



ENERGY STAR® Program Requirements for Air Source Heat Pumps (ASHPs) and Central Air Conditioners

DRAFT 1 Eligibility Criteria

Below is the **DRAFT 1** specification for ENERGY STAR qualified central air conditioners and air source heat pumps. A system must meet all of the identified criteria if it is to be labeled or characterized as ENERGY STAR.

1) **Definitions:** Below are brief descriptions of residential ASHPs and central air conditioners and other terms as relevant to ENERGY STAR.

- A. Air-Source Heat Pump (ASHP): An air-source unitary heat pump model consists of one or more factory-made assemblies which normally include an indoor conditioning coil(s), compressor(s), and outdoor coil(s), including means to provide a heating function. ASHPs shall provide the function of air heating with controlled temperature, and may include the functions of air-cooling, air-circulation, air-cleaning, dehumidifying or humidifying.
- B. Central Air Conditioner: A central air conditioner model consists of one or more factory-made assemblies which normally include an evaporator or cooling coil(s), compressor(s), and condenser(s). Central air conditioners provide the function of air-cooling, and may include the functions of air-circulation, air-cleaning, dehumidifying or humidifying.
- C. Single Package: A single package unit is an ASHP or central air conditioner that combines both condenser and air handling capabilities in a single casing. Air is treated at a central location and carried to and from the rooms in a house by one or more fans and a system of ducts.
- D. Split System: A split system is an ASHP or central air conditioner with separate indoor (evaporator) and outdoor (condenser) units. Air is treated at a central location and carried to and from the rooms in a house by one or more fans and a system of ducts. For split systems, the energy-efficiency ratings of a particular split system model are based on one of the following: 1) the condenser-evaporator combination that is the partner's most commonly sold combination for that condenser, or 2) the actual condenser-evaporator coil combination of the split system model.
- E. Gas/Electric Package Unit: A single package unit with gas heating and electric air conditioning that is often installed on a slab or a roof. Air is treated at a central location and carried to and from the rooms in a house by one or more fans and a system of ducts.
- F. Heating Seasonal Performance Factor (HSPF): This is a measure of a heat pump's energy efficiency over one heating season. It represents the total heating output of a heat pump (including supplementary electric heat) during the normal heating season (in Btu) as compared to the total electricity consumed (in watt-hours) during the same period. HSPF is based on tests performed in accordance with ARI 210/240.
- G. Seasonal Energy Efficiency Ratio (SEER): This is a measure of equipment energy efficiency over the cooling season. It represents the total cooling of a central air conditioner or heat pump (in Btu) during the normal cooling season as compared to the total electric energy input (in watt-hours) consumed during the same period. SEER is based on tests performed in accordance with ARI 210/240.
- H. Energy Efficiency Ratio (EER): This is a measure of the instantaneous energy efficiency of cooling equipment. EER is the steady-state rate of heat energy removal (e.g., cooling capacity) by the equipment in Btuh divided by the steady-state rate of energy input to the

equipment in watts. This ratio is expressed in Btuh per watt (Btuh/watt). EER is based on tests performed in accordance with ARI 210/240.

- 2) **Qualifying Products:** In order to qualify as ENERGY STAR, an ASHP or central air conditioner must meet the definition in Section 1 and the specification requirements provided in Section 3, below.
- A. **ASHPs:** This agreement shall cover residential ASHPs that are rated below 65,000 Btuh and powered by single-phase current. The ASHP may be a single packaged system, where there is only one assembly, or a split system where there are two. If such equipment is provided in more than one assembly, matched assemblies shall be used in meeting the specifications outlined in Section 3 below.
 - B. **Central Air Conditioners:** This agreement shall cover residential central air conditioners that are rated below 65,000 Btuh, and powered by single-phase current. The central air conditioner may be a single packaged system, where there is only one assembly, or a split system where there are two. If such equipment is provided in more than one assembly, matched assemblies shall be used in meeting the specifications outlined in Section 3 below.
 - C. **Gas/Electric Package Units:** This agreement shall cover gas/electric package units that are rated below 65,000 Btuh. To qualify for the ENERGY STAR label, they must meet the cooling portion of the single package specification outlined in Section 3 below.
- 3) **Energy-Efficiency Specifications for Qualifying Products:** Only those systems listed in Section 2 with a limited warranty that also meet the criteria below qualify as ENERGY STAR.

Energy-Efficiency Criteria for Qualified Residential ASHPs and Central Air Conditioners			
Product Type	SEER	EER	HSPF (for heat pumps only)
Split Systems	≥ 14	≥ 12	≥ 8.5
Single Package Equipment (including gas/electric package units)	≥ 14	≥ 11	≥ 8.0
Installation Criteria for Qualified Residential ASHP and Central Air Conditioner Systems (Effective January 1, 2007)			
<ul style="list-style-type: none"> • Equipment sized according to Manual J¹ (or equivalent) • For split systems, installed system is a matched assembly • Air flow and refrigerant charge verified by an independent third-party to meet manufacturer's specifications 			

Note: In January 2006, the Federal standard for central air conditioners and ASHPs will increase to 13 SEER. As a result, the ENERGY STAR specification should be updated to capture energy savings beyond the standard in a way that is cost effective for consumers and maintains product performance. However, because of the new standard, the marginal benefit to consumers of selecting higher SEER equipment will be less than in the past. In contrast, potential benefits from improving installation of HVAC systems are large, on the order of 10 to 20 percent savings on heating and cooling costs. Numerous field studies have shown that more than half of CAC/ASHP systems are installed with incorrect refrigerant charge and/or airflow. As such, EPA proposes eligibility criteria that address both equipment efficiency and requirements for proper installation.

¹ Air Conditioning Contractors of America. Manual J[®]. 2002. *Residential Load Calculation*. Eighth Edition.

Note Continued: While there are other elements of installation that are important (e.g., ducts), EPA is proposing to only require that sizing, air flow and refrigerant charge be addressed in the context of this draft specification and that only air flow and refrigerant charge be verified by an independent party. EPA is very interested in any stakeholder suggestions on how to verify sizing in a practical manner. Should you have these suggestions, please forward them to EPA along with any other comments on this draft specification. Lastly, EPA is proposing that for split systems, only matched condenser unit and evaporator coil assemblies as installed can qualify for ENERGY STAR under this specification.

In September 2004, EPA distributed an “Options Document” to stakeholders asking for feedback on various options for equipment criteria, installation criteria, and verification methods. This Draft 1 specification reflects the comments received, while simultaneously presenting a streamlined approach to addressing the same three elements. It is EPA’s intention to design a specification that could allow for current quality installation programs to continue under the ENERGY STAR umbrella, while also leaving open opportunities for innovation in the marketplace. In short, any entity may partner with EPA under the partnership agreement and serve as a verification body: utility, manufacturer, retailer, trade association, etc. For example, verification may be done by a utility via an on-site inspection, by a manufacturer or retailer, using a remote access system, or by a trade association via a contractor accreditation program. Any of these options and others may be acceptable to EPA, however, they each must be approved by EPA before the ENERGY STAR label appears on any of the resulting installations.

EPA received several comments on the “Options Document” suggesting alternative energy-efficiency criteria, such as adjusting the EER level of split systems to 11.5 to accommodate equipment of higher tonnage. Although it is true that there are fewer high tonnage model combinations available, which meet the energy efficiency criteria, EPA feels that it is practical to leverage existing sources of equipment performance data. Therefore, EPA has decided to retain the energy-efficiency criteria as previously presented to ensure a continued data source (the CEE Directory of ARI Verified Equipment), as well as continued support for ENERGY STAR by efficiency program sponsors already engaged in promoting either high efficiency equipment and proper installation practices, or just proper installation. EPA anticipates that as manufacturers adjust to both a new Federal standard and a new ENERGY STAR level, additional equipment will be developed that can meet the energy efficiency criteria at all tonnages. EPA does not feel that creating an additional, and potentially duplicative, data source specifically for ENERGY STAR qualified equipment is justified.

- 4) **Testing Requirements:** Qualification for the energy efficiency criteria contained in this specification will be based on testing performed in compliance with Federal Regulations. It is EPA’s intention that Partners will utilize the CEE Directory of ARI Verified Equipment to determine which equipment qualifies for ENERGY STAR.

Note: EPA does not plan to independently develop a list of qualifying products. Instead, Partners will be encouraged to use the CEE Directory of ARI Verified Equipment to determine which model combinations meet the energy-efficiency criteria for qualified residential ASHPs and central air conditioners.

- 5) **Effective Date:** The date that central air conditioners and air source heat pump systems may begin to qualify as ENERGY STAR will be defined as the *effective date* of the agreement. The proposed effective date for the energy-efficiency criteria portion of this specification is **January 26, 2006**. The proposed effective date for the installation criteria of this specification is **January 1, 2007**.

Note: *In order to allow time for potential Partners to develop program plans that address the eligibility criteria for installation, EPA proposes that this portion of the specification become effective January 1, 2007. Efficiency programs with equipment rebates (but not installation verification) may use the new ENERGY STAR performance criteria as a platform for their equipment requirements until January 1, 2007. Existing installation verification programs may use ENERGY STAR as a platform before January 1, 2007; however, program plans should be submitted to EPA for review as soon as possible.*

Manufacturers may continue to use the ENERGY STAR logo on equipment that meets the energy-efficiency criteria contained in this draft specification until January 1, 2007. However, starting January 26, 2006, manufacturers should phase out ENERGY STAR labeling of equipment and any use of the logo in marketing materials that may be inappropriate based on the equipment and installation criteria contained in this specification (i.e., between January 26, 2006 and January 1, 2007, the label may only be used by manufacturers in association with products meeting the new equipment specification). As of January 1, 2007, manufacturers may no longer use the ENERGY STAR logo in association with ASHP/central air conditioning equipment based on equipment performance alone. Should a manufacturer choose to continue their ENERGY STAR Partnership under this new specification by including an approved verification program, they may use the ENERGY STAR logo and messaging consistent with the terms outlined above and in the Partner Commitments section of this document.

- 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 qualify with the energy efficiency criteria of 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.