ENERGY STAR® Program Requirements
Product Specification for Light Commercial HVAC

Eligibility Criteria
DRAFT FINAL Version 2.2

Following is the **Version 2.2** product specification for ENERGY STAR qualified light commercial HVAC equipment. A product shall meet all of the identified criteria if it is to earn the ENERGY STAR.

1) Definitions: Below are the definitions of the relevant terms in this document.

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.

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.

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.

D. Variable Refrigerant Flow (VRF) Multi-Split Systems: A split system air-conditioner or heat pump incorporating a single refrigerant circuit, with one or more outdoor units, at least one variable speed compressor or an alternative compressor combination for varying the capacity of the system by three or more steps, multiple indoor fan coil units, each of which is individually metered and individually controlled by a proprietary control device and common communications network. The system shall be capable of operating either as an air conditioner or a heat pump.

E. Product Family: A product family consists of multiple models with the same outdoor unit but offering several indoor blower coil combinations. The “same outdoor unit” refers to models with the same compressor, the same heat exchanger and the same heat exchanger air quantity or water flow.

F. 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.

G. Energy Efficiency Ratio (EER): EER is a measure of efficiency in the cooling mode that represents the ratio of total cooling capacity (Btu/h) to electrical energy input (Watts).

H. 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).

I. Integrated Energy Efficiency Ratio (IEER): IEER is a measure that expresses cooling part-load EER efficiency for commercial unitary air-conditioning and heat pump equipment on the basis of weighted operation at various load capacities.

J. 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.

K. 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.

2) Scope:

A. Included Products: Three-phase, split system (i.e., a system with components located both inside and outside of a building) and single package (i.e., a system that has all components completely contained in one unit) air-source central air conditioners, air-source heat pumps, gas/electric package units, and VRF multi-split systems rated below 240,000 Btu/h that meet the definitions specified herein are eligible for ENERGY STAR qualification, with the exception of products listed in Section 2.B.

B. Excluded Products: Single phase products are not eligible for ENERGY STAR.

3) Qualification Criteria:

A. Energy Efficiency Requirements:

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

Equipment Type	Size Category	Heating Section Type	Minimum Energy Efficiency Criteria
Air-Source Central Air Conditioner (3 phase – Single Package)	<65,000 Btu/h	All	14 SEER; 11 EER
Air-Source Central Air Conditioner (3 phase – Split System)	<65,000 Btu/h	All	14 SEER; 12 EER
Air-Source Central Air Conditioner	≥65,000 Btu/h – <135,000 Btu/h	Electric Resistance (or None)	11.7 EER; 11.8 IEER
		All other	11.5 EER; 11.6 IEER
Air-Source Central Air Conditioner	≥135,000 Btu/h – <240,000 Btu/h	Electric Resistance (or None)	11.7 EER; 11.8 IEER
		All other	11.5 EER; 11.6 IEER

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

Equipment Type	Size Category	Heating Section Type	Minimum Energy Efficiency Criteria
Air-Source Heat Pump (3 phase – Single Package)	<65,000 Btu/h	All	14 SEER; 11 EER; 8.0 HSPF
Air-Source Heat Pump (3 phase – Split System)	<65,000 Btu/h	All	14 SEER; 11 EER; 8.2 HSPF
Air-Source Heat Pump	≥65,000 Btu/h – <135,000 Btu/h	Electric Resistance (or None)	11.3 EER; 11.4 IEER; 3.35 COP*
Air-Source Heat Pump	≥135,000 Btu/h – <240,000 Btu/h	Electric Resistance (or None)	10.9 EER; 11 IEER; 3.25 COP*

*Note: COP rated at 47° F.

B. VRF Multi-split Equipment: To qualify for ENERGY STAR, VRF equipment shall meet the appropriate air conditioner or heat pump specification requirements in Table 1 and 2, above.

C. Gas/Electric Package Units: To qualify for ENERGY STAR, a gas/electric package unit shall meet the appropriate air conditioner specification requirements in Tables 1 and 2, above.

D. Significant Digits and Rounding:

a. All calculations shall be carried out with actual measured or observed values. Only the final result of a calculation shall be rounded. Unless otherwise directed below, calculated results shall be rounded to the nearest significant digit as expressed in the corresponding specification limit.

b. Unless otherwise specified, compliance with specification limit shall be evaluated using exact values without any benefit from rounding.

c. SEER and HSPF shall be expressed in multiples of the nearest 0.05 Btu/W.h.

d. COP for heating or cooling shall be expressed in multiples of the nearest 0.01.

e. Capacity shall be expressed as mentioned in Table 3, below.

Table 3: Rounding Requirements for Capacity

Capacity Ratings, Btu/h	Multiples, Btu/h
65,000 up to 135,000 [19,000 up to 39,600]	1,000 [300]
136,000 up to 400,000 [39,800 up to 117,000]	2,000 [600]
above 400,000 [above 117,000]	5,000 [1,500]

4) Test Requirements:

A. Representative Models shall be selected for testing per the following requirements:

a. For qualification of an individual product model, the representative model shall be equivalent to

that which is intended to be marketed and labeled as ENERGY STAR.

b. For qualification of a product family, any model within that product family can be tested and serve as the representative model.

B. When testing light commercial HVAC equipment, the following test methods shall be used to determine ENERGY STAR qualifications:

Table 3: Test Methods for ENERGY STAR Qualification

ENERGY STAR Requirement	System Type	Test Method Reference
SEER, EER, IEER, HSPF and/or COP	Air-Source Central Air Conditioner and Air-Source Heat Pump (3 phase single package and split systems) <65,000 Btu/h	ANSI/AHRI 210/240-2008 "*Performance Rating of Unitary Air-Conditioning & Air-Source Heat Pump Equipment*"
	Air-Source Central Air Conditioner and Air-Source Heat Pump ≥65,000 Btu/h – <240,000 Btu/h	ANSI/AHRI 340/360-2007 "*Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment*"
	Variable Refrigerant Flow (VRF) Equipment	AHRI 1230-2010 "*Performance Rating of Variable Refrigerant Flow (VRF) Multi-Split Air-Conditioning and Heat Pump Equipment*"

5) **Effective Date**: This ENERGY STAR Light commercial HVAC Specification shall take effect on January 1, 2011. To qualify for ENERGY STAR, a product model shall meet the ENERGY STAR specification in effect on the date of manufacture. The date of manufacture is specific to each unit and is the date (e.g., month and year) on which a unit is considered to be completely assembled.

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 industry discussions. In the event of a specification revision, please note that the ENERGY STAR qualification is not automatically granted for the life of a product model.