



ENERGY STAR[®] Program Requirements Product Specification for Clothes Washers

Eligibility Criteria Final Draft Version 6.0

Following is the **Final Draft Version 6.0** product specification for ENERGY STAR qualified clothes washers. A product shall meet all of the identified criteria if it is to earn the ENERGY STAR.

Note: This Final Draft Version 6.0 document contains revisions for commercial clothes washers.

Through a separate stakeholder process, EPA is also proposing new requirements for combination all-in-one washer-dryers (combination W/Ds). For clarity, the latest set of changes being proposed for commercial washers are shown in red font below, while the changes proposed in the Draft 1 for combination W/Ds issued October 12, 2011, are shown in blue font. EPA will combine changes from both revision processes into a final Version 6.0 specification document at the close of these two specification development efforts.

Please send comments via email to appliances@energystar.gov no later than November 28, 2011.

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

- A. **Residential Clothes Washer:** A consumer product designed to clean clothes, utilizing a water solution of soap and/or detergent and mechanical agitation or other movement, and must be one of the following classes: automatic clothes washers, semi-automatic clothes washers, and other clothes washers.
- B. **Commercial Clothes Washer:** A soft-mounted front-loading or soft-mounted top-loading clothes washer that is defined for use in:
 - (i) Applications in which the occupants of more than one household will be using the clothes washer, such as multi-family housing common areas and coin laundries; or
 - (ii) Other commercial applications.
- C. **Combination All-in-One Washer-Dryer:** A consumer product designed to clean and dry fabrics in a single drum, where drying is accomplished through use of electricity or gas as a heat source and forced air circulation.
- D. **Combined Energy Factor:** Combined Energy Factor ("CEF") is the energy efficiency measure for clothes dryers. It is calculated as the clothes dryer test load weight in pounds divided by the sum of "active mode" per-cycle energy use and "inactive mode" per-cycle energy use in kWh.
- E. **Modified Energy Factor:** Modified Energy Factor ("MEF") is the present energy efficiency measure for all clothes washers. MEF is the quotient of the cubic foot (or liter) capacity of the clothes container divided by the total clothes washer energy consumption per cycle, with such energy consumption expressed as the sum of the machine electrical energy consumption, the hot water energy consumption, and the energy required for removal of the remaining moisture in the wash load. The units are cubic feet per kilowatt-hours (kWh) per cycle (ft³/kWh/cycle) (or liters per kilowatt-hour per cycle). The higher the value, the more efficient the clothes washer.
- F. **Basic Model:** Units of a given type of covered 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.
- G. **Water Factor:** Water factor ("WF") is the present water efficiency calculation that allows the comparison of clothes washer water consumption independent of clothes washer capacity. The term is expressed as gallons per cycle per cubic feet (or liter per cycle per liter). WF is the quotient of the total weighted per-

cycle water consumption divided by the cubic foot (or liter) capacity of the clothes washer. The lower the value, the more efficient the clothes washer.

Note: EPA thanks stakeholders for comments provided on the Draft 1 commercial clothes washer definition. In the Draft Final Version 6.0, EPA is proposing to incorporate the DOE Commercial Clothes Washer definition proposed in Draft 1, with the exception of the maximum capacity requirements. A number of stakeholders have recommended Agency harmonize with this DOE definition, however, other stakeholders expressed concern with this proposal, noting there was no reason to exclude larger washers, including several currently qualified models, from the program. EPA notes that the current DOE clothes washer test procedure allows larger capacity clothes washers (up to 3.8 cubic feet), to be tested, and further changes to the test procedure have been proposed by DOE that would permit testing washers as large as 6.0 cubic feet.¹ Since larger commercial washers can provide both high efficiency and the opportunity for end-users to run larger and thus fewer loads, EPA does not feel it is appropriate to exclude larger products from the program. EPA notes that the guidance DOE has provided on the clothes washer test procedure applies to the testing of both residential *and* commercial clothes washers for the purpose of ENERGY STAR qualification, since the both residential and commercial washers are tested using the same DOE test procedure(10 CFR 430, Subpart B, Appendix J1).

Per stakeholder comment, EPA has also updated the definition for Modified Energy Factor (MEF) and Water Factor (WF) to fully harmonize with the DOE definition.

2) **Scope:**

- A. **Included Products:** Products that meet the definition of a residential clothes washer, commercial clothes washer, and/or combination all-in-one washer-dryer as specified herein are eligible for ENERGY STAR qualification, with the exception of products listed in Section 2.B.
- B. **Excluded Products:** Clothes washers with a capacity of less than 1.6 ft³ and/or are configured in any way other than a front- or top-loading design are not eligible for ENERGY STAR. Also, all-in-one washer dryers” are not eligible for ENERGY STAR.

2) **Qualification Criteria:**

- A. MEF, WF, and CEF Requirements:

Table 1: ENERGY STAR Criteria for Clothes Washers

Residential Clothes Washers	MEF \geq 2.0 WF \leq 6.0
Commercial Clothes Washers	MEF \geq 2.2 WF \leq 4.5
Combination All-in-One Washer-Dryers	MEF \geq 2.0 WF \leq 6.0 CEF \geq 2.5

¹ Federal Register Vol. 76, No. 153, page 49250 <http://www.gpo.gov/fdsys/pkg/FR-2011-08-09/pdf/2011-19440.pdf>
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Note: EPA has retained the new levels for commercial clothes washers proposed in Draft 1. There are a variety of models offered by a number of different manufacturers that meet the proposed criteria and provide end-users with a payback in a reasonable amount of time. A number of different stakeholders have supported these proposed levels. EPA notes that some stakeholders also expressed concern around performance. Most believed that further strengthening of MEF and WF criteria beyond the Version 6.0 levels may negatively impact product performance and therefore recommended that if the specification for commercial washers was further revised at some point in the future, the Agency should consider whether to sunset the program or include cleaning and rinse performance criteria. EPA appreciates this feedback and plans to engage with stakeholders to consider both options when the specification is next reviewed for possible revision.

B. Water Consumption Reporting Requirement (For Combination All-in-One Washer-Dryers Only):

Water consumption during the dryer test shall be measured and the average water consumption (in gallons per cycle) across units tested shall be reported.

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.

Note: In Draft 1, EPA proposed clarifications to the language in Sections C and D, consistent with other appliance specification revisions. Stakeholders agreed with proposed amendments and no further changes are being proposed in this Final Draft Version 6.0 specification.

3) Test Requirements:

A. One of the following sampling plans shall be used to test for qualification to ENERGY STAR:

- a. A representative unit shall be selected for testing based on the definition for Basic Model provided in Section 1. above; or
- b. Units shall be selected for testing per the sampling requirements as defined in Table 2:

**Table 2: ENERGY STAR
Sampling Requirements for Clothes Washers**

Residential Clothes Washers	10 CFR § 429.20, which references 10 CFR § 429.11
Commercial Clothes Washers	10 CFR § 429.46, which references 10 CFR § 429.11
Combination All-in-One Washer-Dryers	For MEF and WF rating: 10 CFR § 429.20, which references 10 CFR § 429.11 For CEF rating 10 CFR § 429.21, which references 10 CFR § 429.11

Note: In Draft 1, EPA proposed clarifications to the language in Section 3A, consistent with other appliance specification revisions. Stakeholders agreed with proposed amendments and no further changes are being proposed in this Final Draft Version 6.0 specification.

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

Table 3: Test Methods for ENERGY STAR Qualification

Efficiency Requirement/ Reporting Requirement	Test Method Reference
MEF	10 CFR 430, Subpart B, Appendix J1 ¹
WF	
CEF	10 CFR § 430, Subpart B, Appendix D1 ¹
Water Consumption Reporting	<p>Additional Test Parameters for Water Consumption Reporting:</p> <ul style="list-style-type: none"> a. A water meter shall be installed in both the hot and cold water lines to measure total water consumption. The water meter shall have a resolution no larger than 0.1 gallons (0.4 liters) and a maximum error no greater than 2 percent for the water flow rates being measured. b. A water pressure gauge shall be installed in both the hot and cold water lines to measure water pressure. The water pressure gauge shall have a resolution of 1 pound per square inch gauge (psig) (6.9 kPa) and shall have an error no greater than 5 percent of any measured value. c. The water temperature shall be 135°F +/- 5 °F and 60 °F +/- 5 °F for cold water. The static water pressure for a single water inlet connection shall be maintained at 35 psig +/- 2 psig. d. The average water consumption across the units tested shall be reported.

¹ *And in accordance with any applicable DOE issued test procedure guidance, listed here: <http://www1.eere.energy.gov/guidance/default.aspx?pid=2&spid=1>*

Note: In this Final Draft, with input from DOE, EPA is proposing to clarify that testing be carried out using the DOE test procedure and in accordance with any applicable DOE issued test procedure guidance, which is posted to DOE website. Any clarifications issued by DOE with respect to test of residential clothes washers, are also applicable for testing clothes washers for the purposes of ENERGY STAR qualification, since both commercial and residential clothes washers are tested using the same DOE test procedure (10 CFR 430, Subpart B, Appendix J1).

EPA and DOE welcome any feedback on this proposed clarification.

- 5) **Effective Date:** The ENERGY STAR Clothes Washer specification shall take effect on **January 8, 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 (e.g., month and year) on which a unit is considered to be completely assembled.
- 6) **Future Criteria Revisions:** ENERGY STAR 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.