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Household Range Hoods

AHAM HRH-2-2019



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1111 19th Street NW > Suite 402 > Washington, DC 20036

t 202.872.5955 f 202.872.9354 www.aham.org

PREFACE

The Association of Home Appliance Manufacturers develops standards in accordance with AHAM's "Policy and Procedures Governing Technical Standards" which states:

“AHAM Standards shall be in the best interest, mutually, of consumers who use appliances, the industries which provide and service appliances, and other interested parties. They shall relate to actual use conditions, be technically and scientifically sound”

Use or observance of AHAM standards is voluntary.

This standard contains:

Test procedures that may be applied to any brand or model of household range hoods for measuring performance. Results of tests in accordance with this standard may be publicly stated.

Per NEC 422.6, all appliance products - both major and portable - manufactured or marketed in the United States or Canada to be submitted to an appropriate independent Nationally Recognized Testing Laboratory for inspection and listing in conformance with the safety standards and procedures followed by such laboratories. The relevant standard for range hoods in the US is ANSI/UL 507, "Standard for Safety for Fans", latest edition and relevant standard in Canada is CAN/CSA- C22.2 No. 60335-2-31,

AHAM welcomes comments and suggestions regarding this standard. Any standard may be reviewed and improved as needed. All Standards must be updated or reaffirmed at least every five years. Any interested party, at any time, may request a change in an AHAM standard. Such request should be addressed to AHAM's President, and should be accompanied by a statement of reason for the request and a suggested alternate proposal.

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1. PURPOSE

This standard establishes a uniform, repeatable procedure or standard method for measuring airflow and sound of household range hoods.

The standard methods provide a means to compare and evaluate different brands and models of household range hoods regarding characteristics significant to product use.

The standard methods are not intended to inhibit improvement and innovation in product testing, design or performance.

2. SCOPE

This standard applies to household range hoods as defined in Section 3.

This standard establishes uniform methods for measuring performance and also includes sections on definitions, standard test conditions and instrumentation, standard method for measuring performance and recommendations for safety.

This standard only includes recommended test criteria where necessary to enable tests to be carried out. In addition, recommended performance levels only appear where sufficient technical information is available to include such levels.

3. DEFINITIONS

For the purposes of this standard, please follow the definitions defined in the AHAM Range Hood Certification Procedural Guide where definitions align with HVI 920. :

4. STANDARD TEST CONDITIONS AND INSTRUMENTATION

4.1 Standard Voltage and Frequency. Conduct tests at 120 Volts (V), 60 Hertz (Hz), measured at appliance plug when the range hood is energized.

4.2 Test Area. Test in an area free from direct drafts and maintained at a temperature of 73 ± 9 °F (23 ± 5 °C).

4.3 Instrumentation. Electrical measurements must be accurate to within $\pm 1\%$.

5. STANDARD METHOD FOR MEASURING PERFORMANCE

Note the intention of this document is to locally document the requirements for range hood testing and subsequent ratings. It is based on the requirements in ASHRAE 62.2, clause 7.1. & 7.2(see latest edition). Ratings are noted so the appropriate static pressures are defined.

7.1 Selection and Installation. *Ventilation devices and equipment serving individual dwelling units shall be tested in accordance with ANSI/ASHRAE Standard 51/AMCA 210, Laboratory Methods of Testing Fans for Aerodynamic Performance Rating, and ANSI/AMCA Standard 300, Reverberant Room Method for Sound Testing of Fans, and rated in accordance with the airflow and sound rating procedures of the Home Ventilating Institute (HVI) (HVI 915, Loudness Testing and Rating Procedure; HVI 916, Air Flow Test Procedure; and HVI 920, Product Performance Certification Procedure Including Verification and Challenge). Installations of systems or equipment shall be carried out in accordance with manufacturers' design requirements and installation instructions.*

7.2 Sound Ratings for Fans. *Ventilation fans shall be rated for sound at no less than the minimum airflow rate required by this standard, as noted below. These sound ratings shall be at a minimum of 0.1 in. w.c. (25 Pa) static pressure in accordance with the HVI procedures referenced in Section 7.1*

5.1 Air Flow

Air Flow rating in CFM is based HVI Publication 916 Airflow Test procedure (2015)

1. Fan testing setup should conform to HVI 916-15 Section 6, Test Setups and Diagrams.
2. See the table below for pressures (*alternatives are listed – assure that proper pressure is chosen for the conditions being evaluated*):

Organization	Airflow = 100 cfm @ _____ in. w.g./ wc
ASHRAE (Building Codes)	0.25
ASHRAE A4.2.2 exception	0.1
CEC	0.25/0.1
ENERGY STAR	Working Speed

3. *ASHRAE 62.2 clauses*
 - **A4.2.2** *Existing fans intended for local exhaust only shall be measured consistent with the requirements of Section 5.4.*
 - **Exception:** *If the fan flow rate cannot be measured and fan airflow ratings at 0.25 in. wc (62.5 Pa) are not available, but fan airflow ratings are available for 0.1 in. wc (25 Pa) and the duct sizing requirements of Table 5.3(Latest Edition) can be verified, those ratings may be used, provided they are reduced by 25%.*
 - **5.4 Airflow Measurement.** *The airflow required by this section is the quantity of indoor air exhausted by the ventilation system as installed and shall be measured according to the ventilation equipment manufacturer's instructions, or by using a flow hood, flow grid, or other airflow measuring device at the mechanical ventilation fan's inlet terminals, outlet terminals, or in the connected ventilation ducts.*

- **Exception:** The airflow rating, according to Section 7.1, at a pressure of 0.25 in. wc (62.5 Pa) may be used, provided the duct sizing meets the prescriptive requirements of Table 5.3(Latest edition) or manufacturer’s design criteria
4. For ENERGY STAR rated products, Ducted Range Hoods are tested at working speed as defined in HVI 916.
 - The speed that produces 100 CFM, or the lowest speed above 100 CFM that a range hood can produce, when working on the same duct system as the maximum speed test. Two speed range hoods are required to produce at least 90 CFM.

Informative Note – Possible speed settings include per AHAM PG clause 5.1.8.5.1.....BS (Boost speed), HS (high Speed), MS(Medium Speed), LS (Low speed), WS (working speed)

Informative Note – a basic model may be a design in which the airflow components are the same between a 30 inch and a 36 in hood and the airflow performance is equal.

5.2 Sound Performance

Sound ratings in Sones are per HVI Publication 915 Procedure for Loudness Rating of residential Fan Products (2015).

1. Fan testing setup should conform to HVI 915-15 Section 8, Test Setups.
2. See the table below for pressures (*alternatives are listed – assure that proper pressure is chosen for the conditions being evaluated*):

Organization	Sound measured @ _____ in. w.g. /wc
ASHRAE (Building Codes)	0.25
ASHRAE A4.2.2 exception	0.1
CEC	.25/.1/Working Speed
ENERGY STAR	Working Speed

3. For CEC per Standards Section 150.0(o)1G requires kitchen range hoods to be rated for sound in accordance with Section 7.2 of ASHRAE 62.2, and provides an exception to allow kitchen range hoods to be rated for sound at a static pressure determined at working speed as specified in HVI 916 Section 7.2. The static pressure at working speed may be lower than 0.1 inch w.c.
4. For ENERGY STAR rated products, Ducted Range Hoods are tested at working speed as defined in HVI 916.
 - a. The speed that produces 100 CFM, or the lowest speed above 100 CFM that a range hood can produce, when working on the same duct system as the maximum speed test. Two speed range hoods are required to produce at least 90 CFM.

5.3 Operating Power

Fan Motor electrical values are tested per standard wattage assessment defined in UL 507. Fan motor electrical usage is the only energy consumption considered for the efficacy calculation. Energy used for other fan auxiliaries (eg. Lights sensors, heaters, timers, or night lights) is not included in the determination of fan efficiency....see section 5.1.8.4 in AHAM PG.

5.3.1. Standby Power (Reference Only)

Note – This is currently not a requirement for range hoods but the method is being listed here for reference as there is Microwave combination product that will follow this procedure.. Per the DOE Energy Program - DOE’s test procedures for microwave ovens are prescribed at title 10 of the Code of Federal Regulations (“CFR”) part 430, subpart B, appendix I (“Appendix I”)

6. SAFETY

It is required based on NEC 2017 that range hoods intended for installation in the United States be listed per clause 422.6. This would be accomplished by meeting the safety requirements of Underwriters Laboratories Standard No. 507, "Standard for Safety for Fans", latest edition and range hoods intended for installation in Canada meet the safety requirements of CAN/CSA- C22.2 No. 60335-2-31.

Appendix: For reference only

For CEC (Title 24 – 2019)

- Kitchen range hoods must be rated at a maximum of 3.0 sone at one or more airflow settings greater than or equal to 100 CFM.
- A minimum exhaust airflow of 100 CFM is required for vented kitchen range hoods

For ENERGY STAR (Rev 4.1)

- Maximum Input Power - 75 watts
- Minimum Efficacy Level – 2.8 CFM/W
- Maximum Allowable Sound Level - 2.0 Sones