



ENERGY STAR® Program Requirements for Light Commercial HVAC

Eligibility Criteria

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

A product must meet all of the identified criteria if it is to be qualified as ENERGY STAR by its manufacturer.

- 1) **Definitions:** Below is a brief description of light commercial HVAC equipment and common measures of efficiency applicable to ENERGY STAR.
 - 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 specification, 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 specification 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 specification, 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 specification in Section 3.
 - C. **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. For the purposes of this specification, units rated at 65,000 Btu/h or up to 250,000 Btu/h are eligible for the ENERGY STAR label assuming they meet the cooling portion of the specification in Section 3. In addition, three-phase equipment rated below 65,000 Btu/h may qualify according to the specification in Section 3.
 - D. **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.
 - E. **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.
 - F. **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.

- G. 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.
- H. 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.
- I. 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 ENERGY STAR, light commercial HVAC equipment includes the following: air-source air conditioners, air-source heat pumps, and gas/electric package units. 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. As it's used primarily in commercial settings, three-phase equipment rated below 65,000 Btu/h may also qualify for the label.
- 3) Energy-Efficiency Specification for Qualifying Products: Products outlined in Tables 1 and 2 below may qualify as ENERGY STAR. Please note that where applicable products must meet both the EER and IPLV specification in order to be labeled as ENERGY STAR qualified.

Table 1: Criteria for ENERGY STAR Qualified Light Commercial Air Conditioners

Equipment Type	Size Category	Specification	Test Procedure
Air-Source Air Conditioner (3 phase)	<65,000 Btu/h	≥12 SEER (as of Jan. 1, 2002) ≥13 SEER (as of Jan. 1, 2004)	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

Gas/Electric Package Unit Note: To qualify for the ENERGY STAR label, a gas/electric package unit must meet the appropriate air conditioner specification based on its size category.

Table 2: Criteria for ENERGY STAR Qualified Light Commercial Heat Pumps

Equipment Type	Size Category	Specification	Test Procedure
Air-Source Heat Pump (3 phase)	<65,000 Btu/h	≥12 SEER; 7.6 HSPF (as of Jan. 1, 2002) ≥13 SEER; 7.7 HSPF (as of Jan. 1, 2004)	ARI 210/240
Air-Source Heat Pump	≥65,000 Btu/h – <135,000 Btu/h	≥10.1 EER (10.4 IPLV); 3.2 COP	ARI 210/240 COP rated at 47° F
Air-Source Heat Pump	≥135,000 Btu/h – ≤250,000 Btu/h	≥9.3 EER (9.5 IPLV); 3.1 COP	ARI 340/360 COP rated at 47° F

- 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 specification outlined above. Light commercial air conditioners and heat pumps shall qualify under rating conditions in accordance with ARI 210/240 or ARI 340/360, as appropriate. The test procedure for each equipment type and size category is provided in Tables 1 and 2 of Section 3.

- 5) Effective Date: The date that manufacturers may begin to qualify products as ENERGY STAR is defined as the *effective date* of the agreement. The ENERGY STAR Light Commercial HVAC specification is effective on January 1, 2002. A manufacturer has one year after signing the Partnership Agreement to ensure that at least one ENERGY STAR qualified light commercial HVAC model appears on the ENERGY STAR qualified product list.

For three-phase models, a revised specification will take effect on January 1, 2004. All products shipped after this date, including models originally qualified under the 12 SEER specification, must meet the 13 SEER specification in order to bear the ENERGY STAR label (including additional shipments of models originally qualified under 12 SEER).

- 6) Future Specification Revisions: ENERGY STAR 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 January 2003, the ENERGY STAR program will begin a review of the 13 SEER specification for three-phase models, which is to take effect on January 1, 2004. During this evaluation process, ENERGY STAR will determine if the 13 SEER specification will effectively recognize the appropriate mix of energy-efficient models and their manufacturers. If necessary, the specification may be revised based on manufacturers' market data and reissued. Prior to and during this time frame, industry will have an opportunity to share its data, submit proposals, and voice any concerns.

ENERGY STAR believes that air-source heat pump equipment ($\geq 65,000$ - $\leq 250,000$ Btu/h) has the potential for further energy-efficiency improvements in the near term (e.g., next two years) and will track the market and review its specifications accordingly.