

High Efficiency Specifications for Commercial Fryers

Effective Date 1/6/2012
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Efficiency Requirements for Qualifying Products

Equipment	Corresponding Base Specification	Heavy Load (French Fry) Cooking Energy Efficiency	Idle Energy Rate
Natural Gas Standard Open, Deep-Fat Fryers	ENERGY STAR®	≥ 50 %	≤ 9,000 Btu/hr
Electric Standard Open, Deep-Fat Fryers	ENERGY STAR	≥ 80 %	≤ 1,000 watts
Natural Gas Large Vat Open, Deep-Fat Fryers	ENERGY STAR	≥ 50 %	≤ 12,000 Btu/hr
Electric Large Vat Open, Deep-Fat Fryers	ENERGY STAR	≥ 80 %	≤ 1,100 watts

Definitions

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 ≥12 inches and < 18 inches wide, and a shortening capacity ≥25 pounds and ≤65 pounds.

b. Large Vat Fryer: A fryer with a vat that measures ≥18 inches and ≤24 inches wide, and a shortening capacity > 50 pounds.

c. Split Vat Fryer: A standard or large vat fryer with an internal wall that separates the vat into two equal sides.

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 and ASTM F2144 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.

Qualifying Products

A. Included Products: Products that meet the definition of a Commercial Open Deep-Fat Fryer as specified herein are eligible for qualification, with the exception of products listed in the excluded products section below. Countertop and floor type designs are eligible to qualify.

B. Excluded Products: Fryers with vats measuring < 12 inches wide, or > 24 inches wide, are not eligible for qualification.

C. 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 dimensions for split vat fryers shall be considered to be twice the width of one side. For kettle fryers, the frying area shall be measured at the fryer’s maximum fill-line using the diameter of the cylinder and determined by the inner walls.

D. Significant Digits and Rounding:

- a. All calculations shall be carried out with directly measured (unrounded) values.
- b. Unless otherwise specified, compliance with specification limits shall be evaluated using directly measured or calculated values without any benefit from rounding.

E. Maintenance of a Qualifying Products List

To support CEE members in identifying models meeting the performance requirements of this specification, CEE maintains and updates on a quarterly basis a qualifying products list. CEE gathers fryer energy performance data from the EPA ENERGY STAR program and the Food Service Technology Center (FSTC). Manufacturers wishing to qualify their products must submit performance data to one or both of these organizations.

Test Methods

In measuring cooking energy efficiency and idle energy rate, the following test methods must be used: American Society for Testing and Materials (ASTM) F1361, *Test Method for Performance of Open, Deep-Fat Fryers (standard fryers)* OR ASTM F2144, *Test Method for Performance of Large Open Vat Fryers (large vat fryers)*.

Future Specification Revisions

CEE reserves the right to revise the specification as appropriate.