



ENERGY STAR® Program Requirements Product Specification for Residential Dishwashers

Eligibility Criteria Final Draft Version 5.0

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

3 **1) Definitions**

4 A. Dishwasher: A cabinet-like appliance which with the aid of water and detergent, washes, rinses, and
5 dries (when a drying process is included) dishware, glassware, eating utensils, and most cooking
6 utensils by chemical, mechanical and/or electrical means and discharges to the plumbing drainage
7 system.

8 a. Compact Dishwasher: A dishwasher that has a capacity of less than eight place settings plus six
9 serving pieces as specified in ANSI/AHAM DW-1 (as incorporated by reference in 10 CFR §
10 430.22), using the test load specified in section 2.7 of 10 CFR 430, Subpart B, Appendix C.

11 b. Standard Dishwasher: A dishwasher that has a capacity equal to or greater than eight place
12 settings plus six serving pieces as specified in ANSI/AHAM DW-1 (as incorporated by reference
13 in 10 CFR § 430.22), using the test load specified in section 2.7 of 10 CFR § 430, Subpart B,
14 Appendix C.

15 c. Portable Dishwasher: A dishwasher which is not permanently connected to the household water
16 and electric supply lines. It can be mounted on wheels and easily moved from one place to
17 another in normal use. This definition includes dishwashers intended to be used on a countertop
18 or table.

19 B. Basic Model: All units of a given type of product (or class thereof) manufactured by one manufacturer,
20 having the same primary energy source, and which have essentially identical electrical, physical, and
21 functional (or hydraulic) characteristics that affect energy consumption, energy efficiency, water
22 consumption, or water efficiency.

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

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

34 **2) Scope**

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

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

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

44 **3) Qualification Criteria**

45 A. Energy and Water Performance:

46 **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.

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

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

62 B. Cleaning Performance (Tier 2 Only): TBD

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

69 As noted in previous drafts of this specification, EPA will evaluate the latest versions of AHAM DW-1 and IEC
70 60436 test methods (both of which are currently under revision) for use as an ENERGY STAR cleaning
71 performance test procedure during the next specification revision process. The Association of Home Appliance
72 Manufacturers (AHAM) has indicated its intent to align DW-1 more closely with IEC 60436. EPA supports this
73 initiative to harmonize with international test standards and plans to give primary consideration to the AHAM test
74 procedure. In this Final Draft, EPA has suggested a future Tier 2 effective date of July 1, 2013 to help
75 accommodate AHAM's concerns about the availability of a suitable US test procedure by January 1, 2013. Over
76 the course of the next year, EPA will invite both the AHAM-DW-1 and IEC 60436 Working Groups to participate in
77 EPA-organized webinars to discuss the status of the test procedure revisions and associated round-robin testing
78 with all ENERGY STAR stakeholders.

79 C. Significant Digits and Rounding:

- 80 a. All calculations shall be carried out with directly measured (unrounded) values.
81 b. Unless otherwise specified, compliance with specification limits shall be evaluated using directly
82 measured or calculated values without any benefit from rounding.
83 c. Directly measured or calculated values that are submitted for reporting on the ENERGY STAR
84 website shall be rounded to the nearest significant digit as expressed in the corresponding
85 specification limit.

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

88 **4) Test Requirements**

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

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

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

95 **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)	

97 **5) Effective Date**

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

102 **Table 3: Specification Effective Dates**

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

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

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

108 **6) Future Specification Revisions**

- 109 A. EPA reserves the right to change the specification should technological and/or market changes affect its
110 usefulness to consumers, industry, or the environment. In keeping with current policy, revisions to the
111 specification are arrived at through industry discussions. In the event of a specification revision, please
112 note that the ENERGY STAR qualification is not automatically granted for the life of a product model.
- 113 B. EPA intends to investigate the following topics during the next revision of the Residential Dishwashers
114 specification:
- 115 a. Cleaning Performance – EPA will incorporate a cleaning performance requirement as part of the
116 next ENERGY STAR specification revision.
 - 117 b. “Smart” Requirements – EPA will evaluate the addition of ENERGY STAR requirements to address
118 intelligent product capabilities and smart grid functionality. Initially, EPA anticipates addressing
119 smart grid functionality for product categories that show the greatest potential to provide value to
120 consumers and the grid through new services and features enabled by bi-directional
121 communications.

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

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