



ENERGY STAR® Program Requirements for Room Air Cleaners

Partner Commitments

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

Certifying Products

1. **Comply with current ENERGY STAR Eligibility Criteria**, which define performance requirements and test procedures for room air cleaners. 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 certification from a Certification Body recognized by EPA for room air cleaners. As part of this certification process, products must be tested in a laboratory recognized by EPA to perform room air cleaner 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 Brand Book, 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 Brand Book are available at www.energystar.gov/logouse.
4. Use the ENERGY STAR name and marks only in association with certified products. Partner may not refer to itself as an ENERGY STAR Partner unless at least one product is certified and offered for sale in the U.S. and/or ENERGY STAR partner countries.
5. Provide clear and consistent labeling of ENERGY STAR certified room air cleaners.
 - 5.1. The ENERGY STAR mark must be clearly displayed on the top/front of the product, in product literature (i.e., user manuals, spec sheets, etc.), on product packaging, and on the manufacturer's Internet site where information about ENERGY STAR certified models is displayed.
 - 5.2. Partner shall adhere to the following product-specific commitments regarding use of the ENERGY STAR certified mark on certified products:
 - 5.2.1. In addition to the ENERGY STAR mark, or instead of the ENERGY STAR mark, **the ENERGY STAR disclaimer label**, available to partners via their [My ENERGY STAR Account \(MESA\)](#), shall be placed on the product packaging of ENERGY STAR certified air cleaners. The disclaimer logo includes the following statement:

“This product earned the ENERGY STAR label by meeting strict energy efficiency guidelines set by the U.S. EPA. Room air cleaners have demonstrated the potential for improving air quality and providing health benefits. EPA does not endorse manufacturer claims regarding the degree to which a specific product will produce healthier indoor air.”

The minimum required dimensions for the vertical and horizontal disclaimer labels are 1.5" x 3.5" and 3.5" x 1.5". The graphic shall be scalable if the partner wishes to enlarge it for larger product packaging surfaces.

- 5.2.2. In addition to the text provided above, the following statement shall be included in the Instruction Manual that is shipped with the certified model and on the partner's Web site.

"The energy efficiency of this ENERGY STAR certified model is measured based on a ratio between the model's CADR for Smoke and the electrical energy it consumes, or CADR/Watt."

The placement of this statement shall be in close proximity to the ENERGY STAR mark and any text describing the ENERGY STAR program and/or certified products.

Verifying Ongoing Product Certification

6. Participate in third-party verification testing through a Certification Body recognized by EPA for room air cleaners, providing full cooperation and timely responses. EPA/DOE may also, at its discretion, conduct tests on products that are referred to as ENERGY STAR certified. 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 certified room air cleaners 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 MESA tool 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 certified 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 certified 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 certified 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 certified 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 certified 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 certified 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 certified 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® Product Specification for Room Air Cleaners

Eligibility Criteria Final Draft Version 2.0

Following is the Final Draft Version 2.0 ENERGY STAR product specification for room air cleaners. A product must meet all of the identified criteria if it is to earn the ENERGY STAR.

1 DEFINITIONS

Below are the definitions of the relevant terms in this document.

A. Room Air Cleaner: An electric appliance with the function of removing particulate matter from the air and which can be moved from room to room.

1. Fan with Filter¹: Air cleaner that operates with an electrical source of power and which contains a motor and fan for drawing air through a filter media.
2. Fan with Electrostatic Plates¹: Air cleaner which operates with a fan and incorporates electrically charged plates or wires to electrostatically collect particulate matter. Such devices may include filter(s).
3. Fan Filter with Ion Generator¹: Air cleaner that incorporates an ion generator in addition to a fan and filter.
4. Ion Generator¹: Air cleaner that incorporates an ion generator only.
5. Hybrid¹: An air cleaner employing a combination of the above definitions of fan with filter, electrostatic plate/wire, and ion generator.
6. Combination Product: An air cleaner that provides an additional principal function, other than actively removing particulate matter from the air, within the same housing, such as a humidifier or dehumidifier.
7. Ozone Generator: A device intended to reduce or eliminate microorganisms within a room solely by means of introducing ozone into the room environment.

Note: EPA revised the definition of combination product to indicate that this is a product that provides another *principal function*, other than actively removing particulate matter from the air. This minor change is intended to prevent confusion because the definition previously used the term *primary function*, which EPA already has defined below.

B. Clean Air Delivery Rate (CADR)¹: The measure of the delivery of contaminant free air, within a defined particle size range, by an air cleaner, expressed in cubic feet per minute (cfm). CADR is the rate of contaminant reduction in the test chamber when the air cleaner is turned on, minus the rate of natural decay when the air cleaner is not running, multiplied by the volume of the test chamber as measured in cubic feet. **Note:** CADR values are always the measurement of an air cleaner performance as a complete system and has no linear relationship to the air movement per se or to the characteristics of any particle removal methodology.

C. Room Air Cleaner Functions:

1. Primary Function: Actively removing particulate matter from the air.
2. Secondary Function: Function that enables, supplements or enhances a primary function. For Room Air Cleaners, Secondary Functions may include network connection, clocks, remote controls, or other programmable functions that may continue to be enabled when the primary function is inactive.

D. Operational Modes:

¹ ANSI/AHAM AC-1-2015

- 45 1. **On Mode:** The condition during which the equipment provides the primary function. Secondary
46 functions may also be enabled.
- 47 2. **Partial On Mode²:** The condition during which the equipment provides at least one secondary
48 function but no primary function. This term encompasses the Standby Mode and Network Mode
49 terms from IEC 62301 Ed. 2.0.
- 50 E. **Product Family:** A group of product models that are (1) made by the same manufacturer, (2) subject
51 to the same ENERGY STAR certification criteria, and (3) of a common basic design. Product models
52 within a family may differ from each other according to one or more characteristics or features that (1)
53 have no impact on product performance with regard to ENERGY STAR certification criteria, and (2)
54 are specified herein as acceptable variations within a product family. For room air cleaners,
55 acceptable variations within a product family include:
- 56 1. Color
57 2. Housing

58 **2 SCOPE**

59 **2.1 Included Products**

- 60 2.1.1 Products that meet the definition of a Room Air Cleaner as specified herein are eligible for
61 ENERGY STAR qualification, with the exception of products listed in Section 2.2. Certified air
62 cleaner models shall produce a minimum 30 CADR for Smoke to be considered under this
63 specification.

64 **2.2 Excluded Products**

- 65 2.2.1 Products that are covered under other ENERGY STAR product specifications are not eligible for
66 certification under this specification. The list of specifications currently in effect can be found at
67 www.energystar.gov/specifications.
- 68 2.2.2 The following products are not eligible for certification under this specification, as defined in
69 Section 1:
70 a. Combination products and
71 b. Ozone generators.

72 **3 CERTIFICATION CRITERIA**

73 **3.1 Significant Digits and Rounding**

- 74 3.1.1 All calculations shall be carried out with actual reported (unrounded) or observed values.
75 Calculated results shall be rounded using the following principles:
- 76 i. CADR and Power (W): According to guidance provided in ANSI/AHAM AC-1-2015.
77 ii. CADR/W: The final value shall be rounded to one decimal place and determined per Section
78 3.3.1.
79 iii. Partial On Mode Power: According to guidance provided in IEC 62301 Ed. 2.0.
80 iv. Ozone Generation: Only the final result of a calculation shall be rounded. Calculated results
81 shall be rounded to the nearest significant digit as expressed in the corresponding
82 specification limit.
- 83 3.1.2 Unless otherwise specified, compliance with specification limits shall be evaluated using exact
84 values without any benefit from rounding.

85 **3.2 General Requirements**

- 86 3.2.1 **UL Safety Requirements for Ozone Emitting Models:** To certify for ENERGY STAR, measured
87 ozone shall not exceed 50 parts per billion (ppb).

² IEC 62542, Environmental standardization for electrical and electronic products and systems - Glossary of terms
ENERGY STAR Program Requirements for Room Air Cleaners – Eligibility Criteria

88 **3.3 On Mode Requirements**

89 3.3.1 CADR/Watt Requirement: To certify for ENERGY STAR, the Rated Smoke CADR divided by the
90 operating power consumption measured during the smoke particle removal test (equal to Smoke
91 CADR / Watt) shall be greater than or equal to the Minimum Smoke CADR/Watt Requirement
92 shown in Table 1.

93 **Table 1: Minimum Smoke CADR/W Requirement**

Smoke CADR Bins	Minimum Smoke CADR/W
$30 \leq \text{CADR} < 100$	1.9
$100 \leq \text{CADR} < 150$	2.4
$\text{CADR} \geq 150$	2.9

94 **Note:** EPA received stakeholder feedback indicating that the Smoke CADR/W criteria for the lowest size
95 bin may cause products sold at a lower price point to be unable to meet the ENERGY STAR criteria. As a
96 result, the selection of labeled products for consumers looking for smaller and less expensive air cleaners
97 may be limited. Due to this feedback and because the lowest size bin had the smallest product pass rate
98 in the Draft 1 data package, EPA reduced the Minimum Smoke CADR/W from 2.1 to 1.9. Stakeholders
99 also shared concern that products with HEPA filters would not be represented in the models meeting the
100 Version 2.0 criteria. In addition to in-store model information received from a partner, EPA conducted its
101 own in-store assessment of models with HEPA filters. In this effort EPA identified 25 base models with a
102 HEPA filter meeting the 99.997% definition. There were 2 of 4 models meeting the Version 2.0 criteria in
103 the first CADR bin, 3 of 7 models in the second, and 2 of 7 in the third CADR bin.

104 EPA took a further step and enhanced this dataset with online research made available to EPA by the
105 ENERGY STAR Retail Products Platform and the Agency's own research. Below are the counts of
106 models for both in-store and online, reflecting the easing of the level for $30 \leq \text{CADR} < 100$ models.

- 107 - 3 of 9 HEPA models in the first CADR bin meet the Version 2.0 criteria
- 108 - 8 of 26 HEPA models in the second CADR bin meet the Version 2.0 criteria
- 109 - 18 of 45 HEPA models in the third CADR bin meet the Version 2.0 criteria

110 In this Final Draft, the levels allow for certification of at least two base models with a HEPA filter in each of
111 the CADR bins that are currently available in brick and mortar stores. Choice is expanded meaningfully by
112 online options as reflected above.

113 Also, EPA clarified that the *rated* Smoke CADR and the *measured* operating power be used to calculate
114 CADR/Watt for each product.

115 **3.4 Partial On Mode Requirements**

116 3.4.1 Measured Partial On Mode Power ($P_{\text{Partial_On}}$) shall be less than or equal to the Maximum Partial
117 On Mode Requirement ($P_{\text{Maximum_Partial_On}}$) as calculated per Equation 1, subject to the following
118 requirements:

- 119 i. For a model that has Wi-Fi network connection capability, the model shall have Wi-Fi network
120 connection enabled during testing and a Partial On Mode Network Connected power
121 allowance ($P_{\text{Network_Connected}}$) defined in Table 2 shall be applied in Equation 1. These models
122 shall be tested with a properly configured wireless network available and connected to the
123 product when testing.

124 **Equation 1: Calculation of Maximum Partial On Mode Power Requirement**

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$$P_{\text{Maximum_Partial_On}} = P_{\text{Base_Allowance}} + P_{\text{Network_Connected}}$$

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Where:

- $P_{Maximum_Partial_On}$ is the Maximum Partial On Mode Power Requirement, in watts;
- $P_{Base_Allowance}$ is the Partial On Mode Base power allowance for all products; and
- $P_{Network_Connected}$ is the Partial On Mode Network Connected power allowance.

Table 2: Partial On Mode Power Allowances

	Partial On Mode Power Allowance (W) for models without Wi-Fi capability	Partial On Mode Power Allowance (W) for models with Wi-Fi capability
$P_{Base_Allowance}$	1.00	1.00
$P_{Network_Connected}$	0	1.00

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Note: EPA received stakeholder feedback that some room air cleaner products with Wi-Fi capability require additional steps upon shipment to properly set up a network connection to the product. In order to clarify how products with Wi-Fi capability should be tested, EPA has decided that products with Wi-Fi capability should be tested with this capability enabled and a network connection properly configured. As a result, all products with Wi-Fi *capability* will be eligible for the 1 W network connected power allowance in Partial On Mode. EPA has also included additional instructions in the testing section below on properly configuring a network connection to improve repeatability.

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3.5 Additional Reporting Requirements

- 3.5.1 Report the filter type shipped with the product and the replacement filter model number.
- 3.5.2 Report the rated and measured CADR for pollen and dust and the measured CADR for smoke per the ANSI/AHAM AC-1-2015 Method of Measuring the Performance of Portable Household Electric Room Air Cleaners.
- 3.5.3 Report the measured operating power in watts for pollen and dust per the ANSI/AHAM AC-1-2015 Method of Measuring the Performance of Portable Household Electric Room Air Cleaners.
- 3.5.4 Report the ozone emissions in parts per billion (ppb) per the UL 867 Ed. 5.0 Electrostatic Air Cleaners.

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Note: EPA is collecting this additional information to be reported on the certified product list to provide consumers with valuable details about the product.

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4 OPTIONAL CONNECTED CRITERIA

- 4.1.1 To be recognized as connected, a room air cleaner shall include the base room air cleaner plus all elements (hardware, software) required to enable communication in response to consumer-authorized energy related commands (not including third-party remote management which may be made available solely at the discretion of the manufacturer).
- 4.1.2 The specific design and implementation of the connected room air cleaner is at the manufacturer's discretion provided it is interoperable with other devices via open communications protocol and enables economical, consumer-authorized third-party access to the functionalities provided for in Section 4.4. The capabilities shall be supported through one or more means, as identified in Section 4.2.2. A product that enables economical and direct, on-premises, open-standards based interconnection is the preferred option for meeting this requirement, but alternative approaches are also acceptable.
- 4.1.3 The product must continue to comply with the applicable product safety standards – the addition of the functionality described below shall not override existing safety protections and functions. The appliance must meet manufacturer's internal minimum performance guidelines, e.g., air cleaning.

165 **4.2 Communications**

166 4.2.1 Open Standards – Communication with entities outside the connected room air cleaner that
167 enables connected functionality (Section 4.4) must use, for all communication layers, standards
168 that are:

- 169 A. Included in the Smart Electric Power Alliance Catalog of Standards, and/or
- 170 B. Included in the NIST Smart Grid framework Tables 4.1 and 4.2, and/or
- 171 C. Adopted by the American National Standards Institute (ANSI) or another well-established
172 international standards organization such as the International Organization for
173 Standardization (ISO), International Electrotechnical Commission (IEC), International
174 Telecommunication Union (ITU), Institute of Electrical and Electronics Engineers (IEEE), or
175 Internet Engineering Task Force (IETF).

176 4.2.2 Communications Hardware Architecture – Communication with entities outside the connected
177 room air cleaner that enables connected functionality (Section 4.4) shall be enabled by any of the
178 following means, according to the manufacturer’s preference:

- 179 A. Built-in communication technology
- 180 B. Manufacturer-specific external communication module(s) and/or device(s)
- 181 C. Open standards-based communication port on the appliance combined with open standards-
182 based communications module
- 183 D. Open standards-based communication port(s) on the appliance in addition to A, B or C,
184 above

185 If option B or C is used, the communication module/device(s) must be easy for a consumer to
186 install and shipped with the appliance, provided to the consumer at the time of sale, or
187 provided to the consumer in a reasonable amount of time after the sale.

188 **4.3 Open Access**

189 4.3.1 To enable interconnection with the product, in addition to Section 4.2.1 that requires open-
190 standards, an interface specification, API or similar documentation shall be made available to
191 interested parties that at a minimum, allows transmission, reception, and interpretation of the
192 following information:

- 193 A. Energy Consumption Reporting specified in Section 4.4 (must include accuracy, units, and
194 measurement interval).

195 **4.4 Energy Consumption Reporting**

196 4.4.1 In order to enable simple, actionable energy use feedback to consumers and consumer
197 authorized energy use reporting to third-parties, the product shall be capable of transmitting
198 energy consumption data via a communication link to energy management systems and other
199 consumer authorized devices, services, or applications. This data shall be representative of the
200 product’s interval energy consumption. It is recommended that data be reported in watt-hours for
201 intervals of 15 minutes or less, however, representative data may also be reported in alternate
202 units and intervals as specified in the product manufacturer’s interface specification or API
203 detailed in Section 4.3.

204 4.4.2 The product may also provide energy use feedback to the consumer on the product itself. On-
205 product feedback, if provided, may be in units and format chosen by the manufacturer (e.g.,
206 \$/month).

207 **4.5 Information to Consumers**

208 4.5.1 If additional modules, devices, services, and/or infrastructure are part of the configuration
209 required to activate the product’s communications capabilities, prominent labels, or other forms of
210 consumer notifications with instructions shall be displayed at the point of purchase and in the
211 product literature. These shall provide specific information on what consumers must do to activate
212 these capabilities (e.g. “*This product has Wi-Fi capability and requires Internet connectivity and a
213 wireless router to enable interconnection with an Energy Management System, and/or with other
214 external devices, systems or applications.*”).

215 **Note:** The connected criteria, that EPA sought comment on separately in a letter released on June 27,
 216 are now included above. EPA received a limited set of comments on its proposal and followed up with
 217 each of the commenters to address questions and learn more about the state of products in regard to
 218 connected functionality. While EPA learned that these criteria are somewhat forward looking, EPA
 219 understands that they provide a level playing field for partners who are interested in providing or
 220 incentivizing this functionality. As such, EPA has maintained the criteria as proposed.

221 **5 TEST REQUIREMENTS**

222 **5.1 Test Methods**

223 5.1.1 Test methods identified in Table 2 shall be used to determine certification for ENERGY STAR.

Table 2: Test Methods for ENERGY STAR Certification	
ENERGY STAR Requirement	Test Method Reference
Cigarette Smoke CADR	ANSI/AHAM AC-1-2015: <i>Method of Measuring the Performance of Portable Household Electric Room Air Cleaners</i>
Measurement of Operating Power	
Ozone Generation	UL 867 Ed. 5.0 <i>Electrostatic Air Cleaners</i>
Measured Partial on Mode Power (<i>P_{Partial_On}</i>)	IEC 62301 Ed. 2.0 <i>Household electrical appliances – Measurement of standby power</i>

224 **Note:** EPA understands that the ANSI/AHAM AC-1-2015 is the most updated version of the test method
 225 and has noted that it should be used as the test procedure to measure Smoke CADR and operating
 226 power. AHAM noted that there is a 2019 revision that should be published soon. EPA plans to reference
 227 the updated 2019 version of the test procedure after it is published and reviewed.

228 **5.2 Additional Test Set-up Instructions**

- 229 5.2.1 When configuring a model for testing to the ANSI/AHAM AC-1-2015 and the IEC 62301 test
 230 methods to determine Cigarette Smoke, Dust, and Pollen CADR, Operating Power, and
 231 Measured Partial On Mode Power, the tester shall:
- 232 i. Install the unit in accordance with manufacturer instructions. Use the manufacturer default
 233 (i.e., as-shipped) configuration for all secondary functions. However, if the model has network
 234 connection capabilities, follow the instructions below.
 - 235 ii. Verify if the unit under test (UUT) has network connection capabilities:
 - 236 a. Network connections should be listed in the user manual or installation instructions.
 - 237 b. If no connections are specified, verify that the Room Air Cleaner does not have
 238 network capabilities by checking for the absence of network settings on the product
 239 (e.g., control panel or product display).
 - 240 iii. If the UUT has Wi-Fi network connection capabilities, the capabilities shall be activated using
 241 any standard or optional hardware provided by the manufacturer³, and the UUT shall be
 242 connected to an active communication link (including wireless Radio Frequency).
 - 243 a. The network shall support the highest and lowest data speeds of the UUT’s network
 244 function. Manufacturer shall specify connection information related to data speed.
 - 245 b. An active communication link is defined as the mechanism for bi-directional data
 246 transfer between the room air cleaner and one or more external applications,
 247 devices, or systems. An active connection is defined as the capability to pass traffic
 248 across the UUT endpoint and test network device endpoint.
 - 249 c. If the UUT is equipped with multiple network capabilities (e.g., Bluetooth, Ethernet,
 250 etc.), ensure a Wi-Fi connection be made and all other capabilities shall remain in
 251 their default, as-shipped configuration (e.g., Bluetooth searching but not connecting).

³ All non-standard networking equipment and gateways need to be provided by the manufacturer (e.g., Zigbee, Zwave, etc.) but Wi-Fi, Bluetooth, and Ethernet can be configured with non-manufacturer provided equipment.

- 252 d. The tester shall configure the address layer of the protocol, taking note of the
253 following:
254 i. Internet Protocol (IP) IP v6 has Neighbor Discovery and will generally
255 configure a limited, non-routable connection automatically.
256 ii. IP can be configured manually or using Dynamic Host Configuration Protocol
257 (DHCP) with an address in the 192.168.xxx.xxx Network Address Translation
258 (NAT) address space if the UUT does not behave normally when autoIP is
259 used. The network shall be configured to support the NAT address space
260 and/or autoIP.
261 e. The UUT shall maintain this live connection to the network for the duration of testing,
262 with the exception of brief lapses (e.g., when transitioning between link speeds).
263 f. Ensure there is a connection to the Wide Area Network (WAN) if required in the
264 manufacturer's instructions. Configure WAN connection according to manufacturer
265 provided network connection requirements, if applicable.
266 g. If the UUT needs to install any software updates, wait until these updates have
267 occurred; otherwise, if it will operate without updates, skip these updates.
268 iv. In the case of a UUT that has no data/network capabilities, the UUT shall be tested as-
269 shipped.

270 **Note:** EPA has included additional instructions for properly configuring a network connection because the
271 IEC 62301 test standard notes that "...care is required to ensure that a properly configured network is
272 available and connected to the product when testing to obtain an accurate measure of power
273 consumption". As a result, EPA wants to ensure that the configuration of a network connection is
274 repeatable from one product to the next and from one testing laboratory to the next. EPA believes these
275 instructions will provide that additional clarity.

276 5.3 Number of Units Required for Testing

277 5.3.1 Representative Models shall be selected for testing per the following requirements:

- 278 i. For certification of an individual product model, the Representative Model shall be equivalent
279 to that which is intended to be marketed and labeled as ENERGY STAR. Because of the
280 inherent statistical variance in counting low density particulate matter particles, manufacturers
281 have the option of testing the unit three times, each time with a new filter. The measured
282 performance (or mean of measured performance) of this unit and of all units sold must be
283 equal to or better than the ENERGY STAR specification requirements:

$$284 \text{CADR}_{\text{Test}} (\text{CADR}_{\text{Test_Mean}}) \geq \text{ENERGY STAR CADR Criteria}$$

$$285 \text{Measured Ozone}_{\text{Test}} (\text{Measured Ozone}_{\text{Test_Mean}}) \leq \text{ENERGY STAR Ozone Criteria}$$

$$286 \text{Measured Partial On Mode Power}_{\text{Test}} (\text{Measured Partial On Mode Power}_{\text{Test_Mean}}) \leq$$

287 ENERGY STAR Maximum Partial On Mode Power Criteria

- 288 ii. For certification of a Product Family, any model within that Product Family can be tested and
289 serve as the Representative Model. Any subsequent testing failures (e.g., as part of
290 verification testing) of any model in the family will have implications for all models in the
291 family.

292 5.3.2 A single unit of each Representative Model shall be selected for testing.

293 6 EFFECTIVE DATE

294 6.1.1 Effective Date: The Version 2 ENERGY STAR Room Air Cleaner specification shall take effect on
295 **July 17, 2020**. To qualify for ENERGY STAR, a product model shall meet the ENERGY STAR
296 specification in effect on the model's date of manufacture. The date of manufacture is specific to
297 each unit and is the date on which a unit is considered to be completely assembled.

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Note: EPA understands that the majority of products tested to the ANSI/AHAM AC-1-2015 test method have Smoke CADR/W data that may be used to recertify a product to the Version 2.0 Specification, potentially without the need to retest the product. However, EPA believes that products that have Wi-Fi network connection will need to be retested and recertified to ensure that the Wi-Fi capability was enabled during testing and that the network connection was properly configured.

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6.1.2 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 ENERGY STAR qualification is not automatically granted for the life of a product model.