



ENERGY STAR® Program Requirements Product Specification for Commercial Fryers

Eligibility Criteria DRAFT 2: Version 2.0

Following is the **DRAFT 2** Version 2.0 product specification for ENERGY STAR qualified commercial fryers. 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 Open, Deep-Fat Fryer: An appliance, including a cooking vessel, in which oil is placed to such a depth that the cooking food is essentially supported by displacement of the cooking fluid rather than by the bottom of the vessel. Heat is delivered to the cooking fluid by means of an immersed electric element or band-wrapped vessel (electric fryers), or by heat transfer from gas burners through either the walls of the fryer or through tubes passing through the cooking fluid (gas fryers).
 - a. Standard Fryer: A fryer with a vat that measures ≥ 14 inches and < 18 inches wide, and a shortening capacity ≥ 25 pounds and < 60 pounds.
 - b. Split Vat Fryer: A standard fryer with an internal wall that separates the vat into two equal sides.
 - c. Large Vat Fryer: A fryer with a vat that measures ≥ 18 inches and ≤ 24 inches wide, and a shortening capacity > 50 pounds.

Note: EPA received a comment that standard fryers offer a range in shortening capacity that could overlap with the previous definition for large vat fryers, which included a ceiling of 50 pounds. To provide additional clarification regarding the category in which these types of standard fryer designs would fall, EPA proposes raising the maximum shortening capacity for standard fryers to less than 60 pounds. EPA also proposes clarifying the vat measurements for purposes of classifying standard and large vat fryers based on width. Based on industry discussions, EPA has found that purchasing decisions are made primarily based on width. Stakeholders are encouraged to provide feedback on whether the definitions for standard and large vat fryers are representative of available product and effective in delineating these two categories. In addition, EPA is interested in hearing from manufacturers whether additional guidance is needed to determine shortening capacity.

As defined above, open-vat kettle fryers fall within the scope of this specification. These fryer types often compete with rectangular large vat fryers and can be tested under the same ASTM test standard referenced in Section 4, below. To determine vat size, EPA proposes measuring the diameter of the cylinder. Stakeholders are encouraged to provide feedback on the inclusion of these product types.

- B. Cooking Energy Efficiency: The quantity of energy input to the food product (i.e., french fries) during the cooking process; expressed as a percentage of the quantity of energy input to the fryer during the heavy-, medium-, and light-load tests. For purposes of this specification, the heavy-load test as defined in ASTM F1361-07 and ASTM F2144-07 will be used as a measurement of cooking energy efficiency.
- C. Idle Energy Rate: The average rate of energy consumed [Btu/h (kJ/h) or kW] by the fryer while “holding” or “idling” the frying medium at the thermostat(s) set point.
- D. Product Family: Variations of one model are offered within a single product line with differences in aesthetics only. Individual models represented by a product family must be based on the same basic engineering design and have the same cooking energy efficiency and idle energy rate. All

members of the family must also have the same fry pot size.

2) Scope:

- A. Included Products: Products that meet the definition of a Commercial Open Deep-Fat Fryer as specified herein are eligible for ENERGY STAR qualification, with the exception of products listed in Section 2.B. Countertop and floor type designs are eligible to qualify for ENERGY STAR.
- B. Excluded Products: Fryers with vats measuring < 14 inches wide, or > 24 inches wide, are not eligible for ENERGY STAR.

Note: EPA received a request to further clarify the scope of the specification based on the different names used for marketing fryers such as kettle fryers, pressure fryers, flat bottomed fryers, and ventless fryers. When determining whether a product type falls within the scope of an ENERGY STAR specification, EPA reviews the scope of the referenced test procedure and the definitions provided in Section 1. For example, pressure fryers are automatically excluded based on the ASTM test standards and definition 1.A for open deep-fat fryer. It is not EPA's intent to list and define every product type, design, or technology available in the marketplace, which would not be inclusive and could change over time. Where deemed appropriate, EPA will include additional parameters in Section 2 to further define scope but largely relies on the relevant ASTM test standards to provide this clarification.

EPA received a proposal to set higher idle energy rates for fryers larger than 18 inches wide. While EPA understands the relationship between increasing surface area and inherent heat loss, there is limited data available to determine appropriate levels. In addition, there are at least two 20-inch gas fryers and one 24-inch electric fryer in EPA's dataset that could meet the Version 2.0 requirements and other large vat models that are close to meeting the requirements. While the levels presented in this Version 2.0 specification were developed based on 18-inch performance, which represents the bulk of the dataset, EPA believes that manufacturers offering high efficiency fryers between 18 and 24 inches should be recognized for their efforts. Based on the limited data for fryers measuring larger than 24 inches, EPA cannot make a determination regarding inclusion at this time. It is also our understanding that by including 18 – 24 inch fryers, EPA is capturing the majority of large vat fryers available in the marketplace. Upon receipt of additional data, EPA may decide to add these product types to the specification at a later date.

3) Qualification Criteria:

- A. Determining Fry Pot Size: The frying area shall be measured at the fryer's maximum fill-line. The frypot width is considered to be the distance between the inner side walls of the frypot. The frypot length is considered to be the distance between the front edge and the rear of the frypot at the fryer's maximum fill line. The dimensions for split vat fryers shall be considered to be twice the width of one side.
- B. Cooking Energy Efficiency and Idle Energy Rate Requirements – Standard and Split Vat Fryers

Table 1: Energy Efficiency Requirements for Standard Open Deep-Fat Gas Fryers

Heavy-Load Cooking Energy Efficiency	≥ 50%
Idle Energy Rate	≤ 9,000 Btu/hr

Table 2: Energy Efficiency Requirements for Standard Open Deep-Fat Electric Fryers

Heavy-Load Cooking Energy Efficiency	≥ 80%
Idle Energy Rate	≤ 1000 watts

C. Cooking Energy Efficiency and Idle Energy Rate Requirements – Large Vat Fryers

Table 3: Energy Efficiency Requirements for Large Vat Open Deep-Fat Gas Fryers	
Heavy-Load Cooking Energy Efficiency	$\geq 50\%$
Idle Energy Rate	$\leq 12,000$ Btu/hr

Table 4: Energy Efficiency Requirements for Large Vat Open Deep-Fat Electric Fryers	
Heavy-Load Cooking Energy Efficiency	$\geq 80\%$
Idle Energy Rate	$\leq 1,100$ watts

Note: Some stakeholders raised concern that the Draft 1 proposed levels for large vat gas fryers of 11,000 Btu/hr idle energy rate were too stringent and seemed to favor technologies generally found in higher end fryers. In response, EPA revisited the dataset and upon closer review discovered that the Draft 1 levels largely excluded slightly less efficient, but more traditional technologies. Using this new idle energy level, paybacks for filtered and non-filtered gas designs remain reasonable. A modest increase in the idle energy rate to 12,000 Btu/hr would provide a broader selection of products across several technology options and price points. EPA also believes that a level at 12,000 Btu/hr continues to provide significant differentiation in the marketplace and savings to the end user.

EPA received similar concerns regarding the proposed electric levels for large vat fryers but found a tighter spread of efficiencies in the dataset and less of a discrepancy in technologies offered. Therefore, EPA is proposing to keep the 1,100 watts idle energy rate for large vat fryers initially presented in the previous Draft 1 version.

D. Significant Digits and Rounding:

- 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 nearest significant digit as expressed in the corresponding specification limit.
- b. Unless otherwise specified, compliance with specification limit shall be evaluated using exact values without any benefit from rounding.

4) **Test Criteria:**

A. Representative Models shall be selected for testing per the following requirements:

- a. For qualification of an individual product model, the representative model shall be equivalent to that which is intended to be marketed and labeled as ENERGY STAR.
- b. For qualification of a product family, any model within that product family can be tested and serve as the representative model.

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2 B. When testing commercial fryers, the following test methods shall be used to determine ENERGY
3 STAR qualification:
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Table 5: Test Methods for ENERGY STAR Qualification	
ENERGY STAR Requirement	Test Method Reference
Cooking Energy Efficiency	ASTM Standard F1361-07, <i>Test Method for the Performance of Open Deep Fat Fryers (standard fryers)</i> OR ASTM Standard F2144-07, <i>Test Method for Performance of Large Open Vat Fryers (large vat fryers)</i>
Idle Energy Rate	

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7 **5) Effective Date:** The ENERGY STAR Commercial Fryer specification shall take effect on **April 15,**
8 **2011.** To qualify for ENERGY STAR, a product model shall meet the ENERGY STAR specification in
9 effect on the model's date of manufacture. The date of manufacture is specific to each unit and is the
10 date (e.g., month and year) on which a unit is considered to be completely assembled
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12 **Note:** EPA is proposing a new effective date of April 15, 2011 for large vat commercial fryers. EPA
13 expects to release a Final Draft version for review and comment and finalize the Version 2.0 specification
14 by this proposed new date.
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16 As of April 15, manufacturers can begin submitting their large vat fryers for ENERGY STAR qualification.
17 Please note that to earn ENERGY STAR qualification manufacturers must have their products third-party
18 certified by an EPA-recognized Certification Body (CB) to the Version 2.0 requirements.
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20 As of August 1, 2011 all **previously qualified** standard fryers seeking ENERGY STAR qualification must
21 be third-party certified by an EPA-recognized CB in order to remain ENERGY STAR labeled and qualified.
22 All manufacturers are encouraged to contact EPA-recognized laboratories and CBs now to prepare for
23 certification of their products. For more information, including FAQs and a list of EPA-recognized
24 laboratories and CBs, visit www.energystar.gov/3rdpartycert.
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- 26 **6) Future Specification Revisions:** EPA reserves the right to change the specification should
27 technological and/or market changes affect its usefulness to consumers, industry, or the environment.
28 In keeping with current policy, revisions to the specification are arrived at through industry
29 discussions. Please note that ENERGY STAR qualification is not automatically granted for the life of
30 the product model.
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