



**ENERGY STAR<sup>®</sup> Light Commercial HVAC Program**  
**Draft Specification Document**  
**Version 1.0**  
**June 27, 2000**



The symbol for energy efficiency.

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Below is the draft product specification for the ENERGY STAR Light Commercial HVAC Program. Please note that the primary focus of this initiative is cooling efficiency; EPA reserves the right to address heating efficiency at some later date and will coordinate with industry, as appropriate.

Per the requirements of the ENERGY STAR Program, a product must meet all of the identified criteria if it is to be qualified as ENERGY STAR compliant by its manufacturer.

- 1) Definitions: Below is a brief description of light commercial HVAC equipment and common measures of efficiency applicable to the ENERGY STAR Program.
  - A. Central Air Conditioner: A central air-conditioner model consists of one or more factory-made assemblies that 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. For the purposes of this Program, both split system (i.e., a system with components located both inside and outside of a building) and single package units (i.e., a system that has all components completely contained in one unit) rated at 65,000 Btu/h or up to 250,000 Btu/h are eligible for the ENERGY STAR label. In addition, three-phase equipment rated below 65,000 Btu/h may qualify according to the specifications in Section 3.
  - B. Heat Pump: A heat pump model consists of one or more factory-made assemblies that normally include an indoor conditioning coil(s), compressor(s), and outdoor coil(s), including means to provide a heating function. Heat pumps 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. For the purposes of this Program, both split system and single package units rated at 65,000 Btu/h or up to 250,000 Btu/h are eligible for the ENERGY STAR label. In addition, three-phase equipment rated below 65,000 Btu/h may qualify according to the specifications in Section 3.
  - C. Cooling Capacity: The cooling capacity is the quantity of heat in BTU (British Thermal Units) that an air conditioner or heat pump is able to remove from an enclosed space during a one-hour period.
  - D. Energy Efficiency Ratio (EER): EER is a measure of efficiency in the cooling mode that represents the ratio of total cooling capacity (Btu/hour) to electrical energy input (Watts). EER will be calculated according to the test procedure listed in Section 4.
  - E. Coefficient of Performance (COP): COP is a measure of efficiency in the heating mode that represents the ratio of total heating capacity (Btu) to electrical input (also in Btu). COP will be calculated according to the test procedure in Section 4.

- F. Integrated Part-Load Value (IPLV): IPLV is a measure of part-load performance for an air conditioner or heat pump. IPLV will be calculated according to the test procedure in Section 4.
- G. Seasonal Energy Efficiency Ratio (SEER): SEER 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 will be calculated according to the test procedure in Section 4.
- H. Heating Seasonal Performance Factor (HSPF): HSPF 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 will be calculated according to the test procedure in Section 4.
- 2) Qualifying Products: For the purposes of this Program, light commercial HVAC equipment includes the following: air-source air conditioners, water-source air conditioners, air-source heat pumps, and water-source heat pumps. As mentioned above, both split system and single package units rated at 65,000 Btu/h or up to 250,000 Btu/h are eligible for the ENERGY STAR label under this Program. As its used primarily in commercial settings, three-phase equipment rated below 65,000 Btu/h may also qualify for the label.
- 3) Energy-Efficiency Specifications for Qualifying Products: Products outlined in Tables 1 and 2 below may qualify as ENERGY STAR compliant. Please note that where applicable products must meet both the EER and IPLV specifications in order to be labeled as ENERGY STAR compliant.

**Table 1: DRAFT ENERGY STAR Light Commercial Air Conditioner Specifications**

Equipment Type	Size Category	Draft Specifications	Test Procedure
Air-Source Air Conditioner (3 phase)	<65,000 Btu/h	≥12 SEER	ARI 210/240
Air-Source Air Conditioner	≥65,000 Btu/h – <135,000 Btu/h	≥11.0 EER; 11.4 IPLV	ARI 210/240
Air-Source Air Conditioner	≥135,000 Btu/h – ≤250,000 Btu/h	≥10.8 EER; 11.2 IPLV	ARI 340/360
Water-Source Air Conditioner	≥65,000 Btu/h – <135,000 Btu/h	≥12.5 EER	ARI 210/240
Water-Source Air Conditioner	≥135,000 Btu/h – ≤250,000 Btu/h	≥12.5 EER	ARI 340/360

**Table 2: DRAFT ENERGY STAR Light Commercial Heat Pump Specifications**

Equipment Type	Size Category	Draft Specifications	Test Procedure
Air-Source Heat Pump	<65,000 Btu/h	≥12 SEER; 7.6 HSPF	ARI 210/240
Air-Source Heat Pump	≥65,000 Btu/h – <135,000 Btu/h	≥11.0 EER (11.4 IPLV); 3.4 COP	ARI 210/240
Air-Source Heat Pump	≥135,000 Btu/h – ≤250,000 Btu/h	≥10.2 EER (11.2 IPLV); 3.3 COP	ARI 340/360
Water-Source Heat Pump	≥65,000 Btu/h – <135,000 Btu/h	≥14.0 EER; 4.6 COP	ISO 13256-1

*EPA Comments: After reviewing the Consortium for Energy Efficiency's (CEE) High Efficiency Commercial Air-Conditioning and Heat Pump Initiative, EPA has decided to model its ENERGY STAR Program after CEE's. As such, the definitions, program scope (i.e., qualifying products), and specifications are similar to CEE Tier II. Please note that the ENERGY STAR and CEE specifications differ in a few areas. Less stringent specifications have been proposed by ENERGY STAR for water-source air conditioners (both size categories) and air-source heat pumps ( $\geq 135,000$  Btu/h –  $\leq 240,000$  Btu/h) because 1) there aren't any models in these categories that meet the Tier II levels today, and 2) EPA hopes less aggressive specifications will seem more attainable to industry and thus spur R&D investments in improving the energy efficiency of future designs. In addition, the specifications for three-phase equipment are identical to the current ENERGY STAR specifications for single-phase equipment (covered under the Residential HVAC Program) and therefore are lower than CEE's Tier II.*

- 4) Test Procedure: The manufacturer shall perform energy-efficiency tests, or have tests performed by outside testing labs, as necessary, to determine which products comply. Based on the results of these tests, the manufacturer shall self-certify those products that it determines are compliant with the specifications outlined above. Light commercial air conditioners and heat pumps shall qualify under rating conditions in accordance with ARI 210/240, ARI 340/360, or ISO 13256-1, as appropriate. The test procedure for each equipment type and size category is provided in Tables 1 and 2 of Section 3.
- 5) Other Information: The *final* version of the ENERGY STAR Light Commercial HVAC agreement will include all of the requirements for manufacturer participation. In addition to product specifications, other issues will be addressed, such as the following:
  - Buyer Information: In keeping with the spirit of the ENERGY STAR Program, the manufacturer will be expected to ensure that consumers have a quick and easy method of determining which of its products are ENERGY STAR compliant. To achieve this goal, EPA recommends that the manufacturer place the ENERGY STAR logo on all qualified product models, their packaging, and product-related materials such as brochures, manuals, advertisements, and Web sites. Further, to educate consumers about energy efficiency and its benefits, the manufacturer will provide one or more of the following: a description of the ENERGY STAR Program, a discussion of the energy-saving characteristics of the product, a description of the environmental benefits that result from the energy saved by the product, and/or a description of the potential energy-bill savings of the product. The manufacturer may determine the best manner to disseminate this educational information to customers (e.g., Web sites and brochures) such that it complements the manufacturer's existing strategy for promotional and informational materials. Upon request, EPA will review text prepared by manufacturers to ensure accuracy prior to printing and/or distribution.
  - Effective Date: The date that manufacturers may begin to qualify products as ENERGY STAR compliant will be defined as the *effective date* of the specifications. EPA proposes an effective date of January 1, 2001.
  - Future Specification Revisions: EPA reserves the right to change the specifications should technological and/or market changes affect its usefulness to consumers, industry, or the

environment. In keeping with current policy, revisions to the specifications are arrived at through industry discussions.

*EPA Comments: In order to focus EPA/industry discussions on the most crucial elements of the Program (i.e., the definitions and energy-efficiency criteria), EPA has provided this brief draft specification document as opposed to a complete ENERGY STAR Partnership agreement.*

*The specifications, effective date, and duration of the specifications will be negotiated with industry. As always, EPA welcomes comments or alternative proposals from industry that address the issues. EPA deems industry feedback crucial to the successful development of ENERGY STAR Programs.*