



# ENERGY STAR® Program Requirements Product Specification for Commercial Electric Cooktops

## Eligibility Criteria Draft 1 Version 1.0

Following is the **Draft 1 Version 1.0** product specification for ENERGY STAR certified commercial electric cooktops. 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. Commercial Electric Cooktop: A commercial cooking unit that provides direct heat to a cooking container (i.e., a pot or pan), or works with the cooking container to generate heat, which is transferred to the product within the cooking container. There are multiple variations of these devices which utilize electric resistance heating or electric inductive heating.

### **Cooktop Types**

- B. Cooktop Electric Element (Open Coil Cooktops): Open coil electrical elements supported to withstand the weight of filled cooking container.<sup>1</sup>
- C. Heavy-Duty Range: An appliance used for pot or pan surface cooking, griddling, frying, broiling, steaming, baking, roasting, and reheating food products with a standard oven or convection oven. It is of the most durable construction, varying in size, offers increased heat input than medium (restaurant) or specialty ranges. Typical industry widths are 32 in. (812 mm), 34 in. (863 mm), and 36 in. (914 mm) for electric ranges. The top cooking surface can be 1/3, 2/3, or full top options of any style noted.<sup>2</sup>
- D. French Top: Sheathed electric heating element with permanent cover over entire heating element; round and sealed to the range top to resist drips and splash.<sup>3</sup>
- E. Hot Top: Flat cast iron surface sometimes called a “boiling plate” or “uniform heat top” with heat transferred from electric heating elements under the cooking surface where pots are set to warm or keep hot food contained in the utensil.<sup>4</sup>
- F. Induction Cooktop: A commercial or institutional food cooking or warming device using magnetic induction as the heating energy source, which includes countertop, counter drop-in, and floor standing units.<sup>5</sup>
- a. Countertop (or Tabletop) Unit: An induction unit intended to be operated on a counter or table.<sup>6</sup>

<sup>1</sup> Modified definition from ASTM F-2521-09 (2022) *Standard Specification for Heavy-Duty Ranges, Gas and Electric*.

<sup>2</sup> Ibid.

<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

<sup>5</sup> ASTM F-2834-10a (2017) *Standard Specification for Induction Cooktops, Counter Top, Drop-in Mounted, or Floor Standing*.

<sup>6</sup> Ibid.

- 48 b. Counter Drop-In Unit: An induction unit intended to be installed in a counter top or  
49 application specific cut-out.<sup>7</sup>  
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51 c. Floor Standing Unit: An induction unit intended to be operated standing on the floor<sup>8</sup>.  
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54 ***Preheat Value***

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56 G. Measured Energy Input Rate: The amount of energy (at maximum control setting) to preheat  
57 and/or maintain the desired temperature of the water or food product within the cooking  
58 vessel.<sup>9</sup>  
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60 H. Heat-up Temperature Response: The temperature increase on the surface of a plate during the  
61 test period in accordance with the heat-up temperature-response test.<sup>10</sup>  
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63 ***Energy Efficiency Metric***

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65 I. Cooking Energy-Efficiency: Quantity of energy imparted to the specified load (20 lbs of water  
66 at 70°F to 200 °F), expressed as a percentage of energy consumed by the cooktop during the  
67 cooking (boil) event.<sup>11</sup> Also known as the “Cooking (Boil) Energy Efficiency” or “Boil Test”.  
68  
69 J. Production Capacity: Rate at which the commercial electric cooktop unit heats water in  
70 accordance with the cooking energy-efficiency test, expressed in pounds per hour (lbs/hr).<sup>12</sup>  
71  
72 K. Simmer Energy: A measurement of the cooktop efficiency while maintaining operational, or high  
73 steady-state, temperature (200 °F).  
74

75 ***Certification Terms***

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78 L. Cooking Container: A steel vessel used to hold the water being heated by the cooktop. The  
79 ASTM F1521-12 (2022) Section 6.3 dimensions for testing are 13in (330mm) diameter, 20qt  
80 (19L), sauce pot with matching lid. The bottom of the pot shall be flat to within 0.0625in (1.6mm)  
81 over the diameter.  
82  
83 M. Heat-Up Time: The time required to heat the allotted volume of water from 70°F to 200°F, per  
84 ASTM F1521-12 (2022).  
85  
86 N. Hob: An individual heating element or cooking zone that is independently controlled; typically  
87 associated with an individual induction coil<sup>13</sup>  
88  
89 O. Product Family: Individual models offered within a product line based on the same engineering  
90 design, including number of hobs, as applicable. Acceptable differences within a product family  
91 for purposes of certification include controls and any aesthetic additions that have no impact on  
92 the cooktop energy consumption in any operating mode(s).  
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94 P. Set-Back Mode (Off Mode): A feature that includes automatic temperature reduction after  
95 periods of non-use. In addition, the feature may also incorporate the reduction or elimination of  
96 energy consumption during periods of non-use.  
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<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

<sup>9</sup> ASTM F-1521-12 (2018) *Standard Test Methods for Range Tops*.

<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

<sup>13</sup> Modified definition from ASTM F-2834-10a (2017) *Standard Specification for Induction Cooktops, Counter Top, Drop-in Mounted, or Floor Standing*

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**Note:** Where applicable, EPA aligns the proposed terms and definitions in this specification with established, industry-accepted nomenclature. Specifically, EPA is proposing terms and definitions for Commercial Cooktops in Section 1.A., in addition to various *Cooktop Types*, in Section 1 B.-F., that derive from the American Society for Testing and Materials (ASTM) F2521-09 (2022) *Standard Specification for Heavy-Duty Ranges, Gas and Electric*; and ASTM F2834-10a (2017) *Standard Specification for Induction Cooktops, Counter Top, Drop-in Mounted, or Floor Standing*. In response to stakeholder feedback from the Discussion Guide and subsequent Discussion Guide Stakeholder Webinar EPA includes definitions for the different sub-categories of induction cooktops, which include countertop, drop-in, and floor standing units in Section 1.F.a.-c.

*Preheat Value* and *Energy Efficiency Metric* terms and definitions in Section 1 G.-K. derive from ASTM F1521-12 (2022) *Standard Test Methods for Performance of Range Tops*.

In Section 1 L.-P., EPA is also proposing additional *Certification Terms* with definitions including cooking container, heat-up time, hob, product family, and set-back mode for the purpose of certification and/or additional reporting requirement clarification. To ensure consistent and comparable test results among laboratories as well as certification and verification testing, the EPA proposes the ASTM cooking container to be steel and dimensions as written in ASTM F1521-12 (2022) Section 6.3.

Stakeholders are encouraged to provide feedback on these proposed terms and definitions and to offer suggestions for further clarification, if needed.

**2) Scope:**

- A. Included Products: Products that meet the definition of a commercial electric cooktop are eligible for ENERGY STAR certification.
  
- B. Excluded Products: Cooktops designed for residential or other non-commercial applications, including conventional cooking tops as defined by the U.S. Department of Energy (DOE) at Title 10 Code of Federal Regulations (CFR) 430.2, are not eligible for ENERGY STAR certification under this specification. Gas ranges/cooktops (i.e., gas hot tops and open top gas burners); griddles or planchas; soup wells; woks; dedicated warming/holding equipment; and other cooktop types that do not meet the criteria are ineligible for ENERGY STAR certification under this specification.

**Note:** Cooktops may be used for warming and/or holding but warming/holding equipment may not necessarily be used for cooking. For clarification purposes, EPA would be interested in setting a minimum input rate threshold expressed in kW for eligible electric cooktops that would differentiate from a warming/holding plate or other similar devices. EPA encourages stakeholder feedback on what the minimum input rate threshold could be or other ways to differentiate these product types.

EPA is interested in stakeholder feedback on the scope of this specification and if further clarification is necessary to differentiate eligible and ineligible products. The Agency also encourages manufacturers to continue to work with laboratories and other testing facilities to advance efforts to develop test procedures and create robust datasets for additional product categories.

**Certification Criteria:**

- C. Commercial Electric Cooktop Cooking (Boil)-Energy Efficiency Requirements:

Table 1: Energy Efficiency Requirements for Commercial Electric Cooktops	
Individual Hob Performance*	
Cooking (Boil) Energy Efficiency, %	≥ 80%

\* The ASTM F1521-12 (2022) test method indicates to start the test on the hob (or cooking unit/zone) closest to front and left (Section 10.4.2), then to repeat the test for each type of hob (or cooking unit/zone) on the range top (Section 10.4.11). The intent of the method is to test each hob individually. ENERGY STAR would take a weighted average of all hobs on the cooktop to determine certification.

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154 D. Significant Digits and Rounding:

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156 a. All calculations shall be carried out with directly measured (unrounded) values. Only the final  
157 result of a calculation shall be rounded.  
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159 b. Unless otherwise specified in this specification, compliance with certification criteria shall  
160 be evaluated using exact values without any benefit from rounding.  
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162 c. Cooking (Boil) Energy Efficiency: Calculated values that are submitted for reporting on the  
163 ENERGY STAR website shall be rounded to the nearest significant digit as expressed in the  
164 certification criteria.  
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166 **Note:** EPA received cooking (boil) energy efficiency and production capacity data from Southern California  
167 Edison (SCE) that based exploratory testing on the most current ASTM F1521-12 standard test method  
168 (i.e., as balloted in October 2022) with some deviations such as the size of the pot (4-quart steel pot) and  
169 electric cooktop testing (i.e., limited to one and two-hob units; testing one hob due to similar power ratings  
170 in two-hob units). The energy performance differentiation in the dataset ranged from approximately 74% -  
171 87%, with production capacities ranging from about 8 – 23 lbs of water per hour, based on heat-up time  
172 from 70°F to 200°F.  
173

174 Based on the dataset, the Agency is proposing minimum cooking (boil) energy efficiency criteria of 80%  
175 (see Table 1) which will recognize products that are the best performers related to energy efficiency  
176 among electric units and are offered by multiple manufacturers and brands.  
177

178 Although minimum energy efficiency levels are of interest for different sub-categories of induction units  
179 (i.e., countertop, drop-in, and floor standing), stakeholders have suggested that energy performance does  
180 not differ across these sub-types. Therefore, EPA proposes a single set of criteria for all eligible  
181 commercial electric cooktops at this time and will revisit sub-categories once additional energy  
182 performance data are collected.  
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184 EPA is interested in stakeholder feedback on the proposed certification requirements.  
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188 **3) Test Requirements:**

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190 A. To ensure only commercial electric cooktops certify under this specification, products shall be third-  
191 party certified to NSF/ANSI Standard 4, *Commercial Cooking, Rethermalization and Powered Hot*  
192 *Food Holding and Transport Equipment*.  
193

194 **Note:** Eligible products for this Version 1.0 specification include commercial electric cooktops that are  
195 third-party certified to NSF/ANSI Standard 4, *Commercial Cooking, Rethermalization and Powered Hot*  
196 *Food Holding and Transport Equipment*.  
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- 199 B. Representative models shall be selected for testing per the following requirements:

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201 a. For certification of an individual product model, the representative model shall be equivalent  
202 to that which is intended to be marketed and labeled as ENERGY STAR.  
203  
204 b. For certification of a product family, any model within that product family may be tested and  
205 serve as the representative model. When submitting product families, manufacturers continue  
206 to be held accountable for any efficiency claims made about their products, including those not  
207 tested or for which data was not reported.

- 208  
209 C. When testing commercial electric cooktops, the following test method shall be used to determine  
210 ENERGY STAR certification.  
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Table 2: Test Method for ENERGY STAR Certification		
Cooktop Category	ENERGY STAR Requirement	Test Method Reference
Commercial Electric Cooktops	Cooking (Boil) Energy Efficiency	ASTM F1521-12 (2022) <i>Standard Test Methods for Performance of Range Tops.</i>

- 212  
213 D. For electric cooktops with dual voltage, multiple voltage-versatility and for those that are  
214 available in different voltage configurations, the cooktop shall be evaluated as separate  
215 appliances in accordance with ASTM F1521-12 (2022), see Section 9.4.  
216  
217 E. Additional Reporting Requirements:  
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219 a. The total number of hobs in the cooktop.  
220 b. The maximum input rate of each hob.  
221 c. The diameter(s) of the individual hobs.  
222 d. Heat-up time (in minutes) for each hob from ambient to production-ready temperature (70°F  
223 to 200°F).  
224 e. Production capacity (lbs. of water per hour)  
225 f. For induction cooktops, specify the sub-category of the unit (countertop, drop-in, and/or  
226 floor standing), if applicable.  
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228 **Note:** In 2021, the Agency requested stakeholder feedback on whether the ASTM sauté and simmer tests  
229 might be included in the ENERGY STAR specification to differentiate energy performance among  
230 cooktops. Some stakeholders supported incorporating these tests, while others objected to including them  
231 noting that the boil test may be the most representative approach. In other words, some stakeholders  
232 indicated that the proposed sauté and simmer test methods may not be representative of how cooktops  
233 are commonly used in the field.  
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235 More importantly, consistent performance data in other operating methods (i.e., simmer or sauté) for  
236 evaluation are not available and setting performance criteria for these food preparation methods is not  
237 possible at this point. Therefore, EPA has decided not to include the simmer and sauté criteria at this time  
238 and will continue to monitor the progress and refinement of these additional cooking methods via ongoing  
239 ASTM F26 participation.  
240

241 EPA will proceed with adopting the referenced ASTM F1521-12 standard test method (as balloted in  
242 October 2022) in Table 2 to evaluate cooking (boil) energy efficiency to differentiate energy performance.  
243 In the event the current ASTM F1521-12 (2022) standard is superseded with an updated version, EPA will  
244 update standard references in this specification to align with the most current standard(s).  
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#### 246 **Voltage**

247 Commercial electric cooktops are available in various voltage ratings in the U.S., most commonly: 120V,  
248 208V, and 240V, based on the available performance data and initial market research. In the event an  
249 eligible commercial electric cooktop is available in more than one voltage configuration or if a unit has  
250 multiple voltage-versatility, EPA proposes the cooktop be evaluated as separate appliances in accordance  
251 with ASTM F1521-12 test method (as balloted in October 2022), per note in Section 9.4.  
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#### 253 **Additional Reporting Requirements**

254 In addition to achieving the minimum cooking (boil) energy efficiency requirement, EPA has proposed  
255 additional reporting requirements in Section E.a.-f. that include number of hobs per unit, maximum input  
256 rates, diameter(s) of individual hobs, heat-up time of each hob, production capacity, and sub-category of  
257 commercial induction cooktops. This is for informational purposes only and may be included in the  
258 ENERGY STAR Product Finder, as appropriate, for the benefit of the end-users in their purchase decision-  
259 making processes.  
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Stakeholders are encouraged to provide feedback on the proposed test requirement, including the referenced ASTM standard test method, approach to addressing multiple voltage configurations, and the additional reporting requirements.

**4) Effective Date:** This ENERGY STAR Commercial Electric Cooktops specification will become effective immediately following publication of the final Version 1 specification. To certify 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:** EPA anticipates finalizing this Version 1 specification in early 2023. Upon finalization, manufacturers will be able to immediately begin certifying products.

**5) 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 ENERGY STAR certification is not automatically granted for the life of a product model.