



# ENERGY STAR® Program Requirements Product Specification for Combined Laundry Products

## Eligibility Criteria Draft 1 Version 1.0

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8 Following is the **Draft 1 Version 1.0** product specification for ENERGY STAR certified combined laundry products. A  
9 product shall meet all the identified required criteria if it is to earn the ENERGY STAR.

### 10 11 1) Definitions:

12 Below are the definitions of the relevant terms in this document. Where noted below, definitions are identical to the  
13 definitions in the U.S. Department of Energy (DOE) test procedure at Title 10 Code of Federal Regulations (CFR) 430,  
14 Subpart B, Appendix J2 and D2, or in 10 CFR 430.2 and 10 CFR 431.152. When in conflict, the definitions in the CFR  
15 take precedence.

- 16  
17 A. Residential Clothes Washer<sup>1</sup>: A consumer product designed to clean clothes, utilizing a water solution of soap  
18 and/or detergent and mechanical agitation or other movement, and must be one of the following classes: automatic  
19 clothes washers, semi-automatic clothes washers, and other clothes washers.
- 20 B. Combination All-in-One Washer-Dryer: A consumer product that meets the definition of a Residential Clothes  
21 Washer and Electric Clothes Dryer or Gas Clothes Dryer, which cleans and dries clothes in a single tumble-type  
22 drum; a drying cycle can be performed independently without first performing a wash cycle.
- 23 1. Combination All-in-One Washer-Dryer with Air-Only Drying: A Combination All-in-One Washer-Dryer that uses  
24 circulated air (without the use of water) to cool and condense moisture from the dryer process air, during the dry  
25 cycle.
- 26 2. Combination All-in-One Washer-Dryer with Water-Cooled Drying: A Combination All-in-One Washer-Dryer that  
27 consumes water to cool and condense moisture from the dryer process air, during the dry cycle.
- 28 C. Laundry Center: A consumer product that meets the definition of a Residential Clothes Washer and Electric Clothes  
29 Dryer or Gas Clothes Dryer, which cleans and dries clothes in separate, stacked drums.
- 30 D. Integrated Modified Energy Factor (IMEF)<sup>2</sup>: The quotient of the cubic foot (or liter) capacity of the clothes container  
31 divided by the total clothes washer energy consumption per cycle, with such energy consumption expressed as the  
32 sum of the machine electrical energy consumption, the hot water energy consumption, the energy required for  
33 removal of the remaining moisture in the wash load, and the combined low-power mode energy consumption.
- 34 E. Integrated Water Factor (IWF)<sup>2</sup>: The quotient of the total weighted per-cycle water consumption for all wash cycles  
35 in gallons divided by the cubic foot (or liter) capacity of the clothes washer.
- 36 F. Electric Clothes Dryer<sup>1</sup>: A cabinet-like appliance designed to dry fabrics in a tumble-type drum with forced air  
37 circulation. The heat source is electricity and the drum and blower(s) are driven by an electric motor(s).
- 38 G. Gas Clothes Dryer<sup>1</sup>: A cabinet-like appliance designed to dry fabrics in a tumble-type drum with forced air circulation.  
39 The heat source is gas and the drum and blower(s) are driven by an electric motor(s).
- 40 H. Compact size Clothes Dryer<sup>3</sup>: A clothes dryer with a drum capacity of less than 4.4 cubic feet.
- 41 I. Standard size Clothes Dryer<sup>3</sup>: A clothes dryer with a drum capacity of 4.4 cubic feet or greater.

<sup>1</sup> 10 CFR 430 Subpart A, Section 430.2

<sup>2</sup> 10 CFR 430, Subpart B, Appendix J2

<sup>3</sup> 10 CFR 430 Subpart B, Appendix D2

- 42 J. Vented Clothes Dryer<sup>4</sup>: A clothes dryer that exhausts the evaporated moisture from the cabinet.
- 43 K. Ventless Clothes Dryer<sup>4</sup>: A clothes dryer that uses a closed-loop system with an internal condenser to remove the  
44 evaporated moisture from the heated air. Moist air is not discharged from the cabinet.
- 45 L. Combined Energy Factor (CEF)<sup>4</sup>: The clothes dryer bone dry test load weight in pounds divided by the sum of the per  
46 cycle standby and off mode energy consumption and either the total per-cycle electric dryer energy consumption or  
47 the total per-cycle gas dryer energy consumption expressed in kilowatt hours (kWh).
- 48 M. Basic Model<sup>5</sup>: All units of a given type of covered product (or class thereof) manufactured by one manufacturer,  
49 having the same primary energy source, and which have essentially identical electrical, physical, and functional (or  
50 hydraulic) characteristics that affect energy consumption, energy efficiency, water consumption, or water efficiency.

51 **Note:** The EPA aligned the definitions and references with the DOE.

52 **2) Scope:**

- 53 A. Included Products: Products that meet the definition of a Combination All-in-One Washer-Dryer or Laundry Center  
54 as specified herein are eligible for ENERGY STAR certification, with the exception of products listed in Section 2)B.
- 55 B. Excluded Products: Products that are covered under other ENERGY STAR product specifications are not eligible for  
56 certification under this specification.

57 **Note:** Residential clothes dryers, residential clothes washers, and commercial clothes washers are currently covered  
58 under other specifications. The EPA is interested in stakeholder feedback on the scope of this specification and if further  
59 clarification is necessary to differentiate eligible and ineligible products.

60 **3) Certification Criteria:**

- 61 A. Integrated Modified Energy Factor (IMEF) and Integrated Water Factor (IWF): The IMEF shall be greater than or  
62 equal to the Minimum IMEF and the IWF shall be less than or equal to the Maximum IWF, as displayed in Table 1.

**Table 1: Residential Clothes Washer IMEF and IWF Levels**

Product Type*	Minimum IMEF (cubic feet/kWh/cycle)	Maximum IWF (gallons/cycle/cu-ft)
Residential Clothes Washers, Front-loading ( > 2.5 cu-ft)	2.92	3.0
Residential Clothes Washers, Top-loading ( > 2.5 cu-ft)	2.20	3.7
Residential Clothes Washers ( ≤ 2.5 cu-ft)	2.20	3.7

\* Those products meeting the definition of a Combination All-in-One Washer-Dryer or Laundry Center must meet the appropriate IMEF, CEF and IWF, as outlined in Table 1 and Table 2.

<sup>4</sup> 10 CFR 430 Subpart B, Appendix D2

<sup>5</sup> 10 CFR 430 Subpart A, Section 430.2

63 B. Combined Energy Factor (CEF): CEF shall be greater than or equal to the Minimum CEF as displayed in **Table 2**.

64 **Table 2: Residential Clothes Dryer CEF Levels**

Product Type*	Minimum CEF (lbs/kWh)
Vented Gas	3.65
Ventless or Vented Standard, Electric (4.4 cu-ft or greater capacity)	5.20
Ventless Compact, Electric 120V (less than 4.4 cu-ft capacity)	6.30
Ventless or Vented Compact, Electric 240V (less than 4.4 cu-ft capacity)	5.50

\* Those products meeting the definition of a Residential Combination All-in-One Washer-Dryer or Laundry Center must meet the appropriate IMEF, CEF and IWF, as outlined in Table 1 and Table 2.

65 **Note:** Momentum has rapidly built around the expansion of combined laundry products, with energy efficiency program  
66 sponsors, manufacturers, and retailers eager for these products to grow their market presence. With this in mind, the EPA  
67 seeks to establish an ENERGY STAR specification that recognizes combination laundry product models that deliver  
68 energy efficiency without compromising performance. The EPA is proposing an energy consumption requirement and  
69 water consumption requirement with this Draft 1 ENERGY STAR combined laundry products specification.

70 The EPA is proposing the same IMEF, IWF, and CEF levels for combined laundry products in this Draft 1 specification as  
71 proposed in the Draft 1 Version 9.0 clothes washer specification and the Draft 1 Version 2.0 dryer specification.

72 C. Drying Cycle Time: The elapsed time for the product to complete the drying test cycle must be 80 minutes or less.  
73 Combination all-in-one washer-dryers are exempt from the 80-minute maximum drying cycle time requirement.

74 **Note:** The cycle setting(s) tested under Appendix D2 should be designed to deliver satisfactory user experience, such  
75 that settings providing equivalent or reduced energy use are encouraged across most loads and anticipated consumer  
76 savings and environmental benefits are realized.

77  
78 D. User Information Requirements: Product shall be shipped with informational materials to notify consumers of the  
79 following:

- 80 1. The specific cycle and setting selections (cycle type, heat setting, default settings engaged, etc.) that the energy  
81 use rating of the dryer component of this combined laundry product is based upon.
- 82 2. Guidance about cycles and settings that may use more or less energy than this one, for example: "Longer, low  
83 heat drying cycles tend to use less energy, as do less dry settings."

84 E. Model Numbers: Report the model numbers used for ENERGY STAR certified product submissions which shall be  
85 consistent with DOE (as specified in 10 CFR 429.20(b) and 10 CFR 429.21(b)) submissions.

86 F. Additional Reporting Requirements:

- 87 1. Report whether the combination laundry product conforms to CTA-2045 or (when connected to a network) to  
88 OpenADR, or to a similar protocol for grid service requests.

89 **Note:** Because the DR Protocol is not necessarily available along with other product information, the EPA is calling this  
90 out as a separate reporting requirement since it is valuable information for utilities.

91 **4) Test Requirements:**

- 92 A. One of the following sampling plans shall be used to test for certification to ENERGY STAR:
- 93 1. A single unit is selected, obtained, and tested. The measured performance of this unit and of each subsequent unit
- 94 manufactured must be equal to or better than the ENERGY STAR specification requirements. Note that to
- 95 determine the represented value per 10 CFR 429.20 and 10 CFR 429.21, additional testing outside of ENERGY
- 96 STAR is required. The represented value must also be equal to or better than the ENERGY STAR specification
- 97 requirements; or
- 98 2. At least two units are selected, obtained and tested. The represented value is calculated from the test results
- 99 according to the sampling requirements defined in 10 CFR 429.20 and 10 CFR 429.21. The represented value
- 100 must be equal to or better than the ENERGY STAR specification requirements.

101

102 Results of the tested unit(s) may be used to certify additional individual model variations within a Basic Model as long as

103 the definition for Basic Model provided in Section 1, above, and in 10 CFR 430.2 is met.

104

- 105 B. When testing the energy and water efficiency of clothes washer dryers, the following test method shall be used to
- 106 determine ENERGY STAR certification:

107 **Table 3: Test Methods for ENERGY STAR Certification**

Efficiency Requirement	Test Method Reference
IMEF and IWF	10 CFR 430, Subpart B, Appendix J2* OR DOE-approved test procedure waiver pursuant to 10 CFR 430.27
CEF	10 CFR 430, Subpart B, Appendix D2* OR DOE-approved test procedure waiver pursuant to 10 CFR 430.27

\* 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>

- 108
- 109 C. The length of the drying cycle shall be determined, as required by Section 3.D, by measuring the test cycle time, *t*, for
- 110 the drying test cycle specified in sections 3.3.1 and 3.3.2 of Appendix D2 for timer dryers and automatic termination
- 111 control dryers, respectively, using a timer accurate to within 2 seconds.
- 112 1. For timer dryers, the correction shown in Equation 1 shall be applied to determine the drying cycle time:

113 **Equation 1: Calculation of Drying Cycle Time**

$$T_{dry} = [55.5 / (W_w - W_d)] * t$$

114 Where:

- 115 •  $W_w$  is the moisture content of the wet test load as recorded in section 3.4.2 of 10 CFR 430, subpart B,
- 116 appendix D2.
- 117 •  $W_d$  is the moisture content of the dry test load as recorded in section 3.4.3 of 10 CFR 430, subpart B,
- 118 appendix D2.
- 119 •  $t$  is the measured cycle test time.

- 120
- 121 2. For automatic termination dryers, the drying cycle time equals the test cycle time.
- 122 3. When the cycle tested under Appendix D2, typically the normal cycle, is selected, the dryer shall not default to an
- 123 eco mode or setting, which is a setting that indicates to the consumer it would make the cycle more energy-
- 124 efficient.

- 125 D. Significant Digits and Rounding: All calculations shall be carried out as specified in Subpart B of Part 430 Appendix  
126 J2 and D2, as applicable; and 10 CFR Part 430.23(d)(3) and 10 CFR Part 430.23(j). Do not round individual test  
127 results. Rounding is specified in 10 CFR Part 429 for the represented value.

128 **Note:** For this specification, the EPA is referencing the DOE test procedure for residential clothes washers and residential  
129 clothes dryers. The EPA includes the same sampling plans used for other ENERGY STAR appliances.

130 **5) Effective Date:**

- 131 A. The ENERGY STAR Combined Laundry Products specification shall take effect on TBD. Any product model with a  
132 date of manufacture on or after this date shall meet this specification to earn the ENERGY STAR. The date of  
133 manufacture is specific to each unit and is the date on which a unit is considered to be completely assembled.

134 **Note:** The EPA intends to finalize this Version 1.0 specification in 2025 and anticipates it would take effect 9 months later  
135 at the same time as the Clothes Washers Version 9 and Clothes Dryers Version 2 specifications. Once this specification  
136 is finalized, brand owners will be free to certify products to it immediately. Products that are currently certified will remain  
137 on the list of certified products until the effective date of the specification.

138 **6) Future Specification Revisions:**

- 139 A. The EPA reserves the right to change the specification should federal requirements, technological and/or market  
140 changes affect its usefulness to consumers, industry or the environment. In keeping with current policy, revisions to  
141 the specification are arrived at through industry discussions. In the event of a specification revision, please note that  
142 ENERGY STAR certification is not automatically granted for the life of a product model.