



ENERGY STAR® Program Requirements Product Specification for Dehumidifiers

Eligibility Criteria Draft 1 Version 6.0

Following is the Draft 1 Version 6.0 product specification for ENERGY STAR certified dehumidifiers. A product shall meet all of the identified criteria if it is to earn the ENERGY STAR.

- 1) **Definitions:** Below are the definitions of the relevant terms in this document. Where noted below, definitions are identical to the definitions in the U.S Department of Energy (DOE) test procedure at 10 Code of Federal Regulations (CFR) 430, Subpart B, Appendix X1 or in 10 CFR 430.2. The definitions from the CFR have been reprinted for ease of use; however, the CFR definitions take precedence and may be modified by DOE.
 - A. **Dehumidifier¹:** A product, other than a portable air conditioner, room air conditioner, or packaged terminal air conditioner, that is a self-contained, electrically operated, and mechanically encased assembly consisting of: (a) a refrigerated surface (evaporator) that condenses moisture from the atmosphere; (b) a refrigerating system, including an electric motor; (c) an air-circulating fan; and (d) means for collecting or disposing of the condensate.
 - a. **Portable Dehumidifier:** A dehumidifier that, in accordance with any manufacturer instructions available to a consumer, operates within the dehumidified space without the attachment of additional ducting, although means may be provided for optional duct attachment.
 - b. **Whole-home Dehumidifier:** A dehumidifier that, in accordance with any manufacturer instructions available to a consumer, operates with ducting to deliver return process air to its inlet and to supply dehumidified process air from its outlet to one or more locations in the dehumidified space.
 - B. **Capacity²:** A measure of the ability of a dehumidifier to remove moisture from its surrounding atmosphere, measured in pints collected per 24 hours of operation under the specified ambient conditions, as determined in accordance with the test standard referenced in Section 4, below.
 - C. **Product Case Volume³:** For whole-home dehumidifiers, this is a measure of the rectangular volume that the product case occupies, exclusive of any duct attachment collars or other external components.
 - D. **Integrated Energy Factor (IEF)⁴:** A measure of the efficiency of the unit expressed in liters per kilowatt-hour, representing the ratio between the capacity and the total energy consumed by the unit in dehumidification mode and standby and/or off mode(s), adjusted for the representative number of hours per year spent in each mode.

¹ 10 CFR 430.2

² 10 CFR 430.23(z)(1), Appendix X1 to Subpart B of 10 CFR Part 430, Section 5.2

³ Appendix X1 to Subpart B of 10 CFR Part 430, Section 2

⁴ 10 CFR 430.23(z)(2), Appendix X1 to Subpart B of 10 CFR Part 430, Section 5.4

Note: EPA proposes to update the definitions and references to align with the DOE.

- E. Basic Model⁵: 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.

2) Scope:

- A. Included Products: Products that meet the definition of a dehumidifier as specified herein are eligible for ENERGY STAR certification, with the exception of products listed in Section 2B.
- B. Excluded Products: Dehumidifiers with product capacities greater than 155 U.S. pints/day (73.34 liters/day) are not eligible for ENERGY STAR.

3) Certification Criteria:

- A. Energy Efficiency Requirements: To certify for ENERGY STAR, dehumidifiers shall meet the IEF requirements provided in Table 1 and Table 2, below.

Table 1: Performance Criteria for ENERGY STAR Certified Portable Dehumidifiers

Product Capacity (Pints/Day)	Integrated Energy Factor Under Test Conditions (L/kWh)
≤ 25.00	≥ 1.70
25.01 to 50.00	≥ 2.01
≥ 50.01	≥ 3.30

Table 2: Performance Criteria for ENERGY STAR Certified Whole-home Dehumidifiers

Product Case Volume (ft ³)	Integrated Energy Factor Under Test Conditions (L/kWh)
≤ 8.0	≥ 2.22
> 8.0	≥ 3.81

Note: In February 2019, EPA finalized a Version 5.0 specification, which set the ENERGY STAR level at, depending on product class, 13-37% more efficient than the 2019 DOE standard. For Draft 1 of Version 6.0, EPA is proposing ENERGY STAR Dehumidifiers must be, depending on product class, 18-58% more efficient than the 2019 DOE standard.

There is currently a good selection of available models in the most popular product classes from a range of manufacturers that would meet the proposed levels. The percentages of qualifying models currently on the market are 18% for portable dehumidifiers and 35% for whole home dehumidifiers models.

The ENERGY STAR market share for dehumidifiers is currently about 90%. Following past major revisions of the specification, the market penetration of ENERGY STAR dehumidifiers dipped to around 60% of the market and then rapidly rising within a couple years of revising the specification. EPA anticipates at the proposed levels, the ENERGY STAR market share may decrease to around 25%, but then rise again. The average payback for the portable dehumidifiers product classes is below 1 year and 5.9 years for the smaller product class of whole-home dehumidifiers.

⁵ 10 CFR 430.2

EPA welcomes comments on the proposed levels.

Note: Dehumidifiers with the ability to operate as both a portable and whole-home dehumidifier, by means of installation or removal of an optional ducting kit, shall meet requirements under both configurations to be certified.

B. Other Requirements:

Certified units shall be equipped with an adjustable humidistat control or shall require a remote humidistat control to operate.

4) Test Requirements:

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

- a. A single unit is selected, obtained, and tested. The measured performance of this unit and of each subsequent unit manufactured must be equal to or better than the ENERGY STAR specification requirements. Note that to determine the represented value per 10 CFR 429.36, additional testing outside of ENERGY STAR is required. The represented value must also be equal to or better than the ENERGY STAR specification requirements; or
- b. At least two units are selected, obtained and tested. The represented value is calculated from the test results according to the sampling requirements defined in 10 CFR 429.36. The represented value must be equal to or better than the ENERGY STAR specification requirements.

Results of the tested unit(s) may be used to certify additional individual model variations within a Basic Model as long as the definition for Basic Model provided in Section 1, above, and in 10 CFR 430.2 is met.

B. When testing dehumidifiers, the following test methods shall be used to determine ENERGY STAR certification:

Table 3: Test Methods for ENERGY STAR Certification

ENERGY STAR Requirement	Test Method Reference
Capacity, Product Case Volume, and Integrated Energy Factor (IEF)	10 CFR 430, Subpart B, Appendix X1
	OR DOE-approved test procedure waiver pursuant to 10 CFR 430.27

- C. **Represented Value:** The represented value is the identical value certified to DOE, listed on the ENERGY STAR QPL, and shown on consumer facing materials.
- D. For the purpose of ENERGY STAR certification, the performance of efficient variable speed dehumidifiers shall require a test procedure waiver from DOE per 10 CFR 430.27.
- E. **Significant Digits and Rounding:** All calculations shall be carried out as specified in 10 CFR 430, Subpart B, Appendix X1 and 10 CFR 430.23(z). Do not round individual test results. Rounding is specified in 10 CFR 429.36 for the represented value.

5) Effective Date:

The ENERGY STAR Version 6.0 Dehumidifier Specification shall take effect on TBD. To certify 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 on which a unit is considered to be completely assembled.

Note: EPA intends to finalize this Version 6.0 specification in 2024 and anticipates it would take effect 9 months later. Once this specification is finalized, brand owners will be free to certify products to it immediately. Products that are currently certified will remain on the list of certified products until the effective date of the specification.

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 certification is not automatically granted for the life of a product model.