



ENERGY STAR[®] Product Specification for Commercial Hot Food Holding Cabinets

Version 2.0 Eligibility Criteria Final Draft

1 Following is the **Final Draft** Version 2.0 product specification for ENERGY STAR qualified commercial hot
2 food holding cabinets. A product shall meet all of the identified criteria if it is to earn the ENERGY STAR.

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4 **Note:** In addition to revisions proposed in previous draft versions, EPA is introducing additional
5 refinements in this Final Draft to further clarify qualification requirements and ensure a level playing field
6 to support upcoming changes to the ENERGY STAR program, which will include the requirement of third-
7 party certification for product qualification. Similar revisions are being made to all ENERGY STAR
8 product specifications, including the existing Hot Food Holding Cabinet Version 1.0 specification. EPA
9 plans to share these revisions with stakeholders for review and comment in September.

10 In addition, EPA is working to modify the Partner Commitments to address these enhanced testing and
11 verification requirements that will apply to all ENERGY STAR product categories starting in early 2011.
12 An updated Partner Commitments document specific to Hot Food Holding Cabinets will also be released
13 in early September. For more information on enhanced testing and verification requirements, visit:
14 www.energystar.gov/testingandverification.

15 This Final Draft document represents the final opportunity for stakeholders to provide comments prior to
16 EPA finalizing the new specification. Comments should be submitted **no later than September 16, 2010**
17 to commercialfoodservice@energystar.gov.

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

20 A. Commercial Hot Food Holding Cabinet: A heated, fully enclosed compartment with one or more
21 solid or transparent doors designed to maintain the temperature of hot food that has been cooked
22 using a separate appliance.

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24 B. Idle Energy Rate–Dry: The rate of appliance energy consumption while it is maintaining or holding
25 at the control set point, without using a humidity-generating device (if applicable). For purposes of
26 this specification, idle energy rate is measured in watts.

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28 C. Drawer Warmer: An appliance that consists of one or more heated drawers and that is designed
29 to hold hot food that has been cooked in a separate appliance at a specified temperature.

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31 D. Heated Transparent Merchandising Cabinets: An appliance with a heated compartment that is
32 designed to display and maintain the temperature of hot food that has been cooked in a separate
33 appliance.

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35 E. Cook-and-Hold Appliance: A multiple-mode appliance intended for cooking food that may be used
36 to hold the temperature of the food that has been cooked in the same appliance.

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38 F. Proofing Cabinet: An enclosed mobile, portable, or stationary appliance designed to maintain the
39 proper temperature and relative humidity for supporting fermentation of dough products by yeast.

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41 G. Product Family: Models built based on the same basic engineering design with the exact same
42 interior cabinet volume. Units within the family may differ in regards to energy consumption as

43 long as cabinet size remains constant. Qualification of the product family shall be based on a
44 representative model, as defined in Section 5 of this specification.

45 **Note:** A new definition for product family is included, above, to delineate allowable model differences for
46 purposes of family qualification. Qualification requirements, including a definition for representative
47 model, are presented in Section 5, below. Stakeholders are encouraged to provide feedback on this
48 product family definition.

49 **2) Scope**

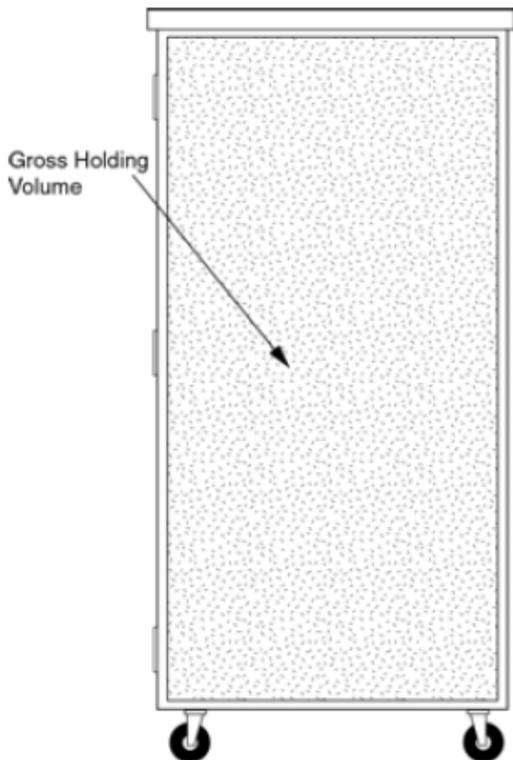
50 A. Included Products: Products that meet the definition of a Commercial Hot Food Holding Cabinet
51 as specified herein are eligible for ENERGY STAR qualification, with the exception of products
52 listed in Section 2.B.
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54 This specification is intended for commercial food-grade equipment only. Hot food holding
55 cabinets qualifying under this specification must be third party certified to: (1) ANSI/NSF Standard
56 4 International Standard for Commercial Cooking, Rethermalization and Powered Hot Food
57 Holding Transport Equipment and (2) ANSI/UL Standard 197 Commercial Electric Cooking
58 Appliances.
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60 B. Excluded Products: Dual function equipment (e.g., cook-and-hold and proofing units), heated
61 transparent merchandising cabinets, and drawer warmers are not eligible for ENERGY STAR.
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64 **3) Qualification Criteria:** To qualify for ENERGY STAR, commercial hot food holding cabinets shall
65 meet all of the requirements provided below.
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67 A. Measuring Cabinet Interior Volume: Commercial hot food holding cabinet interior volume shall be
68 calculated using straight-line segments following the gross interior dimensions of the appliance
69 and using **Equation 1** below. Interior volume shall not account for racks, air plenums or other
70 interior parts.
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Equation 1: *Interior Volume = Interior Height x Interior Width x Interior Depth*

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B. Maximum Idle Energy Rate Requirements:

Table 1: Maximum Idle Energy Rate Requirements for ENERGY STAR Qualification	
Product Interior Volume (Cubic Feet)	Product Idle Energy Consumption Rate (Watts)
$0 < V < 13$	$\leq 21.5 V$
$13 \leq V < 28$	$\leq 2.0 V + 254.0$
$28 \leq V$	$\leq 3.8 V + 203.5$

Note: V = Interior volume in cubic feet (ft³).

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C. Significant Digits and Rounding: Idle Energy Rate shall be reported using the rounding principles provided below.

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a. All calculations shall be carried out with actual measured or observed values. Only the final result of a calculation shall be rounded. Calculated results shall be rounded to the tenth decimal point.

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

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Note: There continues to be industry interest in allowing large banquet holding cabinets (≥ 55 cubic feet) to be eligible for ENERGY STAR under this specification. In response to this feedback, and to avoid potential confusion in the marketplace regarding eligibility within a product family that may include these larger units, EPA decided to provide manufacturers the opportunity to continue qualifying these product types under the new specification. EPA adjusted the specification line for the 28+ bin to allow for a somewhat greater selection of ENERGY STAR qualified models in the larger banquet sizes. This resulted in a more natural progression in energy consumption based on cabinet size. This shift is consistent with the expectation that relatively minor advances in efficiency occurring between now and the specification effective date will result in even greater selection. Please note that although there is a change to the calculation presented in Table 1 for the 13 – 28 bin, EPA was able to retain the qualification rate presented to stakeholders in the previous analysis.

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Stakeholders will be able to review the data analysis by visiting: www.energystar.gov/revisedspecs. EPA will follow industry developments in regards to larger cabinet design and may revisit the level for the 28+ bin if it appears that greater efficiencies are attainable on a larger scale.

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A new section 3C is included above to provide further guidance regarding the rounding of test results for purposes of ENERGY STAR qualification.

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4) **Test Requirements:** When testing commercial hot food holding cabinets, the following test methods shall be used to determine ENERGY STAR qualification:

Table 2: Test Methods for ENERGY STAR Qualification	
Energy Efficiency Requirement	Test Method Reference
Idle Energy Rate	ASTM Standard F2140-10, <i>Test Method for the Performance of Hot Food Holding Cabinets</i>

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130 **Note:** In the Draft 3 specification, EPA proposed replacing the currently referenced ASTM Standard
131 F2140-01 with the more recent F2140-10 version under development. One of the proposed revisions
132 involves a repositioning of the thermocouples to match NSF testing requirements. This change is not
133 expected to alter energy efficiency performance results. The second proposed revision to the test
134 method requires the test length to be 3 hours, or 10 thermostat cycles, whichever is longer. This change
135 will provide greater confidence in the test results and accuracy of the reported performance, which
136 supports EPA's goal to improve data integrity and reliability.
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138 As of the release of this Final Draft, the ASTM Standard F2140-10 is still in draft form and under ASTM
139 committee review. While significant changes are not envisioned by its authors prior to finalization, EPA
140 will review the final version, when available, to ensure that no material changes have been made to the
141 applicable sections of the document. EPA anticipates that the new standard will be finalized later this
142 year and will take effect by the time the Version 2.0 specification becomes effective (i.e., May 2011).
143 Therefore, EPA has decided to reference this more recent version for purposes of qualification under
144 Version 2.0. EPA will not require retesting of existing ENERGY STAR qualified hot food holding cabinets
145 to remain qualified.

146 5) Qualification and Reporting:

147 A. Product Families: Product families that are submitted for ENERGY STAR qualification shall
148 include the following:

149 a. Documentation of test results for the representative model. For purposes of ENERGY STAR
150 qualification, the most consumptive unit within the product family, as defined in Section 1 of
151 this specification, shall serve as the representative model.

152 For example, if a manufacturer offers a 40 cubic foot unit that is sold with several door
153 options, some of which would result in a slightly different Idle energy rate, manufacturer shall
154 test the most consumptive (i.e., worst case) option that would then represent all of the 40
155 cubic foot units within that model family.
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157 b. A list of all model numbers to be included in the product family.
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159 c. Documentation sufficient to provide evidence that all models in the product family share a
160 common basic design (e.g., specification sheets).
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162 **Note:** The new Section 5 above is intended to provide clarification on the required testing,
163 qualification, and reporting to manufacturers interested in qualifying models based on the product
164 family approach. The example provided in the notebbox under this proposed requirement in the Draft
165 3 version is now included above to provide clarity regarding this allowance.

166 In the previous Draft 3 specification, EPA proposed an approach to qualification that would allow the
167 most consumptive unit within a product family to be tested, and serve as the representative model for
168 other units within that product family as long as they share the same basic engineering design and
169 identical interior cabinet volume. This reduces the testing burden since any one cabinet may offer
170 several slightly different variations, all of which perform very similar in regards to energy consumption.
171 Using this approach, EPA would accept data that is representative of the most energy consumptive
172 design at any one cabinet size within a given family. Model variations would need to share the same
173 internal cabinet basic design and volume to be qualified under the representative unit.
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175 EPA received several supporting comments regarding this approach. All stakeholders are
176 encouraged to provide feedback on whether additional clarification is needed regarding the family
177 qualification approach.
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181 B. Data Collection: Data shall be reported using Appendix X1: *Results Reporting Sheets* provided in
182 the ASTM F2140-10 test method.
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184 C. Registered/Rated Performance: Registered or rated performance data may be submitted for
185 inclusion on the consumer-facing ENERGY STAR qualified product list. This optional data
186 submission is in addition to the required submission of actual measured test data produced using
187 the test methods specified in this document. Registered or rated data shall meet all of the
188 requirements presented in this ENERGY STAR specification, and shall not represent an
189 improvement over tested product performance.
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191 **6) Effective Date:** The ENERGY STAR Commercial Hot Food Holding Cabinet specification shall go
192 into effect on **May 1, 2011**. To qualify with the energy efficiency criteria of ENERGY STAR, a product
193 model shall meet the ENERGY STAR specification in effect on the date of manufacture. The date of
194 manufacture is specific to each unit and is the date (e.g., month and year) on which a unit is
195 considered to be completely assembled.
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198 **7) Future Specification Revisions:** ENERGY STAR reserves the right to change the specification
199 should technological and/or market changes affect its usefulness to consumers, industry, or the
200 environment. In keeping with current policy, revisions to the specification are arrived at through
201 industry discussions. In the event of a specification revision, please note that the ENERGY STAR
202 qualification is not automatically granted for the life of a product model.
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