



ENERGY STAR® Program Requirements Product Specification for Residential Dishwashers

Eligibility Criteria Final Draft Version 5.0

Following is the **Final Draft Version 5.0** ENERGY STAR Product Specification for Residential Dishwashers. A product shall meet all of the identified criteria if it is to earn the ENERGY STAR.

1) Definitions

- A. Dishwasher: A cabinet-like appliance which with the aid of water and detergent, washes, rinses, and dries (when a drying process is included) dishware, glassware, eating utensils, and most cooking utensils by chemical, mechanical and/or electrical means and discharges to the plumbing drainage system.
- a. Compact Dishwasher: A dishwasher that has a capacity of less than eight place settings plus six serving pieces as specified in ANSI/AHAM DW-1 (as incorporated by reference in 10 CFR § 430.22), using the test load specified in section 2.7 of 10 CFR 430, Subpart B, Appendix C.
- b. Standard Dishwasher: A dishwasher that has a capacity equal to or greater than eight place settings plus six serving pieces as specified in ANSI/AHAM DW-1 (as incorporated by reference in 10 CFR § 430.22), using the test load specified in section 2.7 of 10 CFR § 430, Subpart B, Appendix C.
- c. Portable Dishwasher: A dishwasher which is not permanently connected to the household water and electric supply lines. It can be mounted on wheels and easily moved from one place to another in normal use. This definition includes dishwashers intended to be used on a countertop or table.
- B. Basic Model: All units of a given type of product (or class thereof) manufactured by one manufacturer, having the same primary energy source, and which have essentially identical electrical, physical, and functional (or hydraulic) characteristics that affect energy consumption, energy efficiency, water consumption, or water efficiency.

Note: In response to stakeholder comments, EPA has edited the definitions in this Final Draft specification. The changes are as follows:

- The term "used in a residential setting" was removed from the Dishwasher definition to more closely harmonize with the DOE definition.
- References to specific sections of the CFR have been added to the Compact and Standard Dishwasher definitions to further harmonize with those DOE definitions.
- On March 7, 2011, DOE updated its Basic Model definition (Federal Register Vol. 76, No. 44, page 12429). EPA harmonized its Basic Model definition with the new DOE definition.
- EPA has removed cleaning performance reporting requirements from this specification. Thus, definitions for soil-sensing-dishwasher, non-soil-sensing-dishwasher, and Average Cleaning Index are not required at this time and have been removed from this document.

2) Scope

- A. Included Products: Products that meet the definition of a dishwasher as specified herein and a consumer product as specified in 10 CFR § 430.2 are eligible for ENERGY STAR qualification under this specification.

Note: In order to distinguish the Residential Dishwasher program from the Commercial Dishwasher program, EPA has included a reference to the DOE definition of Consumer Product, which is specified in 10 CFR § 430.2.

- B. Excluded Products: Product types not specifically identified in Section 2.A are not eligible for ENERGY STAR qualification under this specification. Products that are covered under other ENERGY STAR product specifications (e.g., Commercial Dishwashers) are not eligible for qualification under this specification.

3) Qualification Criteria

- A. Energy and Water Performance:

Table 1: Energy and Water Performance Requirements

Product Type	Tier 1		Tier 2	
	Water (gallons per cycle)	Energy (kWh per year)	Water (gallons per cycle)	Energy (kWh per year)
Standard	≤ 4.25	≤ 295	TBD	TBD
Compact	≤ 3.50	≤ 222	TBD	TBD
Note: A portable dishwasher may qualify as a standard or compact dishwasher, depending on its capacity.				

Note: No changes have been made to the proposed Tier 1 Version 5.0 energy and water performance requirements in this Final Draft. In the last round of stakeholder comments, a number of stakeholders have again voiced their disagreement with EPA's decision to strengthen the scheduled July 1, 2011 level. EPA reiterates that although new criteria for standard and compact dishwashers had been established in 2008, to become effective July 1, 2011, EPA continues to believe that persistent concerns over high market share necessitate a change in the ENERGY STAR criteria. In its November 14, 2008 letter to stakeholders, the ENERGY STAR program reserved the right to revisit the July 1, 2011 criteria if anticipated qualifying rates warranted more stringent requirements. Anticipated ENERGY STAR dishwasher qualifying rates in 2011 (based on the 2009 market share data and the likelihood of even higher market share in 2010 driven by the availability of rebates) combined with the likelihood of more stringent Federal standards for dishwashers, strongly suggest that the scheduled 2011 requirements for standard dishwashers will not be sufficient to ensure ENERGY STAR effectively differentiates the top performing available models for consumers.

In this Final Draft, EPA has removed the Tier 2 Version 5.0 energy and water performance requirements proposed in Draft 2 document. Instead, EPA has included a placeholder for a future Tier 2 level, to be effective July 1, 2013. EPA will conduct a separate stakeholder process to establish this Tier 2 level.

B. Cleaning Performance (Tier 2 Only): TBD

Note: Following discussions with stakeholders and the February 22, 2011 webinar, EPA has removed the proposed Tier 1 cleaning performance reporting requirement from the Tier 1, Version 5.0 specification. EPA plans to incorporate cleaning performance requirements in the next revision of the specification. As indicated above, Tier 2 requirements will be established through a subsequent stakeholder process. EPA also notes that many stakeholders have expressed support for the inclusion of cleaning performance requirements as more stringent efficiency levels are put in place.

As noted in previous drafts of this specification, EPA will evaluate the latest versions of AHAM DW-1 and IEC 60436 test methods (both of which are currently under revision) for use as an ENERGY STAR cleaning performance test procedure during the next specification revision process. The Association of Home Appliance Manufacturers (AHAM) has indicated its intent to align DW-1 more closely with IEC 60436. EPA supports this initiative to harmonize with international test standards and plans to give primary consideration to the AHAM test procedure. In this Final Draft, EPA has suggested a future Tier 2 effective date of July 1, 2013 to help accommodate AHAM's concerns about the availability of a suitable US test procedure by January 1, 2013. Over the course of the next year, EPA will invite both the AHAM-DW-1 and IEC 60436 Working Groups to participate in EPA-organized webinars to discuss the status of the test procedure revisions and associated round-robin testing with all ENERGY STAR stakeholders.

C. 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 nearest significant digit as expressed in the corresponding specification limit.

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

4) Test Requirements

- A. Units shall be selected for testing per the sampling requirements defined in 10 CFR § 429.19, which references 10 CFR § 429.11.

Note: EPA has updated the sampling requirements in Section 4.A to reference the updated DOE sampling requirements released in the March 7, 2011 Federal Register Vol. 76, No. 44, page 12464.

- B. When testing residential dishwashers, the test methods specified in Table 2 shall be used to determine ENERGY STAR qualification:

Table 2: Test Methods for ENERGY STAR Qualification

ENERGY STAR Requirement	Test Method Reference
Energy Consumption (kWh/year)	10 CFR § 430, Subpart B, Appendix C
Water Consumption (gallons/cycle)	

5) Effective Date

The ENERGY STAR Residential Dishwasher specification shall take effect on the dates specified in Table 3. To qualify for ENERGY STAR, a product model shall meet the ENERGY STAR specification in effect on the date of manufacture. The date of manufacture is specific to each unit and is the date (e.g., month and year) on which a unit is considered to be completely assembled.

Table 3: Specification Effective Dates

Tier 1 Effective Date	Tier 2 Effective Date
January 3, 2012	July 1, 2013

Note: EPA plans to finalize the Version 5.0 Residential Dishwasher specification in April 2011. The Version 5.0 specification will take effect on January 3, 2012.

EPA plans to complete development of the next specification revision prior to a planned July 1, 2013 effective date. EPA reserves the right to revisit this future effective date, if warranted by market conditions or changes to the minimum federal standard.

6) Future Specification Revisions

- A. 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.
- B. EPA intends to investigate the following topics during the next revision of the Residential Dishwashers specification:
 - a. Cleaning Performance – EPA will incorporate a cleaning performance requirement as part of the next ENERGY STAR specification revision.
 - b. “Smart” Requirements – EPA will evaluate the addition of ENERGY STAR requirements to address intelligent product capabilities and smart grid functionality. Initially, EPA anticipates addressing smart grid functionality for product categories that show the greatest potential to provide value to consumers and the grid through new services and features enabled by bi-directional communications.

Data suggest that the majority of dishwasher cycles occur during off-peak periods. This limits the effectiveness of dishwashers as a means to manage peak power. Further, very few consumers are currently under time of use or variable pricing schemes and dishwashers already incorporate functions that could push demand away from peak times (should consumers have some financial incentive to do so), such as cycle delay. For these reasons, EPA has not addressed smart grid functionality in the Version 5 Dishwasher specification.

EPA will explore incentives for smart grid functionality in a future specification revision if consumer savings can be justified. EPA encourages Partners to share any information that will inform the development of ENERGY STAR dishwasher smart grid requirements, such as specific near term consumer benefits, and how these benefits can be measured and verified. EPA is also interested in understanding price differentials for products with smart grid functionality.