



# ENERGY STAR® Program Requirements for Residential Ventilating Fans

## Partner Commitments

### Commitment

The following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the manufacturing of ENERGY STAR qualified residential ventilating fans. The ENERGY STAR Partner must adhere to the following program requirements:

- comply with current ENERGY STAR Eligibility Criteria, defining the performance criteria that must be met for use of the ENERGY STAR certification mark on ventilating fans and specifying the testing criteria for ventilating fans. EPA may, 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 EPA's request;
- comply with current ENERGY STAR Identity Guidelines, describing how the ENERGY STAR logos and name may be used. Partner is responsible for adhering to these guidelines and for ensuring that its authorized representatives, such as advertising agencies, dealers, and distributors, are also in compliance;
- qualify at least one ENERGY STAR qualified ventilating fan model within one year of activating the residential ventilating fans portion of the agreement. When Partner qualifies the product, it must meet the specification (e.g., Tier 1 or 2, if applicable) in effect at that time;
- provide clear and consistent labeling of ENERGY STAR qualified ventilating fans. The ENERGY STAR label 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;
- provide to EPA, on an annual basis, an updated list of ENERGY STAR qualifying ventilating fan models. Once the Partner submits its first list of ENERGY STAR qualified ventilating fan models, the Partner will be listed as an ENERGY STAR Partner. Partner must provide annual updates in order to remain on the list of participating product manufacturers;
- provide to EPA, on an annual basis, unit shipment data or other market indicators to assist in determining the market penetration of ENERGY STAR. Specifically, Partner must submit the total number of ENERGY STAR qualified ventilating fans shipped (in units by model) or an equivalent measurement as agreed to in advance by EPA and Partner. Partner is also encouraged to provide ENERGY STAR qualified unit shipment data segmented by meaningful product characteristics (e.g., capacity, size, speed, or other as relevant), total unit shipments for each model in its product line, and percent of total unit shipments that qualify as ENERGY STAR. The data for each calendar year should be submitted to EPA, preferably in electronic format, no later than the following March and may be provided directly from the Partner or through a third party. The 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;
- notify EPA of a change in the designated responsible party or contacts for residential ventilating fans within 30 days.

56 **Performance for Special Distinction**

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

- 60
- 61 ▪ consider energy efficiency improvements in company facilities and pursue the ENERGY STAR  
62 label for buildings;
- 63
- 64 ▪ purchase ENERGY STAR qualified products. Revise the company purchasing or procurement  
65 specifications to include ENERGY STAR. Provide procurement officials' contact information to  
66 EPA for periodic updates and coordination. Circulate general ENERGY STAR qualified product  
67 information to employees for use when purchasing products for their homes;
- 68
- 69 ▪ ensure the power management feature is enabled on all ENERGY STAR qualified monitors in use  
70 in company facilities, particularly upon installation and after service is performed;
- 71
- 72 ▪ provide general information about the ENERGY STAR program to employees whose jobs are  
73 relevant to the development, marketing, sales, and service of current ENERGY STAR qualified  
74 product models;
- 75
- 76 ▪ feature the ENERGY STAR label(s) on Partner Web site and in other promotional materials. If  
77 information concerning ENERGY STAR is provided on the Partner Web site as specified by the  
78 ENERGY STAR Web Linking Policy (this document can be found in the Partner Resources  
79 section on the ENERGY STAR Web site at [www.energystar.gov](http://www.energystar.gov)), EPA may provide links where  
80 appropriate to the Partner Web site;
- 81
- 82 ▪ provide a simple plan to EPA outlining specific measures Partner plans to undertake beyond the  
83 program requirements listed above. By doing so, EPA may be able to coordinate, communicate,  
84 and/or promote Partner's activities, provide an EPA representative, or include news about the  
85 event in the ENERGY STAR newsletter, on the ENERGY STAR Web pages, etc. The plan may  
86 be as simple as providing a list of planned activities or planned milestones that Partner would like  
87 EPA to be aware of. For example, activities may include: (1) increase the availability of ENERGY  
88 STAR qualified products by converting the entire product line within two years to meet ENERGY  
89 STAR guidelines; (2) demonstrate the economic and environmental benefits of energy efficiency  
90 through special in-store displays twice a year; (3) provide information to users (via the Web site  
91 and user's manual) about energy-saving features and operating characteristics of ENERGY STAR  
92 qualified products; and (4) build awareness of the ENERGY STAR Partnership and brand identity  
93 by collaborating with EPA on one print advertorial and one live press event;
- 94
- 95 ▪ provide quarterly, written updates to EPA as to the efforts undertaken by Partner to increase  
96 availability of ENERGY STAR qualified products, and to promote awareness of ENERGY STAR  
97 and its message.
- 98
- 99



# ENERGY STAR® Program Requirements for Residential Ventilating Fans

## Eligibility Criteria

105  
106

107

108 Below is the product specification (Version 2.1) for ENERGY STAR qualified residential ventilating fans. A  
109 product must meet all of the identified criteria to earn the ENERGY STAR.

110

111 1) **Definitions:** Below is a brief description of a residential ventilating fan and other terms as relevant to  
112 ENERGY STAR.

113

114 A. **Residential Ventilating Fan:** A ceiling, wall-mounted, or remotely mounted in-line fan designed to  
115 be used in a bathroom or utility room, or a kitchen range hood, whose purpose is to move  
116 objectionable air from inside the building to the outdoors. Residential ventilating fans used for  
117 cooling (e.g., whole-house fans) or air circulation are excluded. Heat/energy recovery ventilation  
118 fans ducted to the ventilated space and powered attic ventilators (e.g., gable fans) are excluded,  
119 but may be considered in a future version of this specification. Residential ventilating fans with  
120 heat lamps are excluded from this specification. This specification does not address passive  
121 ventilation of any kind.

122

123 B. **Combination Unit:** A residential ventilating fan that contains a light source for general lighting  
124 and/or a night light.

125

126 C. **In-line Ventilating Fan:** A fan designed to be located within the building structure and requires  
127 ductwork on both intake and exhaust. Those in-line fans with only one intake are referred to as  
128 "single port" in-line fans, while those with multiple intake ports are referred to as "multi-port" in-line  
129 fans in this specification.

130

131 D. **HVI 915, "HVI (Home Ventilating Institute) Loudness Testing and Rating Procedure":** Procedure  
132 used for testing and rating ventilation fan products for sound. This test procedure includes  
133 laboratory requirements and methods for obtaining sound pressure, sound power, and some  
134 values.

135

136 E. **HVI 916, "HVI Airflow Test Procedure":** Airflow test procedure that establishes uniform methods  
137 for laboratory testing of powered residential ventilating equipment for airflow rate. This publication  
138 covers the test equipment, tests of specific HVI classification groups, test reports, and policies for  
139 maintaining the procedure.

140

141 F. **HVI 920, "HVI Product Performance Certification Procedure Including Verification and Challenge":**  
142 Publication that defines and specifies certain aspects of the procedures, covering such points as  
143 the actual testing, the certification process, challenge procedures, and the use of HVI trademark  
144 and labels.

145

146 G. **Inch of Water Gauge (w.g.):** A traditional unit of pressure used to describe both water and gas  
147 pressures. The conventional equivalent of one inch of water is 249.0889 [pascals](#), which is  
148 2.490889 [millibars](#), about 0.036127 pounds per square inch (psi) or about 0.073556 inches  
149 (1.86832 millimeters) of mercury. The word "gauge" after a pressure reading indicates that the  
150 pressure stated is actually the difference between the absolute, or total, pressure and the ambient  
151 air pressure at the time of the reading.

- 152  
153  
154  
155  
156  
157  
158  
159  
160  
161  
162  
163  
164  
165  
166  
167  
168  
169  
170  
171  
172  
173  
174  
175  
176  
177  
178  
179  
180  
181  
182  
183  
184  
185  
186  
187  
188  
189  
190  
191  
192
- H. Light Source: The lighting portion of a combination unit or a range hood. For units using a compact fluorescent or fluorescent lamp, the light source includes the lamp and the ballast.
  - I. Power Consumption: The operation of the fan motor consumes electrical power measured in Watts (W). Under this specification, power used for lights, sensors, heaters, timers, or night lights is not included in the determination of power consumption.
  - J. 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.
  - K. Working Speed: The lowest speed above 100 CFM for a two-speed fan and a low setting above 90 CFM for a multi-speed fan as defined in "*HVI Supplement – Range Hood Working Speed.*"
  - L. ANSI/AMCA 210/ASHRAE 51, "Laboratory Methods of Testing Fans for Aerodynamic Performance Rating": Airflow test standard that establishes uniform methods for laboratory testing of fans and other air-moving devices to determine aerodynamic performance for rating or guarantee purposes in terms of airflow rate, pressure, power, air density, speed of rotation, and efficiency.
  - M. AMCA 211, "Certified Ratings Programme – Product Rating Manual for Fan Air Performance": Publication that prescribes technical procedures and specifications to be used in connection with the AMCA (Air Movement and Control Association) Certified Ratings Program.
- 2) Qualifying Products: In order to qualify as ENERGY STAR, a residential ventilating fan must meet the definition in Section 1A and the specification and testing requirements provided in Sections 3 and 4, below. For the purposes of this specification, residential ventilating fans include the following product types: range hoods, in-line (single and multi-port), and bathroom and utility room; including ducted and direct-discharge models. Ventilating fans with sensors and timers may qualify under this specification. Residential ventilating fans qualifying under this specification can also be used in small commercial applications (e.g., bathroom of a restaurant).
- 3) ENERGY STAR Specification Requirements for Qualifying Products: Only those products described in Section 2 that meet the energy-efficiency criteria outlined in Table 1, below, may qualify for the ENERGY STAR. In addition to these requirements, all qualifying residential ventilating fans must also meet those requirements listed in Sections A-C, as appropriate.

<b>Table 1</b>	
<b>Criteria for ENERGY STAR Qualified Residential Ventilating Fans – Minimum Efficacy Levels</b>	
<b>Airflow (cfm)</b>	<b>Minimum Efficacy Level (cfm/W)*</b>
Range Hoods – up to 500 cfm (max)	2.8
Bathroom and Utility Room Fans – 10 to 80 cfm	1.4
Bathroom and Utility Room Fans – 90 to 130 cfm	2.8
Bathroom and Utility Room Fans – 140 to 500 cfm (max)	2.8
In-Line (single-port & multi-port) Ventilating Fans	2.8

\*Based on static pressure reference measurement as specified in Section 4D of this specification.

193

194  
 195  
 196  
 197  
 198  
 199  
 200  
 201  
 202  
 203  
 204  
 205  
 206

A. Lighting Requirements:

1. Starting October 1, 2006, the following products may qualify as ENERGY STAR:
  - a. Residential ventilating fans with no light source
  - b. Combination unit residential bathroom and utility room ventilating fans having a light source that meets the lighting performance criteria listed in Table 2, below. Residential bath and utility ventilating fans that have lamp sockets that can accept incandescent lamps are excluded.

**Table 2 – Light Source Criteria**

Performance Characteristic	ENERGY STAR Specification
System Efficacy per lamp ballast combination, Lumens Per Watt (LPW) – see notes at end of this table	<p>≥ 46 LPW for all lamp types below 30 total listed lamp Watts.</p> <p>≥ 60 LPW for all lamp types that are ≤ 24 inches and ≥ 30 listed lamp Watts.</p> <p>≥ 70 LPW for all lamp types that are ≥ 24 inches and ≥ 30 listed lamp Watts.</p>
Lamp Start Time	<p>The time needed after switching on the lamp to start continuously and remain lighted must be an average of one second or less.</p> <p>For manufacturers using magnetic ballasts and lamps with integrated electronic starting chips, lamps <u>must</u> be included with the residential ventilating fan when shipped from the factory.</p>
Lamp Life	<p>For residential ventilating fans that are shipped with a lamp, the average rated life of the lamp must be ≥ 10,000 hours.</p> <p>For residential ventilating fans that are not shipped with lamps, a list of lamp types must be provided that would result in the lighting source complying with this specification requirement. This list must be clearly visible to the consumer on the residential ventilating fan packaging. Manufacturers are not required to provide specific lamp manufacturer names and model numbers on the packaging. Rather, generic lamp listings, such as the NEMA or ANSI generic descriptions will suffice.</p>

Color Rendering Index	<p>≥ 80 for compact fluorescent lamps.                  ≥ 75 for linear lamps.</p>
Correlated Color Temperature	<p>For residential ventilating fans that are shipped with a lamp and do not have a <i>rated</i> color temperature of 2,700 Kelvin (K) or 3,000 K (actual measured CCT of 2,700 to 3,000K ± 200K), the packaging should clearly describe the color of the product (cool or warm) and state its intended use.</p> <p>For residential ventilating fans that are not shipped with a lamp, a list of lamp types must be provided that would result in the light source complying with this specification requirement. This list must be clearly visible to the consumer on the residential ventilating fan packaging. Manufacturers are not required to provide specific lamp manufacturer names and model numbers on the packaging. Rather, generic lamp listings such as the NEMA or ANSI generic descriptions will suffice.</p>
Noise	<p>Class A sound rating for electromagnetic and electronic ballasts, outside the fixture. Not to exceed a measured level of 24 dBA when measured in a room with ambient noise no greater than 20 dBA.</p>
Maximum Total Lamp Wattage (excluding night lights)	<p>≤ 50 Watts.</p>
Maximum Night Light Wattage	<p>≤ 4 Watts.</p>

208  
 209  
 210  
 211  
 212  
 213  
 214  
 215  
 216  
 217  
 218  
 219  
 220  
 221  
 222  
 223  
 224  
 225  
 226  
 227  
 228  
 229  
 230

**Notes:**

- Light Source efficacy shall be determined by the following equation:  

$$\text{Light Source efficacy [Lumens per Watt]} = \frac{\text{Measured Lamp Lumens [Lumens]}}{\text{Measured Input Power [Watts]}}$$
- Lamp Lumens: Lamp lumens must be measured using the lamp and ballast that are shipped with the residential ventilating fan.
- Light Source Input Power: Light Source input power must be measured using the lamp and ballast that are shipped with the residential ventilating fan.
- For residential ventilating fans shipped without lamps, efficacy shall be determined by testing at least one of the lamp types listed on the product packaging.
- In some cases, original equipment manufacturers (OEMs) may already offer lamps and ballasts that meet the above criteria. Manufacturers may choose a lamp/ballast combination from the NEMA/ALA matrices at [www.nema.org/lampballastmatrix/](http://www.nema.org/lampballastmatrix/) or data from an ENERGY STAR Platform Letter of Qualification supplied by the OEM.

231  
232  
233  
234  
235  
236  
237  
238  
239  
240  
241  
242  
243  
244  
245  
246  
247  
248

B. Quality Assurance Requirements: To assure the quality of ENERGY STAR qualified residential ventilating fans, the following quality assurance requirements must be met for a fan to earn the ENERGY STAR:

1. Warranty

Partner shall provide a minimum one-year warranty for a product to qualify for the ENERGY STAR.

2. Fan Sound Levels

For most ventilating fan products, fan noise is the most obvious indicator of product quality to the consumer. Table 3, below, provides maximum noise levels allowed for residential bath and utility ventilating fans and range hoods to earn the ENERGY STAR. There is no sound requirement for single or multi-port in-line fans.

<b>Table 3 Criteria for ENERGY STAR Qualified Residential Ventilating Fans – Maximum Allowable Sound Levels</b>	
<b>Airflow (cfm)</b>	<b>Maximum Allowable Sound Level (Sones)*</b>
Range Hoods – up to 500 cfm (max)	2.0**
Bathroom and Utility Room Fans – 10 to 80 cfm	2.0
Bathroom and Utility Room Fans – 90 to 130 cfm	2.0
Bathroom and Utility Room Fans – 140 to 500 cfm (max)	3.0

\* Based on static pressure reference measurement as specified in Section 4D of this specification.

249  
250  
251  
252  
253  
254  
255  
256  
257  
258  
259  
260  
261  
262  
263  
264

3. Installed Fan Performance

All qualifying ventilating fan models, with the exception of in-line and range hood models, when measured by industry standard testing procedures at 0.25 in. w.g. static pressure, shall deliver a rated airflow (cfm) equal to or greater than the following percentages of rated airflow delivered at 0.1 in. w.g. static pressure for that particular model:

<b>Product Category</b>	<b>Rated Airflow (0.25 in. w.g.)</b>
Bathroom and Utility Room Fans – 10 to 80 cfm	60%
Bathroom and Utility Room Fans – 90 to 130 cfm	70%
Bathroom and Utility Room Fans – 140 to 500 cfm	70%

265  
266  
267  
268  
269  
270  
271  
272  
273  
274  
275  
276  
277  
278  
279  
280  
281  
282  
283  
284  
285  
286  
287  
288  
289  
290  
291  
292  
293  
294  
295  
296  
297  
298  
299  
300  
301  
302  
303  
304  
305  
306  
307  
308  
309  
310  
311  
312  
313  
314  
315  
316  
317  
318  
319  
320  
321

- C. Inclusion of Installation Instruction and Consumer Recommendations: Picture diagram-type installation instructions shall be included with each qualified ventilating fan. The instructions shall indicate the following:
1. How to properly seal the fan with caulk or other similar material to inhibit air leakage to the exterior of the thermal envelope of the building.
  2. Recommended ductwork types, elbows (including radii), terminations, sealants, and lengths that will minimize static pressure losses and promote adequate airflow.
  3. Proper installation of vibration deadening materials such as short pieces of flexible duct.
  4. Proper installation of insulation around the fan to minimize building heat loss and gain.

**In-Line Fan (Additional) Installation Instructions:** Manufacturers must include the following information on the in-line product or in product literature:

To ensure quiet operation of ENERGY STAR qualified in-line and remote fans, each fan should be installed using sound attenuation techniques appropriate for the installation. For bathroom and general ventilation applications, at least 8 feet of insulated flexible duct must be installed between the exhaust or supply grille(s) and the fan. For kitchen range hood remote ventilation applications, where metal duct is generally required by code, a metal sound attenuator must be installed between the range hood and the fan.

4) Product Testing: Manufacturers are required to perform tests, according to the requirements included in this Version 2.1 specification, then submit qualifying model information to EPA for approval. **Each qualifying model must be tested to and certified by HVI in accordance with HVI 915, 916, and 920. Test results and certification by ANSI/AMCA 210/ASHRAE 51 and AMCA 211 are alternatively acceptable in place of HVI 916 and 920.** The test results must be reported to EPA using the Residential Ventilating Fan Qualified Product Information (QPI) Form. Manufacturers are required to report fan performance information on the QPI Form using the following units of measure:

- A. Airflow Rating (cfm): The airflow of a residential ventilating fan shall be measured in cubic feet per minute (cfm). The cfm values shall be certified by HVI or AMCA and measured by the method described in HVI 916 or ANSI/AMCA 210/ASHRAE 51, respectively.
- B. Efficacy (cfm/W): The efficacy of the residential ventilating fan shall be expressed in cubic feet per minute per Watt (cfm/W). Manufacturers shall calculate efficacy by using the airflow and fan motor electrical power values certified by HVI or AMCA and described in HVI 916 or ANSI/AMCA 210/ASHRAE 51, respectively. Fan motor electrical usage will be the only energy consumption considered for the efficacy calculation. Energy used for other fan auxiliaries, such as lights, is not included in the determination of fan efficacy.
- C. Sound Rating (sone): The sound output of a residential ventilating fan is measured in sones. The sound ratings shall be certified by HVI, and measured by the method described in HVI 915.
- D. Static Pressure Reference Measurements: Ventilating fan performance characteristics such as motor wattage, cfm, and sones must be reported to EPA at specific static pressures. These reference measurements vary depending upon the fan type and follow HVI 920 rating points. Reference measurements shall be certified by HVI or AMCA and conducted in accordance with HVI 920 or AMCA 211. The static pressure reference measurements are listed below for each qualifying fan type.
  1. Ducted products (products with one duct such as bathroom and utility room fans: 0.1 in. w.g. static pressure
    - a. Partner must also test and report products at 0.25 in. w.g. static pressure for airflow (cfm)



- 322                    b. Partner is not required to test sound levels or wattage at 0.25 in. w.g. static pressure  
323
- 324                    2. Ducted range hoods must be tested at working speed as defined in “HVI Supplement – Range  
325                    Hood Working Speed.”
- 326
- 327                    3. Direct discharge (non-ducted) products: 0.03 in. w.g. static pressure  
328
- 329                    4. In-line ventilating fans: 0.20 in. w.g. static pressure (Wattage and cfm only)  
330
- 331
- 332 5) Effective Date: The date that manufacturers may begin to qualify products as ENERGY STAR under  
333 the Version 2.1 specification will be defined as the *effective date* of this agreement. The ENERGY  
334 STAR Residential Ventilating Fans (Version 2.1) specification shall go into effect on **October 1, 2006**.  
335 Any previously executed agreement on the subject of ENERGY STAR qualified vent fans, shall be  
336 terminated effective September 30, 2006.  
337
- 338                    A. Qualifying and Labeling Products under the Version 2.1 Specification: All products, including  
339 models originally qualified under Version 2.0 with a **date of manufacture** on or after **October 1,**  
340 **2006**, must meet the new Version 2.1 requirements in order to use the ENERGY STAR on the  
341 product or in product literature. The date of manufacture is specific to each unit, and is the date  
342 (e.g., month and year) of which a unit is considered to be completely assembled.  
343
- 344                    B. Elimination of Automatic Grandfathering: EPA does not allow grandfathering under this Version  
345 2.1 specification. **ENERGY STAR qualification is not automatically granted for the life of the**  
346 **product model**. Therefore, any product sold, marketed, or identified by the manufacturing  
347 partner as ENERGY STAR must meet the current specification in effect at that time.  
348
- 349
- 350 6) Future Specification Revisions: ENERGY STAR reserves the right to revise the specification should  
351 technological and/or market changes affect its usefulness to consumers, industry, or the environment.  
352 In keeping with current policy, revisions to the specification are arrived at through industry discussions.  
353  
354  
355  
356  
357