ENERGY STAR® Program Requirements Product Specification for Residential Electric Cooking Products

Eligibility Criteria Draft 1 Version 1.0

Following is the **Draft 1 Version 1.0** product specification for ENERGY STAR certified residential electric cooking products. A product shall meet all of the identified criteria to earn the ENERGY STAR.

1. DEFINITIONS:

A. Active mode[1]: a mode in which the product is connected to a mains power source, has been activated, and is performing the main function of producing heat by means of electric resistance heating or electric inductive heating.

B. Basic model[2]: 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.

C. Combined electric cooking product[1]: a household cooking appliance that combines an electric cooking product with other appliance functionality, which may or may not include another cooking product. Combined electric cooking products include the following products: conventional electric range, microwave/conventional electric cooking top, microwave/conventional electric oven, and microwave/conventional electric range.

D. Combined low-power mode[3] the aggregate of available modes other than active mode, but including the delay start mode portion of active mode.

E. Conventional electric cooking top[2]: a category of cooking products which is a household cooking appliance consisting of a horizontal surface containing one or more surface units that utilize electric resistance heating or electric inductive heating. This includes any conventional electric cooking top component of a combined electric cooking product.

F. Cooking area[1]: an area on a conventional electric cooking top surface heated by an inducted magnetic field where cookware is placed for heating, where more than one cookware item can be used simultaneously and controlled separately from other cookware placed on the cooking area, and that may or may not include limitative markings.

G. Cooking zone[1]: a part of a conventional electric cooking top surface that is either a single electric resistance heating element, multiple concentric sizes of electric resistance heating elements, or an inductive heating element that is defined by limitative markings on the surface of the electric cooking top and can be controlled independently of any other cooking area or cooking zone.

H. Inactive mode[3]: a standby mode that facilitates the activation of active mode by remote switch (including remote control), internal sensor, or timer, or that provides continuous status display.

[1] Modified from 10 CFR 430, Subpart B, Appendix I1 for ENERGY STAR's purposes

[2] Modified from 10 CFR 430 Subpart A, Section 430.2 for ENERGY STAR's purposes

[3] 10 CFR 430, Subpart B, Appendix I1

I. Integrated Annual Energy Consumption (IAEC): the sum of the conventional electric cooking top annual active mode energy consumption and the annual combined low-power mode energy consumption of a conventional electric cooking top or any conventional electric cooking top component of a combined electric cooking product.

J. Multi-ring cooking zone[4]: a cooking zone on a conventional electric cooking top with multiple concentric sizes of electric resistance heating elements.

K. Off mode[5]: any mode in which a product is connected to a mains power source and is not providing any active mode or standby function, and where the mode may persist for an indefinite time. An indicator that only shows the user that the product is in the off position is included within the classification of an off mode.

L. Portable conventional electric cooking top: a conventional electric cooking top designed to be moved from place to place.

M. Smoothened water temperature[5]: the 40-second moving-average temperature as calculated in 10 CFR 430, Subpart B, Appendix I1 according to Section 7.5.4.1 of IEC 60350-2, rounded to the nearest 0.1 degree Celsius.

N. Specialty cooking zone[5]: a warming plate, grill, griddle, or any cooking zone that is designed for use only with non-circular cookware, such as a bridge zone. Specialty cooking zones are not tested as part of 10 CFR 430, Subpart B, Appendix I1.

O. Standby mode[5]: any mode in which a product is connected to a mains power source and offers one or more of the following user-oriented or protective functions which may persist for an indefinite time:

(1) Facilitation of the activation of other modes (including activation or deactivation of active mode) by remote switch (including remote control), internal sensor, or timer;

(2) Provision of continuous functions, including information or status displays (including clocks) or sensor-based functions. A timer is a continuous clock function (which may or may not be associated with a display) that allows for regularly scheduled tasks and that operates on a continuous basis.

P. Time t_{90}[5]: the first instant during the simmering test for each cooking zone at which the smoothened water temperature is greater than or equal to 90°C.

Note: EPA aligned with definitions provided in the DOE test procedure final rule published on August 22, 2022.

2. SCOPE:

Included Products: Products that meet the definition of a conventional electric cooking top are eligible for ENERGY STAR certification. The following product types are eligible for ENERGY STAR certification:

- Electric cooking top component of conventional electric ranges (a combined electric cooking product)
- Standalone conventional electric cooking tops (including portable conventional electric cooking tops)

Excluded Products: The following product types are ineligible for ENERGY STAR certification under

[4] Modified from 10 CFR 430, Subpart B, Appendix I1 for ENERGY STAR's purposes
[5] 10 CFR 430, Subpart B, Appendix I1

this specification:

- Commercial or other non-residential products
- Combined cooking products that include a microwave oven component (*i.e.*, microwave/conventional electric cooking top, microwave/conventional oven, and microwave/conventional electric range)
- Gas cooking tops, ranges, or standalone ovens
- Griddles

Note: Eligible products for the Version 1.0 specification include electric cooking top components of conventional electric ranges as well as standalone conventional electric cooking tops. Portable conventional electric cooking tops are expected to meet the same IAEC values as standalone products. EPA is interested in stakeholder feedback on the scope of this specification and if further clarification is necessary to differentiate eligible and ineligible products.

3. CERTIFICATION CRITERIA:

A. Energy Use Requirement:

Table 1: Energy Use Requirement for Standalone Conventional Electric Cooking Tops	
IAEC	≤ 190 kWh/yr

Table 2: Energy Use Requirements for Combined Electric Cooking Products	
IAEC	≤ 190 kWh/yr
$E_{TLP,O}$*	≤ 7 kWh/yr
* $E_{TLP,O}$ is the annual combined low-power mode energy consumption of the conventional electric oven component of a combined electric cooking product and is calculated in kWh/year as follows: $E_{TLP,O} = [(P_{IA} \times F_{IA}) + (P_{OM} \times F_{OM})] \times K \times S_{TOT} \times H_O$ Where: P_{IA}, F_{IA}, P_{OM}, F_{OM}, K, S_{TOT} are as defined in Section 4.2.2 of 10 CFR 430, Subpart B, Appendix I1 H_O is equal to 40% for conventional electric ranges.	

B. Significant Digits and Rounding:

1) All calculations shall be carried out with directly measured (unrounded) values. Only the final result of a calculation shall be rounded.

2) The IAEC specification limit shall be rounded off to the nearest kWh per year. If the calculation is halfway between the nearest two kWh per year values, the IAEC shall be rounded up to the higher of these values.

C. Model Numbers: Model numbers used for ENERGY STAR certified product submissions shall be consistent with any Federal Trade Commission (FTC) and Department of Energy (DOE) submissions.

Note: Electric cooking is present in 60% of U.S. homes according to the 2020 Residential Energy Consumption Survey (RECS). Momentum has rapidly built around the expansion of electric cooking, with city and state policymakers, manufacturers, and retailers eager for these products to grow their market presence. With this in mind, EPA seeks to establish an ENERGY STAR specification that recognizes electric models that deliver on energy efficiency without compromising performance. EPA is proposing an energy consumption requirement with this ENERGY STAR Residential Electric Cooking Products Version 1.0, Draft 1 and several reporting requirements including time to boil (see Section 4.C of this document).

As part of the Draft 1 development, EPA evaluated test data for nearly 30 electric products. The IAEC level proposed in Draft 1 is 16% more efficient than the highest energy consuming product within the test data. This specification aims to highlight the most efficient electric models, including induction, electric resistance, and coil, on the market.

EPA is sharing the data set associated with this proposal. This package relies on the best available data at this time. While we have limited data with which to perform a payback analysis at this stage, EPA did find examples of similarly featured products at the baseline performance and at the ENERGY STAR proposed level at comparable prices. EPA encourages interested utility parties to outline what information would be useful in creating incentive programs for residential cooking products.

The $E_{TLP,O}$, or the annual combined low-power mode energy consumption, of the conventional electric oven component of a combined electric cooking product can be calculated using the same test data collected as part of performing the test procedure in Section 3.2. of 10 CFR 430, Subpart B, Appendix I1. Section 4.2.2 of 10 CFR 430, Subpart B, Appendix I1, which calculates the annual combined low-power mode energy consumption of the conventional cooking top component of a combined cooking product, defines H_C = 60% as the percentage of hours per year assigned to the conventional cooking top component of a combined cooking product. Therefore, EPA defines H_O = 40%, as the percentage of hours per year assigned to the conventional electric oven component of a conventional electric range. EPA includes a criterion based on the $E_{TLP,O}$ of a combined electric cooking product (*i.e.*, a conventional electric range) and a reporting requirement of the E_{TLP}, or annual combined low-power mode energy consumption of the conventional electric cooking top component of a combined electric cooking product (*i.e.,* a conventional electric range; see Section 4.C of this document).

4. TEST REQUIREMENTS:

A. One of the following sampling plans shall be used to test energy performance for certification to ENERGY STAR:

   1) A representative unit shall be selected for testing based on the definition for basic model provided in Section 1 of this specification; or

   2) Units shall be selected for testing per the sampling requirements defined in 10 CFR § 429.23 for cooking products.

B. When testing energy consumption of residential cooking tops, the following test methods shall be used to determine ENERGY STAR certification:

Table 3: Test Method for ENERGY STAR Certification

Cooking Product Category	ENERGY STAR Requirement	Test Method Reference
Standalone Conventional Electric Cooking Tops and Conventional Electric Ranges	Integrated Annual Energy Consumption (IAEC) (kWh/year)	10 CFR 430, Subpart B, Appendix I1 - Uniform Test Method for Measuring the Energy Consumption of Conventional Cooking Products
Conventional Electric Ranges	Annual combined low-power mode energy consumption of the conventional electric oven component of a combined electric cooking product ($E_{TLP,O}$) (kWh/year)	Methodology in 10 CFR 430, Subpart B, Appendix I1 - Uniform Test Method for Measuring the Energy Consumption of Conventional Cooking Products Formulas in Section 3.A. Table 2 of this document.

C. Additional Reporting Requirements:

   1) The total number of cooking zones in the cooking top.
   2) The maximum input rate of each cooking zone.

3) The size[6] of each cooking zone.
4) Time t_{90} (in seconds) for each cooking zone.
5) Annual combined low-power mode energy consumption (E_{TLP}) of the conventional electric cooking top component of a combined electric cooking product (*i.e.*, a conventional electric range)
6) Cooking top type (*i.e.*, coil, radiant, induction)
7) Cooking top configuration (*i.e.*, part of a combined electric cooking product or standalone)

Note: For this specification, EPA is referencing the DOE test procedure for cooking products, Appendix I1. EPA includes the same sampling plans used for other ENERGY STAR appliances. EPA is including additional reporting requirements for consumer benefit when comparing ENERGY STAR certified products once available.

5. EFFECTIVE DATE:

A. Effective Date: This ENERGY STAR Residential Electric Cooking Products specification will become effective immediately following publication of the final Version 1.0 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.

B. 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.

[6] Section 3.1.1.1.1 of 10 CFR 430, Subpart B, Appendix I1