



ENERGY STAR® Program Requirements Product Specification for Dehumidifiers

Eligibility Criteria Draft 1 Version 4.0

Following is the **Draft 1 Version 4.0** 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.

- A. Dehumidifier: A self-contained, electrically operated, and mechanically refrigerated 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 condensate¹.
- a. Stand Alone: Portable unit designed to provide dehumidification within the confined living space where it is placed and plugged into an electrical outlet.
- b. Whole House: Unit designed to be incorporated into the home's heating and cooling (HVAC) system, or installed with its own duct system, providing dehumidification for all conditioned spaces within the building enclosure.
- 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 continuous operation. Capacity shall be measured according to the test standard referenced in Section 4 below.
- C. Energy Factor (EF)²: A measure of energy efficiency of a dehumidifier calculated by dividing the water removed from the air by the energy consumed, measured in liters per kilowatt hour (L/kWh). EF shall be calculated according to the test standard referenced in Section 4 below.
- D. Basic Model Group¹: 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 qualification, with the exception of products listed in Section 2.B. Stand alone and whole house units with capacities measuring less than or equal to 185 U.S. pints (87.5 liters) per day are eligible for ENERGY STAR.
- B. Excluded Products: Dehumidifiers with daily water-removal capacities greater than 185 U.S. pints (87.5 liters) per day are not eligible for ENERGY STAR.

3) **Qualification Criteria:**

- A. Energy Efficiency Requirements: To qualify for ENERGY STAR, dehumidifiers shall meet the EF requirements provided in Table 1, below.

¹ 10 CFR Subpart A of Part 430

² 10 CFR Appendix X to Subpart B of Part 430

Table 1: Performance Criteria for ENERGY STAR Certified Dehumidifiers

Product Capacity (Pints/Day)	Energy Factor Under Test Conditions (L/kWh)
< 75	≥ 2.00
75 ≤ 185	≥ 2.80

Note: The current ENERGY STAR requirements for dehumidifiers have been in effect since October 1, 2012 (Version 3.0). EPA is revising the specification due to: 1) high ENERGY STAR market penetration, 89% in 2014; and 2) availability of higher efficiency products in the market. In order to continue to distinguish the most energy efficient products that provide significant energy and cost savings to the consumer while providing excellent performance, EPA proposes the following changes to the requirements.

The focus of this revision effort is on dehumidifiers with capacities less than 75 pints/day since this category represents the vast majority of the market (i.e. 99% market share) and provides the best opportunity for further differentiation and energy gains. EPA reviewed the U.S. Department of Energy (DOE) Compliance Certification Database (CCD) and the ENERGY STAR Qualified Product List (QPL) and found that 90% of models currently available in the marketplace meet the Version 3.0 EF level. Increasing the level slightly to 2.00 EF reduces model availability to 22%, while providing the consumer a wide range of selection across all capacity sizes within the bin. EPA also evaluated consumer payback and found that in many cases the consumer will receive an immediate payback when purchasing a dehumidifier that meets the 2.00 EF level. For these reasons, EPA proposes to raise the EF requirement for less than 75 pints/day category to 2.00 EF.

The 75 to 185 pints/day category represents a small percentage of the dehumidifier market (i.e. 1% market share). EPA's market analysis found only two manufacturers that offer higher efficiency models, limiting consumer choice if EPA were to raise the current EF level. Also, products within this category already offer the consumer significant energy savings over similar products below 75 pints/day at the current level. Thus, EPA proposes to retain the ENERGY STAR criteria for the 75 to 185 pints/day category at the current level of 2.80 EF.

EPA is following the ongoing DOE federal minimum standard rulemaking process, which bases performance on the new Integrated Energy Factor (IEF) metric. When the new minimum standards are finalized, EPA will revise the specification to adopt the new test method, Appendix X1, and evaluate product performance based on the IEF metric. As the new federal minimums are scheduled to take effect three years from the date of finalization (estimated to be 2019), EPA anticipates launching the Version 5.0 development effort in 2017, such that the Version 5.0 effective date aligns with the new federal minimum standards effective date.

Stakeholders are encouraged to submit feedback on the requirements proposed.

B. Other Requirements:

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

C. Significant Digits and Rounding:

a. All calculations shall be carried out with directly measured (unrounded) values.

b. Unless otherwise specified in this specification, 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.

4) Test Requirements:

- A. One of the following sampling plans shall be used for purposes of testing for ENERGY STAR certification
- 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. Results of the tested unit may be used to certify additional individual model variations within a basic model group as long as the definition for basic model group provided in Section 1, above, is met; or
- b. Units are selected for testing and results calculated according to the sampling requirements defined in 10 CFR Part 429, Subpart B § 429.36. The certified rating must be equal to or better than the ENERGY STAR specification requirements. Results of the tested unit may be used to certify additional model variations within a basic model group as long as the definition for basic model group provided in Section 1, above, is met. Further, all individual models within a basic model group must have the same certified rating based on the applicable sampling criteria this rating must be used for all manufacturer literature, the qualified product list, and certification of compliance to DOE standards.

Note: EPA has updated the sampling requirements language to be consistent with the template language used in other ENERGY STAR specifications. Note that there are no changes made to the sampling requirements as such. Under the multi-sample option, the products shall continue to be selected for testing per the DOE samplings requirements in 10 CFR Part 429, Subpart B § 429.36.

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

Table 2: Test Methods for ENERGY STAR Qualification	
ENERGY STAR Requirement	Test Method Reference
Capacity and Energy Factor	10 CFR Appendix X to Subpart B of Part 430

Note: EPA is aware of the new federal test method, Appendix X1, and will adopt it in the next revision (Version 5.0), which will be based on the new metric and respond to the new federal minimum standards.

- 5) Effective Date:** This ENERGY STAR Dehumidifier Specification shall take effect on **TBD**. 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 on which a unit is considered to be completely assembled.

Note: EPA expects to finalize this Version 4.0 specification in early 2016. Later in this process, EPA will establish an effective date for the specification that allows manufacturers to update product literature and other marketing materials for those products that no longer meet ENERGY STAR requirements.

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