



ENERGY STAR® Program Requirements For Commercial Refrigerators and Freezers

Partner Commitments

Following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the manufacture and labeling of ENERGY STAR qualified products. The ENERGY STAR Partner must adhere to the following partner commitments:

Qualifying Products

1. Comply with current ENERGY STAR Eligibility Criteria, which define performance requirements and test procedures for commercial refrigerators and freezers. A list of eligible products and their corresponding Eligibility Criteria can be found at www.energystar.gov/specifications.
2. **Prior to associating the ENERGY STAR name or mark with any product**, obtain written certification of ENERGY STAR qualification from a Certification Body recognized by EPA for commercial refrigerators and freezers. As part of this certification process, products must be tested in a laboratory recognized by EPA to perform commercial refrigerator and freezer testing. A list of EPA-recognized laboratories and Certification Bodies can be found at www.energystar.gov/testingandverification.

Using the ENERGY STAR Name and Marks

3. Comply with current ENERGY STAR Identity Guidelines, which define how the ENERGY STAR name and marks may be used. Partner is responsible for adhering to these guidelines and ensuring that its authorized representatives, such as advertising agencies, dealers, and distributors, are also in compliance. The ENERGY STAR Identity Guidelines are available at www.energystar.gov/logouse.
4. Use the ENERGY STAR name and marks only in association with qualified products. Partner may not refer to itself as an ENERGY STAR Partner unless at least one product is qualified and offered for sale in the U.S. and/or ENERGY STAR partner countries.
5. Provide clear and consistent labeling of ENERGY STAR certified commercial refrigerators and freezers.
 - 5.1. The ENERGY STAR mark must be clearly displayed on the top/front of the product (on product labels and/or as a permanent mark), in product literature (i.e., user manuals, spec sheets, etc.) and on the manufacturer's Internet site where information about ENERGY STAR certified models is displayed.
 - 5.2. It is also recommended that the mark appear on the product packaging.

Verifying Ongoing Product Qualification

6. Participate in third-party verification testing through a Certification Body recognized by EPA for commercial refrigerators and freezers, providing full cooperation and timely responses. EPA/DOE may also, at its discretion, conduct tests on products that are referred to as ENERGY STAR certified. These products may be obtained on the open market, or voluntarily supplied by Partner at the government's request.

Providing Information to EPA

7. Provide unit shipment data or other market indicators to EPA annually to assist with creation of ENERGY STAR market penetration estimates, as follows:
 - 7.1. Partner must submit the total number of ENERGY STAR certified commercial refrigerators and freezers shipped in the calendar year or an equivalent measurement as agreed to in advance by EPA and Partner. Partner shall exclude shipments to organizations that rebrand and resell the shipments (unaffiliated private labelers).
 - 7.2. Partner must provide unit shipment data segmented by meaningful product characteristics (e.g., type, capacity, presence of additional functions) as prescribed by EPA.
 - 7.3. Partner must submit unit shipment data for each calendar year to EPA or an EPA-authorized third party, preferably in electronic format, no later than March 1 of the following year.

Submitted unit shipment data will be used by EPA only for program evaluation purposes and will be closely controlled. If requested under the Freedom of Information Act (FOIA), EPA will argue that the data is exempt. Any information used will be masked by EPA so as to protect the confidentiality of the Partner.
8. Report to EPA any attempts by recognized laboratories or Certification Bodies to influence testing or certification results or to engage in discriminatory practices.
9. Notify EPA of a change in the designated responsible party or contacts within 30 days using the My ENERGY STAR Account tool (MESA) available at www.energystar.gov/mesa.

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:

- 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.
- Consider energy efficiency improvements in company facilities and pursue benchmarking buildings through the ENERGY STAR Buildings program.
- 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.
- Feature the ENERGY STAR mark(s) on Partner website and other promotional materials. If information concerning ENERGY STAR is provided on the Partner website as specified by the ENERGY STAR Web Linking Policy (available in the Partner Resources section of the ENERGY STAR website), EPA may provide links where appropriate to the Partner website.
- Ensure the power management feature is enabled on all ENERGY STAR qualified displays and computers in use in company facilities, particularly upon installation and after service is performed.
- 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 products.
- 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, and communicate

Partner's activities, provide an EPA representative, or include news about the event in the ENERGY STAR newsletter, on the ENERGY STAR website, etc. The plan may be as simple as providing a list of planned activities or milestones of which Partner would like EPA to be aware. For example, activities may include: (1) increasing the availability of ENERGY STAR qualified products by converting the entire product line within two years to meet ENERGY STAR guidelines; (2) demonstrating the economic and environmental benefits of energy efficiency through special in-store displays twice a year; (3) providing information to users (via the website and user's manual) about energy-saving features and operating characteristics of ENERGY STAR qualified products; and (4) building awareness of the ENERGY STAR Partnership and brand identity by collaborating with EPA on one print advertorial and one live press event.

- Join EPA's SmartWay Transport Partnership to improve the environmental performance of the company's shipping operations. The SmartWay Transport Partnership 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.
- 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. For more information on Green Power, visit www.epa.gov/greenpower.



ENERGY STAR Program Requirements Product Specification for Commercial Refrigerators and Freezers

Eligibility Criteria Version 4.0

Following is the **Version 4.0** product specification for ENERGY STAR qualified commercial refrigerators and freezers. 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. Where applicable, the cited definitions are aligned with the definitions in DOE's regulations found in 10 Part CFR 431. When in conflict, the definitions in the Code of Federal Regulations (CFR) take precedence.
- A. Commercial Refrigerator: A unit of commercial refrigeration equipment in which all refrigerated compartments in the unit are capable of operating at or above 32°F (±2°F).¹
 - B. Commercial Freezer: A unit of commercial refrigeration equipment in which all refrigerated compartments in the unit are capable of operating below 32°F (±2°F).¹
 - C. Commercial Refrigerator-Freezer: A unit of refrigeration equipment consisting of two or more refrigerated compartments where at least one refrigerated compartment is capable of operating at or above 32°F (±2°F) and at least one refrigerated compartment is capable of operating below 32°F (±2°F).¹
 - D. Commercial Refrigerator, Freezer, and Refrigerator-Freezer: Refrigeration equipment that: (a) is not a consumer product (as defined in §431.2 of part 430); (b) is not designed and marketed exclusively for medical, scientific, or research purposes; (c) operates at a chilled, frozen, combination chilled and frozen, or variable temperature; (d) displays or stores merchandise and other perishable materials horizontally, semi-vertically, or vertically; (e) has transparent or solid doors, sliding or hinged doors, a combination of hinged, sliding, transparent, or solid doors, or no doors; (f) is designed for pull-down temperature applications or holding temperature applications; and (g) is connected to a self-contained condensing unit or to a remote condensing unit.¹
 - E. Commercial Hybrid: A unit of commercial refrigeration equipment that: (a) consists of two or more thermally separated refrigerated compartments that are in two or more different equipment families; and (b) is sold as a single unit.¹
 - F. Horizontal Closed: Equipment with hinged or sliding doors and a door angle greater than or equal to 45°. ¹
 - G. Horizontal Open: Equipment without doors and an air-curtain angle greater than or equal to 80° from the vertical. ¹
 - H. Vertical Closed: Equipment with hinged or sliding doors and a door angle less than 45°. ¹

¹ 10 CFR Subpart C §431.62

- I. Vertical Open: Equipment without doors and an air-curtain angle greater than or equal to 0° and less than 10° from the vertical.¹
- J. Closed Solid: Equipment with doors, and in which more than 75 percent of the outer surface area of all doors on a unit are not transparent.¹
- K. Closed Transparent: Equipment with doors, and in which 25 percent or more of the outer surface area of all doors on the unit are transparent.¹
- L. Self-Contained Condensing Unit: A factory-made assembly of refrigerating components designed to compress and liquefy a specific refrigerant that is an integral part of the refrigerated equipment and consists of 1 or more refrigerant compressors, refrigerant condensers, condenser fans and motors, and factory supplied accessories.¹
- M. Ice Cream Freezer: A commercial freezer that is designed to operate at or below -5°F (±2°F) (-21°C ±1.1°C) and that the manufacturer designs, markets, or intends for the storing, displaying, or dispensing of ice cream.¹
- N. Convertible Temperature Equipment: Refrigeration equipment that: (a) is not a consumer product (as defined in §431.2 of part 430); (b) is not designed and marketed exclusively for medical, scientific, or research purposes; (c) has one or more compartments that operates at a chilled, frozen, or variable temperature condition between approximately 38°F and 0°F; (d) displays or stores merchandise and other perishable materials horizontally, semi-vertically, or vertically; (e) has hinged transparent and/or solid doors; (f) has a user adjustable application temperature set point within the operating range of 38°F and 0°F; and (g) is connected to a self-contained condensing unit or to a remote condensing unit.
- O. Chef Base or Griddle Stand: Commercial refrigeration equipment that is designed and marketed for the express purpose of having a griddle or other cooking appliance placed on top of it that is capable of reaching temperatures hot enough to cook food.¹
- P. Prep Table: A commercial refrigerator, freezer, or refrigerator-freezer in which a food condiment rail designed to hold open perishable food is located above the chilled or frozen storage compartment or compartments. The condiment rail is designed to hold perishable food product between 33°F and 41°F.
- Q. Semivertical Open: Equipment without doors and an air curtain angle greater than or equal to 10° and less than 80° from the vertical.¹
- R. Service Over Counter: Equipment that has sliding or hinged doors in the back intended for use by sales personnel, with glass or other transparent material in front for displaying merchandise, and that has a height not greater than 66 inches and is intended to serve as a counter for transactions between sales personnel and customers.¹
- S. Basic Model: All commercial refrigeration equipment manufactured by one manufacturer within a single equipment class, having the same primary energy source, and that have essentially identical electrical, physical, and functional characteristics that affect energy consumption.¹
- T. Equipment Family: Classification determined by equipment geometry and door orientation, including: Vertical Open (VOP), Semi-Vertical Open (SVO), Horizontal Open (HZO), Vertical Closed Transparent (VCT), Vertical Closed Solid (VCS), Horizontal Closed Transparent (HCT), and Horizontal Closed Solid (HCS).

2) Scope:

- A. **Included Products:** Products that (1) meet the definitions of a Commercial Refrigerator, Freezer, and Refrigerator-Freezer, or Commercial Hybrid; and (2) fall under the eligible equipment class designations in Section 2.A.a-h, or a combination of equipment classes herein, are eligible for ENERGY STAR certification:
- a) Horizontal Closed Solid Self-Contained Low Temperature (HCS.SC.L),
 - b) Horizontal Closed Solid Self-Contained Medium Temperature (HCS.SC.M),
 - c) Horizontal Closed Transparent Self-Contained Low Temperature (HCT.SC.L),
 - d) Horizontal Closed Transparent Self-Contained Medium Temperature (HCT.SC.M),
 - e) Vertical Closed Solid Self-Contained Low Temperature (VCS.SC.L),
 - f) Vertical Closed Solid Self-Contained Medium Temperature (VCS.SC.M),
 - g) Vertical Closed Transparent Self-Contained Low Temperature (VCT.SC.L), and/or
 - h) Vertical Closed Transparent Self-Contained Medium Temperature (VCT.SC.M).

Examples of product types that are eligible for qualification include: reach-in, roll-in, or pass-through units; merchandisers; under-counter units; hybrid units; milk coolers; back bar coolers; bottle coolers; glass frosters; deep well units; beer-dispensing or direct draw units; and bunker freezers.

To be eligible for this specification, commercial refrigeration equipment shall be commercial-grade and third-party certified to the applicable requirements set forth in the following quality and safety standards:

- a. ANSI/NSF International Standard for Food Equipment – Commercial Refrigerators and Freezers (ANSI/NSF 7-2014); and
- b. UL Standard for Commercial Refrigerators and Freezers (UL-471).

Note: ANSI/NSF 7-2014 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 7-2014 to determine the applicable requirements for a specific equipment type.

- B. **Excluded Products:** Chef base or griddle stands, prep tables, service over counter equipment, horizontal open equipment, vertical open equipment, semi-vertical open equipment, remote condensing equipment, convertible temperature equipment, and ice cream freezers are not eligible for ENERGY STAR. Products that are covered under other ENERGY STAR product specifications (e.g. Residential Refrigerators and Freezers) are not eligible for certification under this specification.

3) Qualification Criteria:

A. Maximum Daily Energy Consumption (MDEC) Requirements:

Table 1: ENERGY STAR Requirements for Commercial Refrigerators, Freezers, and Refrigerator-Freezer ²		
Product Volume (in cubic feet)	Refrigerator	Freezer
Vertical Closed		
<i>Solid</i>	VCS.SC.M*	VCS.SC.L
0 < V < 15	0.022V+0.97	0.21V+0.9
15 ≤ V < 30	0.066V+0.31	0.12V+2.248
30 ≤ V < 50	0.04V+1.09	0.285V-2.703
50 ≤ V	0.024V+1.89	0.142V+4.445
<i>Transparent</i>	VCT.SC.M	VCT.SC.L
0 < V < 15	0.095V+0.445	0.232V+2.36
15 ≤ V < 30	0.05V+1.12	
30 ≤ V < 50	0.076V+0.34	
50 ≤ V	0.105V-1.111	
Horizontal Closed		
<i>Solid or Transparent</i>	HCT.SC.M, HCS.SC.M	HCT.SC.L, HCS.SC.L
All volumes	0.05V+0.28	0.057V+0.55

* DOE Equipment Class designations relevant to ENERGY STAR eligible product scope

- (1) Equipment family code (HCS= horizontal closed solid, HCT=horizontal closed transparent, VCS= vertical closed solid, VCT=vertical closed transparent),
- (2) Operating mode (SC=self-contained), and
- (3) Rating Temperature (M=medium temperature (38 °F), L=low temperature (0 °F)).

B. Determination of Refrigerated Volume: The refrigerated volume (V) of a refrigerator or freezer shall be calculated in accordance with the DOE test procedure at 10 CFR §431.64.

C. Determining Maximum Daily Energy Consumption for Commercial Hybrid: This section applies to Commercial Hybrid Refrigerators, Freezers, and Refrigerator-Freezers. The maximum daily energy consumption (MDEC) of hybrid equipment shall be the sum of all individual compartment MDEC values. For purposes of hybrid equipment, the refrigerated volume associated with the different equipment families defines compartments.

The refrigerated 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 above. The sum of the volumes of each compartment shall be equivalent to the total volume of the cabinet.

Example: Consider a vertical closed refrigeration cabinet with a total volume of 50 cubic feet with one compartment having a transparent door and the other compartment having a solid door. The 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:

$$\text{Transparent Door MDEC: } (25 \text{ cu. ft.} \times 0.05) + 1.12 = 2.37 \text{ kWh/day}$$

$$\text{Solid Door MDEC: } (25 \text{ cu. ft.} \times 0.066) + 0.31 = 1.96 \text{ kWh/day}$$

² The operating temperature range for commercial refrigerators and freezers is located at 10 CFR Part 431.66 (e)

MDEC for entire cabinet: 2.37 kWh/day + 1.96 kWh/day = 4.33 kWh/day

D. Significant Digits and Rounding:

- a. All calculations shall be carried out with directly measured (unrounded) values. Final ratings for daily energy consumption shall be rounded to 0.01 kWh increments in accordance with the DOE test procedure provisions.
- b. Directly measured or calculated values that are submitted for reporting on the ENERGY STAR website shall be calculated in accordance with the requirements for determining certified ratings for DOE.

4) Test Requirements:

- A. One of the following sampling plans shall be used for purposes of testing for ENERGY STAR certification:
 - a. A single unit is selected, obtained, and tested. The measured performance of this unit and of each subsequent unit manufactured must be equal to or better than the ENERGY STAR specification requirements. Results of the tested unit may be used to certify additional individual model variations within a basic model group as long as the definition for basic model group provided in Section 1, above, is met; or
 - b. Units are selected for testing and results calculated according to the sampling requirements defined in 10 CFR Part 429, Subpart B § 429.42. The certified rating must be equal to or better than the ENERGY STAR specification requirements. Results of the tested unit may be used to certify additional model variations within a basic model group as long as the definition for basic model group provided in Section 1, above, is met. Further, all individual models within a basic model group must have the same certified rating based on the applicable sampling criteria this rating must be used for all manufacturer literature, the qualified product list, and certification of compliance to DOE standards.
- B. When testing commercial refrigerators and freezers, the following test methods shall be used to determine ENERGY STAR qualification:

Table 2: Test Methods for ENERGY STAR Qualification	
ENERGY STAR Requirement	Test Method Reference
Daily Energy Consumption (DEC)	10 CFR Part 431 Subpart C, 10 CFR Part 431.64, and 10 CFR Part 431.66(e)(2),

- 5) **Effective Date:** The ENERGY STAR Commercial Refrigerator and Freezer Version 4.0 specification shall take effect on March 27, 2017. To qualify for ENERGY STAR, a product model shall meet the ENERGY STAR specification in effect on the model's date of manufacture. The date of manufacture is specific to each unit and is the date 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 achieved through market research and industry discussions. In the event of a specification revision, please note that ENERGY STAR certification is not automatically granted for the life of a product model.