ENERGY STAR® Program Requirements for Room Air Cleaners

Partner Commitments

Commitment

The following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the manufacturing of ENERGY STAR qualified room air cleaners. 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 room air cleaners and specifying the testing criteria for room air cleaners. 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 labels 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 room air cleaner model as ENERGY STAR within one year of activating the room air cleaner portion of the agreement. When Partner qualifies the product, it must meet the specification (e.g., Tier 1 or 2) in effect at that time;

- provide clear and consistent labeling of ENERGY STAR qualified room air cleaners. The ENERGY STAR must be clearly displayed on the top/front of the product, on product packaging, 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;

> **Note:** EPA requires the labeling of all ENERGY STAR qualified products according to one or more of the following options, depending on product design and visibility at both the time of sale and over the use of the product: on the product; on product packaging; in product literature; and on the manufacturer's Internet site. The ENERGY STAR has become the national symbol for energy efficiency, recognized by more than 40% of the American public. As such, the ENERGY STAR logo should be placed in an area of high visibility, preferably on top/front of the air cleaner unit, so that the consumer can see that by purchasing and using an ENERGY STAR qualified room air cleaner, they are helping to reduce air pollution.

- provide to EPA, on an annual basis, an updated list of ENERGY STAR qualifying room air cleaners. Once the Partner submits its first list of ENERGY STAR qualified room air cleaner 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 room air cleaners 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;

Note: As noted above, EPA is willing to work through a third party, such as the Association of Home Appliance Manufacturers (AHAM), to obtain room air cleaner shipment data. This data may be masked and provided in an aggregate form so as not to be able to identify specific manufacturer data. This data will not be shared outside of EPA; it is being collected as a tool to gauge the penetration of ENERGY STAR qualified products in the marketplace.

- notify EPA of a change in the designated responsible party or contacts for room air cleaners within 30 days.

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:

- consider energy efficiency improvements in company facilities and pursue the ENERGY STAR for buildings;

- 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;

- ensure the power management feature is enabled on all ENERGY STAR qualified monitors 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 product models;

- feature the ENERGY STAR on Partner Web site and in other promotional materials. If information concerning ENERGY STAR is provided on the Partner Web site as specified by the ENERGY STAR Web Linking Policy (this document can be found in the Partner Resources section on the ENERGY STAR Web site at www.energystar.gov), EPA may provide links where appropriate to the Partner Web site;

- 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, communicate, and/or promote Partner's activities, provide an EPA representative, or include news about the event in the ENERGY STAR newsletter, on the ENERGY STAR Web pages, etc. The plan may be as simple as providing a list of planned activities or planned milestones that Partner would like EPA to be aware of. For example, activities may include: (1) increase the availability of ENERGY STAR qualified products by converting the entire product line within two years to meet ENERGY STAR guidelines; (2) demonstrate the economic and environmental benefits of energy efficiency through special in-store displays twice a year; (3) provide information to users (via the Web site and user's manual) about energy-saving features and operating characteristics of ENERGY STAR qualified products, and (4) build awareness of the ENERGY STAR Partnership and brand identity

by collaborating with EPA on one print advertorial and one live press event;

- 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.

ENERGY STAR® Program Requirements for Room Air Cleaners

Eligibility Criteria
DRAFT 1

Below is the **Draft 1** product specification (Version 1.0) for ENERGY STAR qualified room air cleaners. A product must meet all of the identified criteria if it is to earn the ENERGY STAR.

1) **Definitions:** Below is a brief description of a room air cleaner and other terms as relevant to ENERGY STAR.

   A. Room Air Cleaner: An electric cord-connected, portable appliance with the primary function of removing particulate matter from indoor air. These devices can be further categorized by the following types of room air cleaner technologies:

      1. Mechanical Air Cleaner: An electrical product consisting of a fan-motor assembly, a filter media to collect particles, and a housing. Other mechanical air cleaners may include:

         I Electrostatic Air Cleaner: A mechanical air cleaner having a media filter using static electricity to allow airborne particles to "stick" to the filter.

         II Ionizer: A mechanical air cleaner whose performance is augmented by the inclusion of an ionizing system that generates a stream of electrons into the air to contact particles. The electrons generated typically form a cloud or corona and ground airborne particles that come into contact with it. Ionizing systems, although rare, can also be found supplementing the performance of precipitators or HEPA air cleaners.

         III High Efficiency Particulate Air (HEPA) Air Cleaner: An air cleaner with a dense media filter designed to remove 99.97 per cent of all airborne particles 0.3μ and larger that come into contact with the filter. Typically, HEPA filters are added to mechanical or electrostatic air cleaners, and can be added to an ionizer in special cases.

         IV Ultra Low Penetration Air (ULPA) Air Cleaner: Similar to the HEPA air cleaner, however, the ULPA filter has a higher density. ULPA air cleaners are designed to trap 99.999 per cent of all airborne particles 0.12 μ and larger.

      2. Precipitators or Electrostatic or Electronic Precipitator: An air cleaner that typically performs as both a mechanical air cleaner and ionizer. Typically, within a housing, this product type employs a fan to draw particles into the unit. The particles are often given a negative charge as they pass into the unit and are collected onto a positively charged collection plate within the unit.

      3. Hybrid: An air cleaner embodying one or more of the technologies described above.

      4. Combination Product: An air cleaner that includes a secondary function, other than air cleaning technology, within the same housing such as a humidifier or dehumidifier.

   B. Airflow: The amount of air volume moved by the air cleaner unit measured in cubic feet per minute (CFM). Under this Version 1.0 specification, the CFM value must be tied directly to a Clean Air Delivery Rate (CADR) and measured in accordance with ANSI/AHAM AC-1.

   C. AHAM: Association of Home Appliance Manufacturers.

   D. ANSI Standard C12.10 (multi-part): A series of test protocols recognized by the American National

Standards Institute (ANSI) for measuring the efficiency of a variety of instruments such as watt meters, watt transducers, power meters, and power analyzers intended to measure the electrical power consumption of various products.

E. ANSI/AHAM AC-1-2002: A test protocol for measuring the performance of portable household electric cord-connected room air cleaners. AC-1 measures the delivery of contaminant free air by a room air cleaner in cubic feet per minute (CFM). This public standard was developed under the auspices of AHAM and is recognized by ANSI.

F. Clean Air Delivery Rate (CADR): Within the scope of ANSI/AHAM AC-1-2002, CADR is defined as the measure of the delivery of contaminant free air by a household electric, cord-connected room air cleaner. More technically, CADR represents the rate of contaminant reduction in the test chamber when the unit is turned on, minus the rate of natural decay when the unit is not running, times the volume of the test chamber as measured in cubic feet [**(RCR – RND) * V**]. Each type of contaminant receives a test value which includes: CADR for Dust; CADR for Tobacco Smoke; and CADR for Pollen. **Note:** CADR always measures a unit's performance as a complete system and has no linear relationship to the air movement within the room, or to the characteristics of any particular filter medium.

G. Filter Media: Various porous materials used to separate and remove contaminants from the air. Common filter media range in density from fairly open such as various foams, papers, and felts to very tight such as HEPA (certified to capture 99.97 percent of particles 0.3μ and larger) and ULPA (certified to remove 99.999 percent of particles 0.12μ and larger). Occasionally, less tight media are impregnated with activated carbon to aid in the removal of gases and odors.

H. Pre-filter: A medium intended to protect finer filters or sensitive air-collection systems from large airborne contaminants. Pre-filters tend to extend the useful life of the denser media with which they are often used.

2) Qualifying Products: In order to qualify as ENERGY STAR, a room air cleaner must be covered by one of the definitions in Section 1A and meet the specification requirements provided in Section 3, below. For the purposes of this specification, room air cleaners include mechanical air cleaners (e.g. electrostatic, HEPA, ULPA, ionizers) and precipitators. Combination products and models that do not rely on a fan to draw contaminants to the unit cannot qualify under this Version 1.0 specification at this time. EPA may, however, consider including additional product categories in future versions of the specification based on stakeholder interest.

Note: This Draft 1 specification is based on the ratio of the amount of clean air produced (CADR) to the amount of electricity consumed by a room air cleaner. EPA is advocating the use of the ANSI/AHAM AC-1 test procedure to determine the CADR of an air cleaner model. The AC-1 test is widely accepted by the air cleaner industry as the most effective way to measure the cleaning ability of the product. A product that cannot provide a CADR reading will not be able to meet this specification. EPA is interested in learning more about these non-eligible products to determine how to best measure their cleaning effectiveness.

It is EPA's understanding that while combination products (i.e., an air cleaner with a humidifier or dehumidifier) are tested by AC-1, their performance is measured without the secondary function activated. It is important that when purchasing a product that has earned the ENERGY STAR, the consumer is assured of both the quality and energy efficiency when both functions are activated. Therefore, at this time, these products will not be eligible for ENERGY STAR under this specification given the limited data on their energy performance. **EPA would like to gauge manufacturer interest and preliminary thoughts as to how to incorporate these, and other product types not covered by this Draft in future specification versions.**

3) Energy-Efficiency Specifications for Qualifying Products: Only those products covered by Section 2 that meet the criteria provided below may qualify as ENERGY STAR. To determine if a product

qualifies, its CADR must be measured according to the ANSI/AHAM AC-1-2002 test procedure. The CADR is then divided by the electrical energy consumed in watts; measured according to the protocol included in Section 4, below. For purposes of this specification, CADR for Tobacco Smoke should be used when determining the energy efficiency (CADR/watt) of the room air cleaner. **Note:** An air cleaner model's tested and measured performance may vary by 1 percent of the minimum CADR/watt requirement provided below and still be deemed compliant with this specification.

- Room air cleaner minimum performance requirement: **≥ 2.0 CADR/watt**

Note: The primary objective of ENERGY STAR is to recognize the most energy-efficient products in the marketplace through the use of the ENERGY STAR label. In developing a specification, EPA considers the following criteria:

- Significant energy savings can be realized on a national basis
- Product performance is maintained or enhanced with increased efficiency
- Energy-efficient purchase will be cost-effective
- Energy efficiency can be achieved through several technology options; at least one of which is non-proprietary
- Product energy consumption and performance can be measured and verified with testing
- Labeling would effectively differentiate products and be visible for purchasers

It is not EPA's intention to design a specification that will allow every model to qualify. The performance level provided in this Draft 1 specification is based on CADR and energy usage data submitted to EPA by air cleaner manufacturers during the specification development process and represents approximately the top 25% of this data set. EPA hopes that over time, the percentage of qualified products will increase as ENERGY STAR penetrates the market.

EPA has included a 1% tolerance level to account for the natural variations in test instrumentation and conditions at the time of test measurement. This tolerance would allow products to qualify as ENERGY STAR as long as the measured performance is at least 1.98 CADR/watt.

EPA's decision to use CADR for Tobacco Smoke in order to calculate the CADR/watt performance ratio is based on the following items:

1. CADR pollen readings can be inconsistent. ANSI/AHAM AC-1 recognizes this by allowing a ±25 margin of error, compared to ±10 for dust and smoke.
2. After reviewing available product CADR performance data, EPA found similar CADR values for smoke and dust. It is EPA's understanding that one CADR value would be closely representative of the other.
3. The CADR for Tobacco Smoke is recognized by the U.S. Federal Trade Commission as having a reasonable scientific basis for making high-level performance claims.

Standby Power: EPA is interested in learning more about air cleaner models that continue to consume energy while in standby mode to support secondary consumer features such as clocks, remote controls, and other programmable functions. If applicable, EPA will address standby power associated with room air cleaners in this Version 1.0 specification. At this time, EPA encourages stakeholders to share their expertise on this subject.

EPA is interested in collecting additional energy consumption data to determine if this specification level is feasible and justified based on the above criteria. Interested parties that disagree with the performance level set forth in this Draft 1 specification are encouraged to provide recommended levels of performance.

4) Test Procedure: Manufacturers are required to perform tests, according to the requirements included

in this Version 1.0 specification, then submit qualifying model information to EPA for approval.

A. In performing these tests, partner agrees to measure CADR according to the ANSI/AHAM AC-1 Standard. During the ANSI/AHAM AC-1 test, a watt meter or equivalent measuring instrument shall be used to quantify the energy consumption of the model. The test protocol for measuring energy consumption of the air cleaner is provided below.

B. Test results must be reported to EPA using the Room Air Cleaner Qualifying Product Information (QPI) Form.

Energy Consumption Test Protocol
Purpose: This protocol formalizes the process of testing the electrical energy consumption of room air cleaners.

Conditions of Test: The test described in this protocol should be conducted under the following conditions:

Ambient room-temperature:	70˚ F ± 5˚F [21˚C ± 1.5˚C]
Relative humidity:	0.4 RH ± 0.05 RH
Electrical frequency:	60 Hertz ± 1 Hertz
Voltage:	120 volts ± 1 volt

Conditioning of Room Air Cleaner Unit Before Test: Testers should assure that the subject unit's motor is properly broken in by running the unit, without filters, for 48 hours or according to the motor manufacturer's written instructions.

Testing Instrumentation: Under this Version 1.0 specification, a watt meter, or equivalent measuring instrument, should be used to measure the total watts consumed. The device must conform to ANSI Standard C12.10 or the equivalent.

Test Procedure: In accordance with equipment manufacturer's instructions, connect the test instrument between the power supply and the air cleaner unit under test.

- Turn the air cleaner ON with all settings/options (i.e., filter check indicator, fan control, etc.) set on HIGH. At the same time, be sure that the power-measuring instrument is reset. This step will ensure capture of the full cycle power consumption.
- Adjust the power supply indicator to 120V - 60 Hz.
- Let the unit operate for 20 minutes. Record a reading every two minutes. The average of the 10 readings constitutes the electrical energy consumption by the unit. If necessary, convert the energy measurement into watts, and record wattage consumed.

Note: The current AC-1 test procedure does not include measurement of energy consumption, although total input watts is measured during the CADR test to ensure the air cleaner is working properly. With the assistance of Intertek Testing Services (ITS), AHAM's testing laboratory, EPA has developed a test protocol for measuring energy consumption of a room air cleaner. EPA's intention in drafting a test protocol is to ensure that this measurement is taken in a consistent manner across all laboratories and manufacturers. **All stakeholders are encouraged to review this test protocol and provide comments to EPA.**

5) Effective Date: The date that manufacturers may begin to qualify products as ENERGY STAR will be defined as the *effective date* of the agreement. The ENERGY STAR Room Air Cleaner specification is effective **January 1, 2004**.

Note: EPA is interested in obtaining industry feedback on whether or not the effective date provided above is appropriate. This effective date was chosen to allow manufacturers time to test and qualify products as ENERGY STAR for a possible product launch at the March 2004 International Housewares Show. The effective date represents the date in which manufacturers may qualify, label, and promote air cleaners as ENERGY STAR.

6) 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 stakeholder 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.** To carry the ENERGY STAR, a product model must 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.