



ENERGY STAR® Program Requirements Product Specification for Commercial Dishwashers

Eligibility Criteria Version 2.0

Following is the **Version 2.0** product specification for ENERGY STAR qualified commercial dishwashers. A product shall meet all of the identified criteria if it is to earn the ENERGY STAR.

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

- A. **Dishwashing Machine**: A machine designed to clean and sanitize plates, pots, pans, glasses, cups, bowls, utensils, and trays by applying sprays of detergent solution (with or without blasting media granules) and a sanitizing rinse.

Machine Types

- B. **Stationary Rack Machine**: A dishwashing machine in which a rack of dishes remains stationary within the machine while subjected to sequential wash and rinse sprays. This definition also applies to machines in which the rack revolves on an axis during the wash and rinse cycles.
- a) **Under Counter**: A stationary rack machine with an overall height of 38 inches or less, designed to be installed under food preparation workspaces. Under counter dishwashers can be either chemical or hot water sanitizing, with an internal or external booster heater for the latter.
- b) **Single Tank, Door Type**: A stationary rack machine designed to accept a standard 20 inch x 20 inch dish rack which requires the raising of a door to place the rack into the wash/rinse chamber. Closing of the door typically initiates the wash cycle. Subcategories of single tank, stationary door type machines include: single rack, double rack, pot, pan and utensil washers, chemical dump type and hooded wash compartment (“hood type”). Single tank, door type models can be either chemical or hot water sanitizing, with an internal or external booster heater for the latter.
- c) **Pot, Pan, and Utensil**: A stationary rack, door type machine designed to clean and sanitize pots, pans, and kitchen utensils.
- d) **Glasswashing**: A stationary rack, under counter machine specifically designed to clean and sanitize glasses.
- C. **Conveyor Machine**: A dishwashing machine that employs a conveyor or similar mechanism to carry dishes through a series of wash and rinse sprays within the machine.
- a) **Single Tank Conveyor**: A conveyor machine that includes a tank for wash water followed by a sanitizing rinse (pumped or fresh water). This type of machine does not have a pumped rinse tank. This type of machine may include a prewashing section ahead of the washing section and an auxiliary rinse section, for purposes of reusing the sanitizing rinse water, between the power rinse and sanitizing rinse sections. Single tank conveyor dishwashers can be either chemical or hot water sanitizing, with an internal or external booster heater for the latter.
- b) **Multiple Tank Conveyor**: A conveyor type machine that includes one or more tanks for wash

¹ Additional terms found throughout this document, and related to machine components and operation, are defined in NSF 170-2010.

water and one or more tanks for pumped rinse water, followed by a sanitizing rinse. This type of machine may include a pre-washing section before the washing section and an auxiliary rinse section, for purposes of reusing the sanitizing rinse water, between the power rinse and sanitizing rinse section. Multiple tank conveyor dishwashers can be either chemical or hot water sanitizing, with an internal or external booster heater for the latter.

- c) Flight Type Conveyor: A conveyor machine where the dishes are loaded directly on the conveyor rather than transported within a rack. This machine is also referred to as a rackless conveyor.

Sanitation Methods

- D. Hot Water Sanitizing (High Temp) Machine: A machine that applies hot water to the surfaces of dishes to achieve sanitization.
- E. Chemical Sanitizing (Low Temp) Machine: A machine that applies a chemical sanitizing solution to the surfaces of dishes to achieve sanitization.
- F. Chemical Dump Type Machine: A low temp, stationary rack machine with a pumped recirculated sanitizing rinse.
- G. Dual Sanitizing Machine: A machine designed to operate as either a high temp or low temp machine.

Modes and Metrics

- H. Wash Mode: For stationary rack machines, the dishwasher is in wash mode when it is actively running a cycle and is spraying wash water (i.e., water that is neither part of the sanitizing rinse, post sanitizing rinse, nor the prewashing unit).
- I. Rinse Mode: For stationary rack machines, the dishwasher is in rinse mode when it is at the end of the actively running cycle and is spraying hot water or chemical sanitizing rinse water or a post-sanitizing rinse. If there is a post-sanitizing rinse, it shall be included in rinse mode.
- J. Dwell Mode: For stationary rack machines, the dishwasher is in dwell mode when it is actively running a cycle but is not in wash or rinse modes.
- K. Idle Mode: For all dishwasher types, the dishwasher is in idle mode when it is not actively running but is still powered on and ready to wash dishes at the required temperature.
- L. Energy Saver Mode: A dishwasher is in energy saver mode if the dishwasher is manually converted or, after inactivity, the dishwasher automatically converts to a setting that consumes less energy than it does in idle mode (not all dishwashers have this feature).
- M. Idle Energy Rate: The rate of energy consumed by the dishwasher while “holding” or maintaining wash tank water at the thermostat(s) set point during the time period specified in the ENERGY STAR Test Method for Commercial Dishwashers (Rev. May-2012).

Qualification Terms

- N. Product Family: Variations of one model offered within a single product line with design differences limited to: finish/color; length of pre-wash section, voltage, and orientation (e.g., corner, straight through models). Individual models represented by a product family must have the same sanitizing and post sanitizing rinse water and idle energy consumption.

2) **Scope:**

- A. Included Products: Products that meet the definition of a Commercial Dishwasher as specified herein are eligible for ENERGY STAR qualification, with the exception of products listed in Section 2.B. The following product types are eligible: under counter; single tank, door type; single tank conveyor; multiple tank conveyor and flight type machines. Glasswashing machines; pot, pan, and utensil machines; and dual sanitizing machines are also eligible. Only those under counter machines designed for wash cycles of 10 minutes or less are eligible for ENERGY STAR. This Version 2.0 specification only covers electric models.
- B. Excluded Products: Dishwashers intended for use in residential or laboratory applications are not eligible for ENERGY STAR under this product specification. Steam, gas, and other non-electric models cannot qualify for ENERGY STAR under this Version 2.0.

3) **Qualification Criteria:**

A. Energy and Water Efficiency Requirements:

Table 1: ENERGY STAR Requirements for Commercial Dishwashers				
Machine Type	High Temp Efficiency Requirements		Low Temp Efficiency Requirements	
	Idle Energy Rate*	Water Consumption**	Idle Energy Rate*	Water Consumption**
Under Counter	≤ 0.50 kW	≤ 0.86 GPR	≤ 0.50 kW	≤ 1.19 GPR
Stationary Single Tank Door	≤ 0.70 kW	≤ 0.89 GPR	≤ 0.60 kW	≤ 1.18 GPR
Pot, Pan, and Utensil	≤ 1.20 kW	≤ 0.58 GPSF	≤ 1.00 kW	≤ 0.58 GPSF
Single Tank Conveyor	≤ 1.50 kW	≤ 0.70 GPR	≤ 1.50 kW	≤ 0.79 GPR
Multiple Tank Conveyor	≤ 2.25 kW	≤ 0.54 GPR	≤ 2.00 kW	≤ 0.54 GPR
Single Tank Flight Type	Reported	GPH ≤ 2.975x + 55.00	Reported	GPH ≤ 2.975x + 55.00
Multiple Tank Flight Type	Reported	GPH ≤ 4.96x + 17.00	Reported	GPH ≤ 4.96x + 17.00

* Idle results should be measured with the **door closed** and represent the total idle energy consumed by the machine including all tank heater(s) and controls. Booster heater (internal or external) energy consumption should not be part of this measurement unless it cannot be separately monitored per the ENERGY STAR Test Method referenced in Section 4, below.

** GPR = gallons per rack; GPSF = gallons per square foot of rack; GPH = gallons per hour; x = sf of conveyor belt (i.e., W*L) /min (max conveyor speed).

- B. User-Adjustable Conveyor Machines: Conveyor machines that offer multiple speeds adjustable by the end user must meet the ENERGY STAR requirements using the maximum conveyor speed setting tested to and certified to NSF/ANSI Standard 3. Water consumption values using the maximum conveyor speed setting shall be used for qualification purposes. Water consumption using the slowest conveyor speed shall also be reported to EPA.
- C. Dual Sanitizing Machines: As defined in Section 1, these machines shall meet both the high temp and low temp requirements presented in Table 1, above, to qualify as ENERGY STAR.
- D. Dual Purpose Door Type Machines: Machines designed to be used either as a standard door type machine or a pot, pan, and utensil machine shall meet the performance requirements for

both of those sub categories.

- E. Post Sanitizing Machines: Machines offering a post sanitizing rinse will be evaluated for ENERGY STAR qualification with the post sanitizing rinse turned on during testing. The final rinse water consumption will include both sanitizing and post sanitizing rinses.
- F. Industry Standard Certifications: All machines shall be certified to the NSF/ANSI 3-2010 Standard, *Commercial Warewashing Equipment*.
- G. 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.
 - c. Directly measured or calculated values that are submitted for reporting on the ENERGY STAR website shall be rounded to the second decimal place.

4) **Test Requirements:**

- 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.
- B. When testing commercial dishwashers, the following test methods shall be used to determine ENERGY STAR qualification:

ENERGY STAR Requirement	Test Method Reference
Idle Energy Rate, GPH, GPR, and GPSF (all machines)	<i>ENERGY STAR Test Method for Commercial Dishwashers (Rev. May-2012)</i>

- 5) **Effective Date:** The ENERGY STAR Commercial Dishwasher Specification shall take effect on **February 1, 2013**. To qualify 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.
- 6) **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 the ENERGY STAR qualification is not automatically granted for the life of a product model.

ASTM Test Standard Review: EPA will revisit this specification once the revision processes for ASTM F1696 and ASTM F1920 are complete to evaluate new performance requirements that capture total machine energy consumption.