



ENERGY STAR® Program Requirements for Air Source Heat Pump (ASHP) and Central Air Conditioner Equipment

Revised FINAL DRAFT Eligibility Criteria

Below is the **REVISED FINAL DRAFT** specification (Version 4.0) for ENERGY STAR qualified central air conditioner and air source heat pump equipment. Equipment 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.
- D. Split System: A split system is an ASHP or central air conditioner with separate indoor (evaporator) and outdoor (condenser) units. For split systems, the energy-efficiency rating of a particular split system is based on the actual condenser-evaporator coil combination of the split system.
- E. Gas/Electric Package Unit: A single package unit with gas heating and electric air conditioning that is often installed on a slab or roof.
- 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 210/240¹.
- 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.

¹ Air-Conditioning and Refrigeration Institute. Standard 210/240 "2003 Standard for Unitary Air-Conditioning and Air-Source Heat Pump Equipment."

- I. **Matched Assembly:** A matched assembly is a model combination that is listed in the ARI Directory of Certified Equipment or for which the manufacturer has published energy efficiency data that includes rated SEER and EER levels, and in which both the condenser unit and evaporator coil are installed simultaneously. A matched assembly shall also include the air handler, furnace, or other component that is used to determine the rating according to 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 specification 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 specification 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 specification shall cover gas/electric package units that are rate 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.

TIER 1 Energy-Efficiency Criteria for Qualified Residential ASHPs and Central Air Conditioners			
Product Type	SEER	EER	HSPF (for heat pumps only)
Split Systems	≥ 14	≥ 11.5	≥ 8.2
Single Package Equipment (including gas/electric package units)	≥ 14	≥ 11	≥ 8.0

TIER 2 Energy-Efficiency Criteria for Qualified Residential ASHPs and Central Air Conditioners			
Product Type	SEER	EER	HSPF (for heat pumps only)
Split Systems	≥ 14.5	≥ 12	≥ 8.2
Single Package Equipment (including gas/electric package units)	≥ 14	≥ 11	≥ 8.0

Note: Due to issues raised regarding lack of precision required by current EER rating procedures, EPA concluded that delaying the 12 EER requirement is appropriate. ARI and equipment manufacturers have recently instituted a verification effort that will improve the quality of the EER ratings for the systems listed in the ARI Directory over the next few years. Therefore, EPA deemed it appropriate to adjust the EER criteria for split systems to 11.5 in the short term while instituting a Tier 2 of 14.5 SEER/12 EER to be effective in 2009 (see below, section 5 Effective Date). Industry experts have suggested that systems could be expected to be optimized at this higher level if given adequate notice. Approximately one year before Tier 2 becomes effective, EPA will assess the performance level presented in this specification to ensure its feasibility in the marketplace.

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89 4) **Testing Requirements:** Manufacturers are required to perform tests and self-certify those product
90 models that meet the ENERGY STAR guidelines. Partner agrees to perform energy-efficiency tests
91 for residential ASHPs, central air conditioners, and gas/electric package units under rating conditions
92 in accordance with ARI 210/240. For EER, manufacturers agree to perform energy-efficiency test
93 based on ARI Standard 210/240-94, Operating Condition A: 95°F outdoor air temperature, 80°F dry
94 bulb/67°F wet bulb indoor coil air entering conditions. The HSPF and SEER ratings shall be identical
95 to the levels reported on the Federal Trade Commission (FTC) Energy guide Label.

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97 It is EPA's intention to utilize the CEE Directory of ARI Verified Equipment to determine which
98 equipment qualifies for ENERGY STAR. Any manufacturers that do not participate in the ARI
99 certification program will be expected to submit product information directly to EPA for listing on the
100 www.energystar.gov web site.

Note: EPA does not plan to independently develop a complete list of qualifying products. Instead, stakeholders will be encouraged to use the CEE Directory of ARI Verified Equipment, assuming it is updated in a way consistent with the new ENERGY STAR specification, or some alternative database provided through ARI, to determine which model combinations meet the energy-efficiency criteria for qualified residential ASHPs and central air conditioners. Any manufacturers that do not participate in the ARI certification program will be expected to submit product information directly to EPA for listing on the www.energystar.gov web site.

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102 5) **Effective Date:** The date that central air conditioners and air source heat pump equipment may begin
103 to qualify as ENERGY STAR under the Version 4.0 specification will be defined as the *effective date*
104 of the agreement. Any previously executed agreement on the subject of ENERGY STAR qualified
105 ASHP and central air conditioner equipment shall be terminated effective March 31, 2006.
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107 A. **Qualifying and Marketing Products under Tier 1 of the Version 4.0 specification:** Tier 1 of the
108 Version 4.0 specification shall commence on **April 1, 2006**. All equipment, including model
109 combinations originally qualified under Version 3.0, with a **date of manufacture** on or after **April**
110 **1, 2006**, must meet the new Tier 1 Version 4.0 requirements in order to qualify for ENERGY STAR
111 (including additional shipments of model combinations originally qualified under Version 3.0). The
112 date of manufacture is specific to each unit, and is the date on which a unit is considered to be
113 completely assembled.
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115 B. **Qualifying and Marketing Products Under Tier 2 of the Version 4.0 Specification:** The second
116 phase of this specification, Tier 2, shall commence on **January 1, 2009**. All equipment including
117 model combinations originally qualified under Tier 1 Version 4.0 specification, with a date of
118 manufacture on or after **January 1, 2009**, must meet Tier 2 Version 4.0 requirements in order to
119 qualify for ENERGY. Approximately one year before Tier 2 becomes effective, EPA will assess
120 the performance level presented in this specification to ensure its feasibility in the marketplace.
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122 C. **Elimination of Automatic Grandfathering:** EPA will not allow grandfathering under this Version 4.0
123 ENERGY STAR specification. **ENERGY STAR qualification under Version 3.0 is not**
124 **automatically granted for the life of the products model combination.** Therefore any model
125 combination sold, marketed, or identified by the manufacturing partner as ENERGY STAR must
126 meet the current specification in effect at the time of manufacture of the equipment.

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- 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.