ENERGY STAR® Program Requirements for Residential Ventilating Fans

Partner Commitments

Following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the manufacture and labeling of ENERGY STAR qualified products. The ENERGY STAR Partner must adhere to the following partner commitments:

Qualifying Products

1. Comply with current ENERGY STAR Eligibility Criteria, which define performance requirements and test procedures for residential ventilating fans. A list of eligible products and their corresponding Eligibility Criteria can be found at www.energystar.gov/specifications.
2. **Prior to associating the ENERGY STAR name or mark with any product**, obtain written certification of ENERGY STAR qualification from a Certification Body recognized by EPA for residential ventilating fans. As part of this certification process, products must be tested in a laboratory recognized by EPA to perform residential ventilating fan testing. A list of EPA-recognized laboratories and Certification Bodies can be found at www.energystar.gov/testingandverification.

Using the ENERGY STAR Name and Marks

3. Comply with current ENERGY STAR Identity Guidelines, which define how the ENERGY STAR name and marks may be used. Partner is responsible for adhering to these guidelines and ensuring that its authorized representatives, such as advertising agencies, dealers, and distributors, are also in compliance. The ENERGY STAR Identity Guidelines are available at www.energystar.gov/logouse.
4. Use the ENERGY STAR name and marks only in association with qualified products. Partner may not refer to itself as an ENERGY STAR Partner unless at least one product is qualified and offered for sale in the U.S. and/or ENERGY STAR partner countries.
5. Provide clear and consistent labeling of ENERGY STAR qualified residential ventilating fans.

    5.1. The ENERGY STAR mark must be clearly displayed on the front/inside of the product, in product literature (i.e., user manuals, spec sheets, etc.), and on the manufacturer's Internet site where information about ENERGY STAR qualified models is displayed.

    5.2. It is also recommended that the mark appear on the product packaging.

Verifying Ongoing Product Qualification

6. Participate in third-party verification testing through a Certification Body recognized by EPA for residential ventilating fans, providing full cooperation and timely responses. EPA/DOE may also, at its discretion, conduct tests on products that are referred to as ENERGY STAR qualified. These products may be obtained on the open market, or voluntarily supplied by Partner at the government's request.

Providing Information to EPA

7. Provide unit shipment data or other market indicators to EPA annually to assist with creation of ENERGY STAR market penetration estimates, as follows:

7.1. Partner must submit the total number of ENERGY STAR qualified residential ventilating fans shipped in the calendar year or an equivalent measurement as agreed to in advance by EPA and Partner. Partner shall exclude shipments to organizations that rebrand and resell the shipments (unaffiliated private labelers).

7.2. Partner must provide unit shipment data segmented by meaningful product characteristics (e.g., type, capacity, presence of additional functions) as prescribed by EPA.

7.3. Partner must submit unit shipment data for each calendar year to EPA or an EPA-authorized third party, preferably in electronic format, no later than March 1 of the following year.

Submitted unit shipment data will be used by EPA only for program evaluation purposes and will be closely controlled. If requested under the Freedom of Information Act (FOIA), EPA will argue that the data is exempt. Any information used will be masked by EPA so as to protect the confidentiality of the Partner.

8. Report to EPA any attempts by recognized laboratories or Certification Bodies (CBs) to influence testing or certification results or to engage in discriminatory practices.

9. Notify EPA of a change in the designated responsible party or contacts within 30 days using the My ENERGY STAR Account tool (MESA) available at www.energystar.gov/mesa.

Performance for Special Distinction

In order to receive additional recognition and/or support from EPA for its efforts within the Partnership, the ENERGY STAR Partner may consider the following voluntary measures, and should keep EPA informed on the progress of these efforts:

- Provide quarterly, written updates to EPA as to the efforts undertaken by Partner to increase availability of ENERGY STAR qualified products, and to promote awareness of ENERGY STAR and its message.
- Consider energy efficiency improvements in company facilities and pursue benchmarking buildings through the ENERGY STAR Buildings program.
- Purchase ENERGY STAR qualified products. Revise the company purchasing or procurement specifications to include ENERGY STAR. Provide procurement officials' contact information to EPA for periodic updates and coordination. Circulate general ENERGY STAR qualified product information to employees for use when purchasing products for their homes.
- Feature the ENERGY STAR mark(s) on Partner website and other promotional materials. If information concerning ENERGY STAR is provided on the Partner website as specified by the ENERGY STAR Web Linking Policy (available in the Partner Resources section of the ENERGY STAR website), EPA may provide links where appropriate to the Partner website.
- Ensure the power management feature is enabled on all ENERGY STAR qualified displays and computers in use in company facilities, particularly upon installation and after service is performed.
- Provide general information about the ENERGY STAR program to employees whose jobs are relevant to the development, marketing, sales, and service of current ENERGY STAR qualified products.
- Provide a simple plan to EPA outlining specific measures Partner plans to undertake beyond the program requirements listed above. By doing so, EPA may be able to coordinate, and communicate Partner's activities, provide an EPA representative, or include news about the event in the ENERGY STAR newsletter, on the ENERGY STAR website, etc. The plan may be as simple as providing a list of planned activities or milestones of which Partner would like EPA to be aware. For example, activities may include: (1) increasing the availability of ENERGY STAR qualified products by converting the entire product line within two years to meet ENERGY STAR guidelines; (2) demonstrating the economic and environmental benefits of energy efficiency through special in-store displays twice a year; (3) providing information to users (via the website and user's manual) about energy-saving features and operating characteristics of ENERGY STAR qualified products; and (4) building awareness of the ENERGY STAR Partnership and brand identity by collaborating with EPA on one print advertorial and one live press event.

- Join EPA's SmartWay Transport Partnership to improve the environmental performance of the company's shipping operations. The SmartWay Transport Partnership works with freight carriers, shippers, and other stakeholders in the goods movement industry to reduce fuel consumption, greenhouse gases, and air pollution. For more information on SmartWay, visit www.epa.gov/smartway.
- Join EPA's Green Power Partnership. EPA's Green Power Partnership encourages organizations to buy green power as a way to reduce the environmental impacts associated with traditional fossil fuel-based electricity use. The partnership includes a diverse set of organizations including Fortune 500 companies, small and medium businesses, government institutions as well as a growing number of colleges and universities. For more information on Green Power, visit www.epa.gov/greenpower.

ENERGY STAR® Program Requirements Product Specification for Residential Ventilating Fans

Eligibility Criteria Version 4.2

Following is the Version 4.2 product specification for ENERGY STAR certified residential ventilating fans. A product shall meet all of the identified criteria to earn the ENERGY STAR.

1) Definitions: Below are the definitions of the relevant terms in this document.

A. Residential Ventilating Fan: A fan whose purpose is to actively supply air to or remove air from the inside of a residence. This includes ceiling and wall-mounted fans, or remotely mounted in-line fans, designed to be used in a bathroom or utility room, supply fans designed to provide air to the indoor space, and kitchen range hoods. Some residential ventilating fans contain a light source for general lighting and/or a night light. Supply fans may also be designed to filter incoming air.

B. In-line Ventilating Fan: A fan designed to be located within the building structure and that requires ductwork on both inlet and outlet. In-line fans with multiple inlet or outlet ports are referred to as “multi-port” in-line fans in this specification; all others are referred to as “single port”.

C. Product Family: A fan model and all models derived from it such that differences between the models are limited to those that do not adversely affect product performance. Acceptable differences in characteristics include, but are not necessarily limited to color, finish, and nameplate.

D. Inch of Water Gauge (w.g.): A traditional unit of pressure used to describe both water and gas pressures. The conventional equivalent of one inch of water is 249.0889 pascal, which is 2.490889 millibars, about 0.036127 pounds per square inch (psi) or about 0.073556 inches (1.86832 millimeters) of mercury. The word "gauge" after a pressure reading indicates that the pressure stated is actually the difference between the absolute, or total, pressure and the ambient air pressure at the time of the reading.

E. Power Consumption: The operation of the fan motor consumes electrical power measured in Watts (W).

F. Sone: An internationally recognized unit of loudness, which simplifies reporting of sound output by translating laboratory logarithmic decibel readings into a linear scale that corresponds to the way people sense loudness. A sone is equal in loudness to a pure tone of 1,000 cycles per second at 40 decibels above the listener’s threshold of hearing.

G. Working Speed: 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.

H. MERV: Minimum Efficiency Reporting Value, developed by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, is a metric to indicate the overall effectiveness of an air filter. Scores range from 1 to 20, and the higher the MERV, the more effective the filter is at capturing airborne particulates.

2) Scope:

A. Included Products: Products that meet the definitions of a Residential Ventilating Fan as specified herein and are intended for residential household use only are eligible for ENERGY STAR certification, with the exception of products listed in Section 2.B. The following product types are eligible: range hoods; in-line (single and multi-port), bathroom, and utility room fans, including ducted and direct-discharge models. Ventilating fans with sensors and timers may

certify under this specification. Residential ventilating fans that certify under this specification may also be appropriate for some light commercial applications, such as the bathroom of a restaurant.

B. Excluded Products: The following product types are not eligible for ENERGY STAR:

i Heat/energy recovery ventilation fans ducted to the ventilated space.
ii Powered attic ventilators (e.g., gable fans).
iii Ventilating fans with heat lamps.
iv Ventilating fans with resistance heating.
v Ventilating fans used for cooling (e.g., whole-house fans) or air circulation.
vi Range hoods intended for commercial cooking equipment.
vii Products incorporating power-consuming features (e.g., fans with voice assistance, audio speakers, UV disinfection, or security cameras) in the active mode or off state which are not related to control of ventilation or illumination.*

This specification does not address passive ventilation of any kind.

*Integral battery packs intended solely for emergency operation of the fan or light source in the event of loss of normal power are considered a feature related to the control of ventilation or illumination so products incorporating them are not excluded for the purposes of ENERGY STAR certification.

3) Certification Criteria:

Partners must ensure that all configurations certified as ENERGY STAR continue to meet the certification criteria through subsequent firmware, software, or other changes to the certified product.

A. Efficacy and Fan Sound Requirements:

Table 1: Criteria for ENERGY STAR Certified Residential Range Hoods*

Input Power (W)	Minimum Efficacy Level (CFM/W)	Maximum Allowable Sound Level (Sones)
≤75	2.8	2.0

*** Note**: At working speed, based on static pressure reference measurement as specified in Section 4.C. of this specification.

Table 2: Criteria for ENERGY STAR Certified Residential Bathroom and In-Line (Single-port and Multi-port) Fans

Product Type	Rated Airflow (CFM) Range	Minimum Efficacy Level (CFM/W)*	Maximum Allowable Sound Level (Sones)*
Bathroom and Utility Room Fans	10 to 89 CFM	2.8	2.0
	90 to 200 CFM	3.5	2.0
	201 to 500 CFM (max speed)	4.0	3.0
In-Line (Single-Port and Multi-Port) Fans	N/A	3.8	N/A
In-Line (Single-Port and Multi-Port) Fans tested with a filter in place (6≤MERV<13)	N/A	3.6	N/A
In-Line (Single-Port and Multi-Port) Fans tested with a filter in place (MERV≥13)	N/A	2.9	N/A

*** Note**: Products will meet requirements at all speeds, based on static pressure reference measurement as specified in Section 4.C. of this specification.

i Efficacy shall be calculated by using airflow and fan motor electrical power values as tested per the requirements of this specification. Fan motor electrical usage is the only energy consumption considered for the efficacy calculation. Energy used for other fan auxiliaries (e.g., lights, sensors, heaters, timers, or night lights) is not included in the determination of fan efficacy.

ii Bathroom and utility room fans, and in-line fans, with three or fewer speeds must be tested and meet the performance criteria at each speed. Fans of this type that have more than three speeds or a rotary speed dial, or similar mechanism that allows for a theoretically infinite number of speeds, must be tested, and meet the applicable efficacy and sound requirements of this specification at their maximum and minimum speeds, and at a speed half-way between them. For example, a fan with a maximum speed of 250 CFM, intermediate of 110 CFM, and minimum of 60 CFM would need to have efficacy at or above 4.0 CFM/W and sound at or below 3.0 Sones at maximum speed, efficacy at or above 3.5 CFM/W and sound at or below 2.0 Sones at intermediate speed, and efficacy at or above 2.8 CFM/W and sound at or below 2.0 Sones at minimum speed.

iii Range hoods must be tested and meet the efficacy and sound requirements of this specification in each possible configuration (e.g., vertical, horizontal) at working speed. The Partner shall report to EPA the efficacy and sound level at each configuration.

B. Warranty: Partner shall provide a minimum one-year warranty for a product to certify for ENERGY STAR.

C. Installed Fan Performance: All certifying ventilating fan models, with the exception of in-line, direct discharge, and range hood models, when measured by industry standard testing procedures at 0.25 in. w.g. static pressure, shall deliver a tested airflow (CFM) greater than or equal to 70% of the tested airflow delivered at 0.1 in. w.g. static pressure for that particular model. For fans with two or more speeds, this requirement applies to high speed only.

D. Optional Reporting: The following may be reported, but is not mandatory for ENERGY STAR certification:

Table 3: Optional Reporting Criteria

Product Type	Reported Metric	Static Pressure Reference Measurements
Bathroom and Utility Room Fans	Sound Level (Sones)	0.25 in w.g.

Note: Sound level at 0.25 inches of water gauge static pressure is not mandatory for ENERGY STAR certification. There is no maximum sound level (sones) associated with this optional reported metric.

F. Significant Digits and Rounding:

i All calculations shall be carried out with directly measured (unrounded) values, except as specified in Section 3F.d., below.

ii Unless otherwise specified below, compliance with specification limits shall be evaluated using directly measured or calculated values without any benefit from rounding.

iii Directly measured or calculated values that are submitted for reporting on the ENERGY STAR website shall be rounded to the nearest significant digit as expressed in the corresponding specification limit.

iv When calculating efficacy for ENERGY STAR certification, fan CFM shall be rounded down to the nearest whole CFM and fan motor electrical power shall be rounded up to three significant digits when wattage is greater than 10 Watts, (e.g., 51.6 Watts, 516 Watts), or two significant digits when wattage is less than 10 Watts (e.g., 5.2 Watts). Watt readings should assume standard air (as defined in AMCA 210-16) and as tested Watts.

4) Test Requirements:

A. Representative models shall be selected for testing per the following requirements:

i For certification of an individual product model, the representative product shall be equivalent to that which is intended to be marketed and labeled as ENERGY STAR.

ii For certification of a Product Family, any model within that Product Family can be tested and serve as the representative model. When submitting Product Families, manufacturers continue to be held accountable for any efficiency claims made about their products, including those not tested or for which data was not reported.

B. When testing residential ventilating fans, the following test methods shall be used to determine ENERGY STAR certification:

Table 4: Test Methods for ENERGY STAR Certification

ENERGY STAR Requirements	Test Method Reference
Airflow Rating (CFM)[1,2]	ANSI/AMCA 210-16 Laboratory Methods of Testing Fans for Aerodynamic Performance Rating **OR** HVI Publication 916 Airflow Test Procedure© (2015)
Sound Rating (Sone)[3]	ANSI/AMCA Standard 300-14 Reverberant Room Method for Sound Testing of Fans and AMCA Publication 311-16 Certified Ratings Program - Product Rating Manual for Fan Sound Performance (spherical sones method only) **OR** HVI Publication 915 Procedure for Loudness Rating of Residential Fan Products© (2015)

Notes:
1. Airflow certification cannot be performed for geometrically similar fans tested at other speeds or sizes.
2. Fan testing setup shall conform to HVI 916-15 Section 6, Test Setups and Diagrams.
3. Fan testing setup shall conform to HVI 915-15 Section 8, Test Setups.

C. Static Pressure Reference Measurements: Ventilating fan performance characteristics such as motor wattage, CFM, and Sones shall be collected at specific static pressures. These reference measurements vary depending upon the fan type and follow *HVI Publication 920 Product Performance Certification Procedure Including Verification and Challenge© (2015)* rating points. The static pressure reference measurements are listed below for each certifying fan type:

Table 5: Static Pressure Reference Measurements

Product Description	Static Pressure Reference Measurements
Products with one duct (e.g., Bathroom and Utility Room Fans)	0.1 in w.g.
	0.25 in w.g. for installed fan CFM measurement and optional sound reporting (not applicable to wattage)
Ducted Range Hoods	Tested at working speed as defined in HVI 916
Direct discharge (non-ducted) products	0.03 in w.g.
In-Line (Single-Port and Multi-Port) Fans	0.20 in w.g. (CFM and wattage only

5) **Inclusion of Installation Instructions and Consumer Recommendations**: Picture diagram-type installation instructions shall be included with each certified ventilating fan. The instructions shall include the following:

- How to properly seal the fan, ducts, and penetrations with caulk or other similar material to create an air-tight path from the ventilated space to the building exterior, or vice versa.
- How to properly install insulation around the fan and/or ducts, as appropriate to fan design, to minimize building heat loss and gain and reduce the potential for condensation.
- Recommended duct size and type.
- The following statement:

  "Ducting has a strong effect on the air flow, noise, and energy use of the fan. Use the shortest, straightest duct routing possible for best performance, and avoid installing the fan with smaller ducts than recommended. Insulation around the ducts can reduce energy loss and inhibit mold growth. Fans installed with existing ducts may not achieve their rated air flow."

6) **Effective Date**: The ENERGY STAR Ventilating Fan specification shall take effect on **October 1, 2015**. To certify as ENERGY STAR, a product model shall meet the ENERGY STAR specification in effect on the model's date of manufacture. The date of manufacture is specific to each unit and is the date on which a unit is considered to be completely assembled.

7) **Future Specification Revisions**: EPA reserves the right to change the specification should technological and/or market changes affect its usefulness to consumers, industry, or the environment. In keeping with current policy, revisions to the specification are arrived at through industry discussions. In the event of a specification revision, please note that the ENERGY STAR certification is not automatically granted for the life of a product model. EPA is planning to further investigate the following topics in future revisions:

   A. EPA understands that the ASHRAE 62.2 Standard has higher static pressure requirements than the current ENERGY STAR specification. To ensure better alignment with industry best practices, EPA will consider pursuing updated static pressure requirements in a future specification revision.

   B. EPA continues to be interested in sound performance at higher external static pressure. EPA is aware of the argument that products installed with six-inch diameter ducting are unlikely to face those higher pressures.

   C. EPA will consider capture efficiency, rather than CFM, as the performance metric for kitchen range hoods in a future specification revision.