



ENERGY STAR® Program Requirements Product Specification for Refrigerated Beverage Vending Machines

Eligibility Criteria Version 3.0: DRAFT 2

Following is the **Draft 2** Version 3.0 product specification for ENERGY STAR qualified refrigerated beverage vending machines. A product must 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. **Refrigerated Beverage Vending Machine:** A commercial refrigerator that cools bottled or canned beverages and dispenses the bottled or canned beverages on payment. *Bottled or canned beverages* are defined as “within a sealed container.”
 - a. **Class A Machine:** A refrigerated bottled or canned beverage vending machine that is fully cooled, and is not a combination vending machine.
 - b. **Class B Machine:** Any refrigerated bottled or canned beverage vending machine not considered to be Class A, and is not a combination vending machine.
 - c. **Combination Machine:** A refrigerated bottled or canned beverage vending machine that also has non-refrigerated volumes for the purpose of vending other, non-“sealed beverage” merchandise.
 - B. **Rebuilt Refrigerated Beverage Vending Machine:** A UL Listed or Classified refrigerated beverage vending machine that has been previously in use and subjected to various degrees of retrofitting, remanufacturing, refurbishing, repairing, or reconditioning for resale or reuse. For purposes of ENERGY STAR qualification, rebuilt model shall include the machine and energy efficiency components or kit installed to meet ENERGY STAR requirements.
 - C. **Rebuilding Kit:** A combination of components that may be installed in a previously used vending machine at a refurbishment center.
 - D. **Basic Model¹:** All units of a given type of covered product (or class thereof) manufactured by one manufacturer, having the same primary energy source, and which have essentially identical electrical, physical, and functional characteristics that affect energy consumption or energy efficiency.
 - E. **Low Power Mode:** The reduced power state of a refrigerated beverage vending machine during extended periods of inactivity.
 - F. **OEM:** Original Equipment Manufacturer.
 - G. **Qualified component supplier (QCS):** A company that produces components and/or rebuilding kits for vending machines.
 - H. **Refurbishment Center (RC):** A facility equipped to rebuild vending machines.

¹ 10 CFR 431.292 of Subpart Q.

2) **Scope:**

- A. **Included Products:** Products that meet the definition of a Refrigerated Beverage Vending Machine as specified herein are eligible for ENERGY STAR qualification, with the exception of products listed in Section 2.B.
- B. **Excluded Products:** Combination Vending Machines, as defined in Section 1 above, are not eligible for ENERGY STAR.

Note: EPA continues to have concerns regarding the inclusion of combination machines under this Version 3.0 specification. The primary goal for revising this specification is to harmonize with the U.S. Department of Energy (DOE) standard with regard to scope, test procedure, and metric (MDEC). Furthermore, the ASHRAE 32.1 test method is only intended to evaluate energy efficiency performance of "Vending Machines for Bottled, Canned, and Other Sealed Beverages" and applies to combination machines in a beverage *only* configuration. It was never the intent of the program to cover these combination machines and there have been several instances where combination machines using snack only configurations carry the ENERGY STAR label, causing confusion and potentially unfair advantage in the marketplace. Based on industry interest, EPA may consider developing separate requirements, and test methods as needed, for combination and other non-beverage vending machines following the finalization of this Version 3.0.

3) **Qualification Criteria:**

- A. **Maximum Daily Energy Consumption (MDEC):** To qualify for ENERGY STAR, refrigerated beverage vending machines shall consume equal to or less than the MDEC values obtained using the equations below:
 - a. Class A – New and Remanufactured Machines: $0.0523V + 2.432$
 - b. Class B – New and Remanufactured Machines: $0.0657V + 2.844$

Where, V = the refrigerated volume (ft³) of the refrigerated bottled or canned beverage vending machine, as measured by the American National Standards Institute (ANSI)/Association of Home Appliance Manufacturers (AHAM) HRF-1-2004, "Energy, Performance and Capacity of Household Refrigerators, Refrigerator-Freezers and Freezers."

Note: In general, stakeholders recognize the value of ENERGY STAR and continue to support an ENERGY STAR vending machine program. However, manufacturers and other industry stakeholders believe that the previous Draft 1 MDEC level, which was 20% better than DOE, was too stringent in the short term especially given the significant changes that need to be made to existing machines just to meet the upcoming DOE standard. In parallel, efforts are underway to design new machines that accept natural refrigerants (e.g., CO₂) in support of industry wide efforts to reduce environmental impacts of GHG emissions linked to the use of HFC refrigerants. Preliminary data suggests that machines using alternate and more environmentally acceptable refrigerants could be less efficient than their HFC counterparts due in large part to the fact that vending is a new market for natural refrigerants and there are limited component solutions available at this time. Based on discussions with industry stakeholders, in time the expectation is that natural refrigerant machines will be able to reach the same efficiencies as HFC designs.

EPA is supportive of industry efforts to use more natural refrigerants in vending machine designs but also must balance this with the need for ENERGY STAR to continue providing differentiation and savings in the marketplace. In response, EPA is proposing a slightly less stringent MDEC level for Type B Machines - 10% better than the DOE standard. This new level allows EPA to highlight for buyers more efficient models while ensuring adequate cost effective selections.

Machine Type A: EPA recognizes possible challenges faced by manufacturers in meeting the DOE Machine Type A level but believes that meaningful energy savings could be realized in this market through ENERGY STAR recognition, particularly for remanufactured machines which are not covered by the DOE scope. Industry stakeholders have voiced support for keeping these machines in the ENERGY STAR program but shared concern about an achievable level above DOE.

EPA is proposing a MDEC level that is 5% better than the DOE standard level. Because potential purchasers could be considering both new and remanufactured machines for the same application, it is important that the label provide the same expectations and as such, both types of machines be held to the same requirements. While the selection of ENERGY STAR qualified Type A machines would be extremely limited initially, we understand this level to be achievable. With the alternative being to sunset the ENERGY STAR label for Type A machines, EPA is proposing to continue under this approach with the hope that by providing a viable incentive towards greater efficiency the Agency will also prevent losses in efficiencies, particularly for remanufactured machines not covered by the DOE standard.

Stakeholders are encouraged to provide feedback on the proposed levels for Machine Type A and B.

- B. Low Power Mode: In addition to meeting the 24-hour energy consumption requirements in Section 3A, qualifying models shall come equipped with hard wired controls and/or software capable of placing the machine into a low power mode during periods of extended inactivity while still connected to its power source to facilitate the saving of additional energy, where appropriate.
- a. The machine shall be capable of operating in at least one of the low power mode states described below:
 1. Lighting low power state – lights off for an extended period of time.
 2. Refrigeration low power state – the average beverage temperature is allowed to rise to 40°F or higher for an extended period of time.
 3. Whole machine low power state – the lights are off and the refrigeration operates in its low power state.
 - b. Machine shall be capable of returning itself back to its normal operating conditions at the conclusion of the inactivity period.
 - c. The low power mode-related controls/software shall be capable of on-site adjustment by the vending operator or machine owner unless the low power controlling device is already pre-programmed when installed into the machine.

While only one of the above low power mode states is required, EPA encourages new machine manufacturers to continue to include all of the low power mode options in equipment designs and partners that are rebuilding machines to seek out new technologies that might help to achieve this goal as well.

EPA encourages partners to train vending machine installers to provide information to host sites on the low power mode capabilities of their machines so that these capabilities may be enabled as desired by the host site.

EPA's goal in including these low power mode requirements is to ensure that existing machine software capabilities are available and may be used to their fullest potential based on the individual requirements of the host site. However, machines that are vending temperature sensitive product, such as milk, shall not have the refrigeration low power state enabled on site by the vending operator or machine owner due to the risk of product spoilage.

- C. Significant Digits and Rounding:
- a. All calculations shall be carried out with actual measured (unrounded) values. Only the final result of a calculation shall be rounded.

- b. Unless otherwise specified, compliance with specification limit shall be evaluated using exact values without any benefit from rounding.
- c. Directly measured or calculated values that are submitted for reporting on the ENERGY STAR website shall be rounded to three significant digits.

4) **Test Requirements:**

- A. One of the following sampling plans shall be used to test energy performance for qualification to ENERGY STAR:
 - a. A representative unit shall be selected for testing based on the definition for Basic Model provided in Section 1, above; or
 - b. Units shall be selected for testing per the sampling requirements defined in 10 CFR §429.52.
- B. When testing refrigerated beverage vending machines, the following test methods shall be used to determine ENERGY STAR qualification:

Table 1: Test Standards for ENERGY STAR Qualification	
ENERGY STAR Requirement	Test Method Reference
MDEC	10 CFR Part 431 Subpart Q, 10 CFR Part 431.294

- 5) **Effective Date:** This ENERGY STAR Product Specification for Refrigerated Beverage Vending Machines shall take effect on **August 31, 2012**. 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.

Note: Several stakeholders requested effective dates beyond the proposed August 31, 2012. As explained during the ENERGY STAR stakeholder webinar, it is important that ENERGY STAR continue to serve as a differentiator in the marketplace once the federal standard is implemented offering end users energy savings above standard product offerings. Therefore, EPA is continuing to propose this effective date for the new Version 3.0 specification.

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