC Design Report

	Airflow Rate (CFM)	Run-Time Per Cycle (Minutes)	Cycle Time (Minutes)
Example 1 – Continuous System	50	60	60
Example 2 – Cycled System	150	20	60

Both examples meet the intent of the standard yet are different in their design intent. Because there are multiple ways to design a compliant system, Item 2.3 is critical for understanding the designer's intent.

- The remaining items in Section 2 detail the system type, controls, sound, efficiency, and air inlet location (if specified) of the system.

## Step 2: HVAC Contractor or Electrician Responsibilities

After the design is complete, and before the Rater can complete their verification tasks, the HVAC contractor or electrician must install the whole-house mechanical ventilation system according to the design.

This should include not only installation of the system and associated ducting, but also adjustment of the run-time controls to align with the design intent.



## Step 3: Rater Responsibilities

Finally, the Rater must verify that key parameters of the installed system fall within specified tolerances relative to the design, as defined in Section 7 of the Rater Field Checklist.

Item 7.1 has caused the most confusion. It first requires the Rater to measure the actual airflow of the system using ANSI / RESNET / ICC Standard 380, and then to compare this measured value with the design airflow documented in Item 2.3 of the HVAC Design Report. The two values must be within either 15 CFM or 15% of each other. See below for the acceptable range of measured airflows for the two designs shown earlier.

**Exhibit B.** Acceptable measured airflows for the example systems in Exhibit A.

	Design Airflow Rate (CFM)	Acceptable Range of Measured Airflows (CFM)	Tolerance Used
Example 1 – Continuous System	50	35 - 65	±15 CFM
Example 2 – Cycled System	150	128 - 173	±15%

Note that Raters are **not** required at this time to check if the design airflow in Item 2.3 complies with ASHRAE 62.2. That's because there are many different acceptable answers, depending on the version of the standard used, the cycle time selected, and whether the designer simply meets or chooses to exceed the minimum airflow required by the standard.

While some Raters may choose to go above and beyond the minimum program requirements, to comply with this item the Rater is only required to measure the actual airflow and ensure that it falls within the specified tolerances relative to the design intent documented in Item 2.3.

## Action Items for Raters

- Keep in mind that it's the designer's responsibility to design a system that is compliant with ASHRAE 62.2.
- While RESNET has recently provided guidance for situations when the Rater cannot measure the ventilation airflow rate for a HERS rating, Raters are **required** to measure the ventilation airflow rate using ANSI / RESNET / ICC Standard 380 for the home to be ENERGY STAR certified.
- Raters do not need to verify that the design airflow rate meets ASHRAE requirements, but must verify that the measured ventilation rate falls within the allowable tolerance relative to the design value from Item 2.3 of the HVAC-D.



## Resources

- For videos demonstrating how to measure ventilation airflow, visit <https://energystar.gov/newhomeshvacvideos>.
- View past ENERGY STAR Homes Technical Bulletins at [https://www.energystar.gov/index.cfm?c=bldrs\\_lenders\\_raters.nh\\_educational\\_resources](https://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_educational_resources).
- Questions? Email us at [energystarhomes@energystar.gov](mailto:energystarhomes@energystar.gov).

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