



# ENERGY STAR® Program Requirements for Commercial Refrigerators and Freezers

## Partner Commitments Version 2.0

### Commitment

The following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the manufacturing of ENERGY STAR qualified commercial refrigerators and freezers. The ENERGY STAR Partner must adhere to the following program requirements:

- Comply with current ENERGY STAR Eligibility Criteria, defining the performance criteria that must be met for use of the ENERGY STAR certification mark on commercial refrigerators and freezers and specifying the testing criteria for commercial refrigerators and freezers. EPA may, at its discretion, conduct tests on products that are referred to as ENERGY STAR qualified. These products may be obtained on the open market, or voluntarily supplied by Partner at EPA's request.
- Comply with current ENERGY STAR Identity Guidelines, describing how the ENERGY STAR labels and name may be used. Partner is responsible for adhering to these guidelines and for ensuring that its authorized representatives, such as advertising agencies, dealers, and distributors, are also in compliance.
- Qualify at least one ENERGY STAR labeled commercial refrigerator or freezer model within one year of activating the commercial refrigerators and freezers portion of the agreement. When Partner qualifies the product, it must meet the specification (e.g., Tier 1 or 2) in effect at that time.
- Provide clear and consistent labeling of ENERGY STAR qualified commercial refrigerators and freezers. The ENERGY STAR label must be clearly displayed on the front/inside of the product, on the product packaging, in product literature (i.e., user manuals, spec sheets, etc.), and on the manufacturer's Internet site where information about ENERGY STAR qualified models is displayed.
- Provide to EPA, on an annual basis, an updated list of ENERGY STAR qualified commercial refrigerators and freezers. Once the Partner submits its first list of ENERGY STAR qualified commercial refrigerator and freezer models, the Partner will be listed as an ENERGY STAR Partner on [www.energystar.gov](http://www.energystar.gov). Partner must provide annual updates in order to remain on the list of participating product manufacturers.
- Provide to EPA, on an annual basis, unit shipment data or other market indicators to assist in determining the market penetration of ENERGY STAR. Specifically, Partner must submit the total number of ENERGY STAR qualified commercial refrigerators and freezers shipped (in units by model) or an equivalent measurement as agreed to in advance by EPA and Partner. Partner is also encouraged to provide ENERGY STAR qualified unit shipment data segmented by meaningful product characteristics (e.g., product type, volume, or other as relevant) for the United States (US). Partner is also encouraged to provide total unit shipments for each model in its product line, and percent of total unit shipments that qualify as ENERGY STAR. The data for each calendar year should be submitted to EPA, preferably in electronic format, no later than the following March and may be provided directly from the Partner or through a third party. The data will be used by EPA only for program evaluation purposes and will be closely controlled. Any information used will be masked by EPA so as to protect the confidentiality of the Partner.
- Notify EPA of a change in the designated responsible party or contacts for commercial refrigerators and freezers within 30 days.

## Performance for Special Distinction

In order to receive additional recognition and/or support from EPA for its efforts within the Partnership, the ENERGY STAR Partner may consider the following voluntary measures and should keep EPA informed on the progress of these efforts:

- Consider energy efficiency improvements in company facilities and pursue the ENERGY STAR label for buildings.
- Purchase ENERGY STAR qualified products. Revise the company purchasing or procurement specifications to include ENERGY STAR. Provide procurement officials' contact information to EPA for periodic updates and coordination. Circulate general ENERGY STAR qualified product information to employees for use when purchasing products for their homes.
- Ensure the power management feature is enabled on all ENERGY STAR qualified monitors and computers in use in company facilities, particularly upon installation and after service is performed. For assistance in doing so, go to [www.energystar.gov/powermanagement](http://www.energystar.gov/powermanagement).
- Provide general information about the ENERGY STAR program to employees whose jobs are relevant to the development, marketing, sales, and service of current ENERGY STAR qualified product models.
- Feature the ENERGY STAR marks on Partner Web site and in other promotional materials. If information concerning ENERGY STAR is provided on the Partner Web site as specified by the ENERGY STAR Web Linking Policy (this document can be found in the Partner Resources section on the ENERGY STAR Web site at [www.energystar.gov](http://www.energystar.gov)), EPA may provide links where appropriate to the Partner Web site.
- Provide a simple plan to EPA outlining specific measures Partner plans to undertake beyond the Program Requirements listed above. By doing so, EPA may be able to coordinate, communicate, and/or promote Partner's activities, provide an EPA representative, or include news about the event in the ENERGY STAR newsletter, on the ENERGY STAR Web pages, etc. The plan may be as simple as providing a list of planned activities or planned milestones that Partner would like EPA to be aware of. For example, activities may include: (1) increase the availability of ENERGY STAR qualified products by converting the entire product line within two years to meet ENERGY STAR guidelines; (2) demonstrate the economic and environmental benefits of energy efficiency through special in-store displays twice a year; (3) provide information to users (via the Web site and user's manual) about energy-saving features and operating characteristics of ENERGY STAR qualified products, and (4) build awareness of the ENERGY STAR Partnership and brand identity by collaborating with EPA on one print advertorial and one live press event.
- Provide quarterly, written updates to EPA as to the efforts undertaken by Partner to increase availability of ENERGY STAR qualified products, and to promote awareness of ENERGY STAR and its message.
- Join EPA's SmartWay Transport Partnership to improve the environmental performance of the company's shipping operations. SmartWay Transport works with freight carriers, shippers, and other stakeholders in the goods movement industry to reduce fuel consumption, greenhouse gases, and air pollution. For more information on SmartWay, visit [www.epa.gov/smartway](http://www.epa.gov/smartway).
- Join EPA's Climate Leaders Partnership to inventory and reduce greenhouse gas emissions. Through participation, companies create a credible record of their accomplishments and receive EPA recognition as corporate environmental leaders. For more information on Climate Leaders, visit [www.epa.gov/climateleaders](http://www.epa.gov/climateleaders).

- Join EPA's Green Power partnership. EPA's Green Power Partnership encourages organizations to buy green power as a way to reduce the environmental impacts associated with traditional fossil fuel-based electricity use. The partnership includes a diverse set of organizations including Fortune 500 companies, small and medium businesses, government institutions as well as a growing number of colleges and universities, visit <http://www.epa.gov/grnpower>.



## ENERGY STAR® Program Requirements for Commercial Refrigerators and Freezers

### Eligibility Criteria Version 2.0

Below is the **Version 2.0** product specification for ENERGY STAR qualified commercial refrigerators and freezers. A product must meet all of the identified criteria if it is to earn the ENERGY STAR.

- 1) Definitions: Provided below are definitions of the relevant terms in this document.
  - A. Commercial Food-grade Refrigerator: A refrigeration cabinet designed for storing food products at temperatures above 32 degrees Fahrenheit (F) but no greater than 40 degrees F and intended for commercial use.
  - B. Commercial Food-grade Freezer: A refrigeration cabinet designed for storing food products at temperatures of 0 degrees F and intended for commercial use.
  - C. Refrigeration Cabinet: A refrigerator or freezer used for storing food products at specified temperatures, with the condensing unit and compressor built into the cabinet, and designed for use by commercial or institutional facilities, other than laboratory settings. These units may be vertical or chest configurations and may contain a worktop surface.
  - D. Closed Refrigerator: A display or holding refrigerator where product is accessible for removal by opening or moving doors or panels<sup>1</sup>.
  - E. Solid Door Cabinet: A commercial food-grade refrigerator or freezer in which all outer doors on all sides of the unit are solid doors. These doors may be sliding or hinged.
  - F. Glass Door Cabinet: A commercial food-grade refrigerator or freezer in which all outer doors on at least one side of the unit are glass doors. These doors may be sliding or hinged.
  - G. Mixed Solid/Glass Door Cabinet: A commercial food-grade refrigerator or freezer in which all outer doors on at least one side of the unit are a combination of solid and glass doors. A unit which has all glass doors on one side and a combination of solid and glass doors on another is considered a glass door cabinet.
  - H. Solid Door: Less than 75% of the front surface area is glass.
  - I. Glass Door: Greater than, or equal to, 75% of the front surface area is glass.
  - J. Worktop Surface: A solid working surface. The working surface may be a cutting board, a stainless steel work surface, or a stone slab. This surface cannot add to the total energy consumption of the unit.
  - K. Chest Configuration: An enclosed refrigeration cabinet to which access is gained only through a top-opening door.

<sup>1</sup> Definition from ANSI/ASHRAE Standard 72-2005, Method of Testing Commercial Refrigerators and Freezers, American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. 2005.

## Test Procedure Requirements

L. AHAM Volume: The interior volume of a refrigerator as calculated by AHAM Standard Household Refrigerators/Household Freezers (ANSI/AHAM HRF-1-2004)<sup>2</sup>.

M. Integrated Average Product Temperature: The integrated average of all test package temperatures, recorded at 15-minute intervals, as determined by the test method referenced in Section 4, Test Criteria.

## Referenced Standards Organizations

N. AHAM: Association of Home Appliance Manufacturers.

O. ANSI: American National Standards Institute.

P. ASHRAE: American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc.

Q. NSF: NSF International.

R. UL: Underwriters Laboratories, Inc.

- 2) Qualifying Products: For the purposes of ENERGY STAR, only those products that meet definitions 1.A through 1.G, above, are eligible for qualification. Examples of product types that may be eligible for qualification include: reach-in, roll-in, or pass-through units; merchandisers; undercounter units; milk coolers; back bar coolers; bottle coolers; glass frosters; deep well units; beer-dispensing or direct draw units; and bunker freezers.

Drawer cabinets, prep tables, deli cases, and open air units are **not** eligible for ENERGY STAR under this Version 2.0 specification.

**Note:** This specification is intended for commercial food-grade refrigeration equipment only. Laboratory-grade refrigeration equipment cannot qualify for ENERGY STAR under this Version 2.0 specification.

Solid and glass door refrigerators and freezers qualifying under this Version 2.0 specification must be **third-party certified** to applicable requirements set forth in the following quality and safety standards:

(1) ANSI/NSF International Standard for Food Equipment – Commercial Refrigerators and Freezers (ANSI/NSF 7-2007); and

(2) UL Standard for Commercial Refrigerators and Freezers (UL-471).

**Note:** ANSI/NSF 7-2007 exempts equipment from some temperature performance requirements based on the type of food that is intended to be stored in the unit. Examples of equipment that would be exempt from the temperature performance requirements of this Standard include: refrigerators intended only for the storage or display of non-potentially hazardous bottled or canned products and refrigerators intended only for the display of unprocessed produce. Please refer to ANSI/NSF 7-2007 to determine the applicable requirements for a specific equipment type.

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<sup>2</sup> Definition from ANSI/ASHRAE Standard 72-2005, Method of Testing Commercial Refrigerators and Freezers, American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. 2005.

- 3) Energy-Efficiency Specifications for Qualifying Products: Commercial food-grade refrigerators and freezers must meet the requirements provided in Table 1 below to qualify as ENERGY STAR.

<b>Table 1: Maximum Daily Energy Consumption (MDEC) Requirements (kWh/day) for ENERGY STAR Qualified Commercial Food-grade Refrigerators and Freezers</b>		
<b>Product Volume (in cubic feet)</b>	<b>Refrigerator</b>	<b>Freezer</b>
<b>Vertical Configuration</b>		
<i>Solid Door Cabinets</i>		
$0 < V < 15$	$\leq 0.089V + 1.411$	$\leq 0.250V + 1.250$
$15 \leq V < 30$	$\leq 0.037V + 2.200$	$\leq 0.400V - 1.000$
$30 \leq V < 50$	$\leq 0.056V + 1.635$	$\leq 0.163V + 6.125$
$50 \leq V$	$\leq 0.060V + 1.416$	$\leq 0.158V + 6.333$
<i>Glass Door Cabinets</i>		
$0 < V < 15$	$\leq 0.118V + 1.382$	$\leq 0.607V + 0.893$
$15 \leq V < 30$	$\leq 0.140V + 1.050$	$\leq 0.733V - 1.000$
$30 \leq V < 50$	$\leq 0.088V + 2.625$	$\leq 0.250V + 13.500$
$50 \leq V$	$\leq 0.110V + 1.500$	$\leq 0.450V + 3.500$
<b>Chest Configuration</b>		
<i>Solid or Glass Door Cabinets</i>	$\leq 0.125V + 0.475$	$\leq 0.270V + 0.130$

Note: V = AHAM volume, as defined in Section 1, in cubic feet (ft<sup>3</sup>).

#### **Mixed Solid/Glass Door Cabinets**

This section applies to mixed solid/glass door cabinets designed with two or more compartments contained in a single cabinet with different exterior door types (i.e., one is glass and one is solid) on the same side of the cabinet. The maximum daily energy consumption (MDEC) of mixed solid/glass door cabinets shall be the sum of all individual compartment MDEC values. For purposes of mixed solid/glass door cabinets, compartments are defined by the volume associated with the different exterior door types. The interior of these compartments may or may not be physically separated.

The volume of each individual compartment shall be measured, and its MDEC limit determined, based on the compartment's volume and door type, as listed in Table 1. The sum of the volumes of each compartment must be equivalent to the total AHAM volume of the cabinet. The following information must then be reported on the Qualified Product Information (QPI) form for these types of units: the total energy consumption for the entire cabinet, the total volume of the cabinet, and the volume for each compartment.

**Example:** Consider a vertically-configured refrigeration cabinet with a total volume of 50 cubic feet with one glass half door and one solid half door on the same side. The maximum daily energy consumption (MDEC) of the equipment would be the sum of the MDEC for the two compartments. The requirement used to calculate the MDEC for each compartment is based on the compartment's volume and door type:

$$\text{Glass Door MDEC: } (25 \text{ cu. ft.} \times 0.140) + 1.050 = 4.550 \text{ kWh/day}$$

$$\text{Solid Door MDEC: } (25 \text{ cu. ft.} \times 0.037) + 2.200 = 3.125 \text{ kWh/day}$$

$$\text{MDEC for entire cabinet: } 4.550 \text{ kWh/day} + 3.125 \text{ kWh/day} = 7.675 \text{ kWh/day}$$

- 4) Test Criteria: Product models must be tested to ensure that they meet the ENERGY STAR guidelines. The test results must be reported to EPA using the Commercial Refrigerator and Freezer Version 2.0 QPI form. In addition to test results, product specification sheets (i.e. cut sheets) and test

reports from an approved source, as described below, are required to be submitted for each qualifying product model.

- A. **Testing Temperature:** Manufacturers must use ANSI/ASHRAE Standard 72-2005, "Method of Testing Commercial Refrigerators and Freezers" to measure the daily energy consumption of commercial food-grade refrigerators and freezers using the temperature specifications listed in Table 2, below.

Table 2: Temperature Specifications for Testing	
Product Type	Integrated Average Product Temperature
Commercial food-grade refrigerator	38 degrees ± 2 degrees F
Commercial food-grade freezer	0 degrees ± 2 degrees F

- B. **Additional Testing Conditions:** Only those test procedures in ANSI/ASHRAE 72-2005 relevant to *closed refrigerators* are applicable to this specification. Manufacturers should report the total energy consumption of the product, which includes both the auxiliary energy and refrigeration energy consumption. In addition, equipment must be tested according to ANSI/ASHRAE 72-2005:

- With all standard, factory-installed accessories (lighting, perimeter heat, pan heater, etc.) in the "ON" position, if manually-controlled.
- With all accessories, such as electric condensate pans, that come standard with equipment, but not necessarily factory-installed, installed and in the "ON" position.

- C. **Power Management Devices:** Equipment with energy management devices permanently installed, such that the operator is not able to adjust the settings, may be operational during the test period, if the energy management device will never change to a new integrated average product temperature after the test has been concluded. Manufacturers should refer to ANSI/ASHRAE Standard 72-2005 and its official interpretations for further guidance on power management devices.

- D. **Acceptable Testing Sources:** Test reports will only be accepted from a Commercial Refrigeration Testing Laboratory that:

- i. Is approved by the California Energy Commission Appliance Efficiency Program. A list of approved labs is available at <http://www.energy.ca.gov/appliances/forms>.

OR

- ii. Provides data that is verified by a certification body, which is accredited by the Standards Council of Canada. **Note:** this approval process is identical to the requirements for Natural Resources Canada. A list of accredited certification bodies may be found at <http://www.oee.nrcan.gc.ca/regulations/guide.cfm>, in the section titled Energy Efficiency Verification Mark.

- 5) **Effective Date:** The date that manufacturers may begin to qualify products as ENERGY STAR will be defined as the *effective date* of the agreement. Any previously executed agreement on the subject of ENERGY STAR qualified commercial refrigerators and freezers shall be terminated effective **December 31, 2009**.

- A. **Qualifying and Labeling Products under Version 2.0:** The ENERGY STAR Commercial Refrigerators and Freezers Specification Version 2.0 shall go into effect on **January 1, 2010**. All products, including models originally qualified under the previous Version 1.0 commercial refrigerator and freezer specification, with a date of manufacture on or after January 1, 2010, must meet the new Version 2.0 Program Requirements in order to qualify for ENERGY STAR

(including additional manufacturing runs of models originally qualified under the previous specification). 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.

- B. **Glass Door Cabinets:** Glass door cabinets, as defined in Section 1 above, meeting the requirements of this Version 2.0 specification may begin qualifying for ENERGY STAR on **April 1, 2009.**
- 6) **Future Specification Revisions:** ENERGY STAR reserves the right to revise the specifications should technological and/or market changes affect its usefulness to purchasers, industry, or the environment. In keeping with current policy, revisions to the specification are arrived at through discussions with stakeholders. 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. To qualify as ENERGY STAR, a product model must meet the ENERGY STAR specification in the effect on the date of manufacture.
- A. **Drawer Cabinets:** EPA will monitor industry efforts to develop a test procedure to measure and compare the energy performance of refrigerated drawer cabinets. Based on the availability of an industry accepted test procedure and performance data, EPA may consider adding this product category in future versions of this specification.
  - B. **Laboratory Grade Refrigerators and Freezers:** EPA is currently working with manufacturers of laboratory grade refrigerators and freezers to develop separate requirements for equipment designed for and used in laboratory environments. Once these requirements are finalized, EPA may amend this Version 2.0 specification to include laboratory grade refrigerators and freezers.