DEPARTMENT OF ENERGY

10 CFR Part 430
[EEERE–2019–BT–TP–0026]

Energy Conservation Program: Test Procedures for Consumer Products; Early Assessment Review: Dehumidifiers


ACTION: Request for information.

SUMMARY: The U.S. Department of Energy (“DOE”) is undertaking an early assessment review to determine whether to proceed with a rulemaking to amend the test procedure for dehumidifiers. Through this request for information (“RFI”), DOE seeks data and information regarding issues pertinent to whether an amended test procedure would more accurately or fully comply with the requirement that the test procedure produces results that measure energy use during a representative average use cycle for the product without being unduly burdensome to conduct. DOE welcomes written comments from the public on any subject within the scope of this document (including topics not raised in this RFI), as well as the submission of data and other relevant information.

DATES: Written comments and information are requested and will be accepted on or before July 30, 2021.

ADDRESSES: Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at www.regulations.gov. Follow the instructions for submitting comments. Alternatively, interested persons may submit comments, identified by docket number EERE–2019–BT–TP–0026, by any of the following methods:


2. Email: To Dehumidifier2019TP0026@ee.doe.gov. Include docket number EERE–2019–BT–TP–0026 in the subject line of the message.

No telefacsimiles (“faxes”) will be accepted. For detailed instructions on submitting comments and additional information on this process, see section III of this document.

Although DOE has routinely accepted public comment submissions through a variety of mechanisms, including the Federal eRulemaking Portal, email, postal mail, or hand delivery/courier, the Department has found it necessary to make temporary modifications to the comment submission process in light of the ongoing Covid-19 pandemic. DOE is currently suspending receipt of public comments via postal mail and hand delivery/courier. If a commenter finds that this change poses an undue hardship, please contact Appliance Standards Questions staff at (202) 586–1445 to discuss the need for alternative arrangements. Once the Covid-19 pandemic health emergency is resolved, DOE anticipates resuming all of its regular options for public comment submission, including postal mail and hand delivery/courier.

Docket: The docket for this activity, which includes Federal Register notices, comments, and other supporting documents/materiais, is available for review at www.regulations.gov. All documents in the docket are listed in the www.regulations.gov index. However, some documents listed in the index, such as those containing information that is exempt from public disclosure, may not be publicly available.

The docket web page can be found at www.regulations.gov/docket?D=EERE-2019–BT–TP–0026. The docket web page contains instructions on how to access all documents, including public comments, in the docket. See section III for information on how to submit comments through www.regulations.gov.


For further information on how to submit a comment or review other public comments and the docket, contact the Appliance and Equipment Standards Program staff at (202) 287–1445 or by email: ApplianceStandardsQuestions@ee.doe.gov.

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1. All references to EPCA in this document refer to the statute as amended through the Energy Act of 2020, Public Law 116–260 (Dec. 27, 2020).
period of use for the product, and not be unduly burdensome to conduct. See 85 FR 8626, 8653–8654 (Feb. 14, 2020).

As part of the early assessment, DOE publishes an RFI in the Federal Register, announcing that DOE is initiating a rulemaking proceeding and soliciting comments, data, and information on whether an amended test procedure would more accurately measure energy use during a representative average use cycle or reduce testing burden. Based on the information received in response to the RFI and DOE’s own analysis, DOE will determine whether to proceed with a rulemaking for an amended test procedure.

If DOE makes an initial determination based upon available evidence that an amended test procedure would not meet the applicable statutory criteria, DOE would engage in notice and comment rulemaking before issuing a final determination that an amended test procedure is not warranted.

Conversely, if DOE makes an initial determination that an amended test procedure would satisfy the applicable statutory criteria, DOE would undertake the preliminary stages of a rulemaking to issue an amended test procedure. Beginning such a rulemaking, however, would not preclude DOE from later making a determination that an amended test procedure would not satisfy the requirements in EPCA, based upon the full suite of DOE’s analyses. Id. at 85 FR 8654.

A. Authority and Background

EPCA, among other things, authorizes DOE to regulate the energy efficiency of a number of consumer products and certain industrial equipment. (42 U.S.C. 6291–6317) Title III, Part B of EPCA established the Energy Conservation Program for Consumer Products Other Than Automobiles, which sets forth a variety of provisions designed to improve energy efficiency. These products include dehumidifiers, the subject of this RFI. (42 U.S.C. 6293(b)(13); 42 U.S.C. 6295 (cc))

The energy conservation program under EPCA consists essentially of four parts: (1) Testing, (2) labeling, (3) Federal energy conservation standards, and (4) certification and enforcement procedures. Relevant provisions of EPCA specifically include definitions (42 U.S.C. 6291), test procedures (42 U.S.C. 6293), energy conservation standards (42 U.S.C. 6295), labeling provisions (42 U.S.C. 6294), and the authority to require information and reports from manufacturers (42 U.S.C. 6296).

Federal energy efficiency requirements for covered products established under EPCA generally supersede State laws and regulations concerning energy conservation testing, labeling, and standards. (42 U.S.C. 6297) DOE may, however, grant waivers of Federal preemption for particular State laws or regulations, in accordance with the procedures and other provisions of EPCA. (42 U.S.C. 6297(d))

The Federal testing requirements consist of test procedures that manufacturers of covered products must use as the basis for: (1) Certifying to DOE that their products comply with the applicable energy conservation standards adopted pursuant to EPCA (42 U.S.C. 6295(s)), and (2) making representations about the efficiency of those consumer products (42 U.S.C. 6293(c)). Similarly, DOE must use these test procedures to determine whether the products comply with relevant standards promulgated under EPCA. (42 U.S.C. 6295(s))

EPCA requires that the test procedure for dehumidifiers be based on the test criteria used under the ENERGY STAR Program Requirements for Dehumidifiers developed by the U.S. Environmental Protection Agency, as in effect on August 8, 2005, unless revised by DOE pursuant to 42 U.S.C. 6293. (42 U.S.C. 6293(b)(13)) Under 42 U.S.C. 6293, EPCA sets forth the criteria and procedures DOE must follow when prescribing or amending test procedures for covered products. EPCA requires that any test procedures prescribed or amended under this section be reasonably designed to produce test results which measure energy efficiency, energy use or estimated annual operating cost of a covered product during a representative average use cycle or period of use and not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3))

EPCA also requires that, at least once every 7 years, DOE review test procedures for all covered products, including dehumidifiers, to determine whether amended test procedures would more accurately or fully comply with the requirements for the test procedures to be reasonably designed to produce test results that reflect energy efficiency, energy use, and estimated operating costs during a representative average use cycle or period of use and not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(13)(A)) DOE is publishing this RFI to collect data and information to inform its decision in satisfaction of this 7-year review requirement.

B. Rulemaking History

DOE last amended the test procedure for dehumidifiers on July 31, 2015 (“July 2015 Final Rule”), to provide technical clarifications and improve repeatability of the test procedure. 80 FR 45802. The July 2015 Final Rule also established a new test procedure for dehumidifiers at appendix X1 that, among other things, established separate provisions for testing whole-home dehumidifiers. Id. DOE’s test procedures for dehumidifiers are prescribed at Title 10 of the Code of Federal Regulations (“CFR”) part 430, subpart B, appendix X1 (“appendix X1”). Manufacturers were not required to use appendix X1 until the compliance date of a subsequent amendment to the energy conservation standards for dehumidifiers.

On June 13, 2016, DOE published a final rule establishing amended energy conservation standards for dehumidifiers, for which compliance was required beginning June 13, 2019. 81 FR 38338.

II. Request for Information

DOE is publishing this RFI to collect data and information during the early assessment review to inform its decision, consistent with its obligations under EPCA, as to whether the Department should proceed with an amended test procedure rulemaking. Accordingly, in the following sections, DOE has identified a variety of issues on which it seeks input to determine whether, and if so how, amended test procedures for dehumidifiers would more accurately or fully comply with the requirements in EPCA that test procedures be reasonably designed to produce test results which reflect energy use during a representative average use cycle or period of use, without being unduly burdensome to conduct (42 U.S.C. 6293(b)(3)).

A. Scope and Definitions

EPCA defines a dehumidifier as a self-contained, electrically operated, and mechanically encased assembly consisting of—(1) a refrigerated surface (evaporator) that condenses moisture from the atmosphere; (2) a refrigerating system, including an electric motor; (3) an air-circulating fan; and (4) a means for collecting or disposing of the condensate. (42 U.S.C. 6291(34)) In codifying a regulatory definition of “dehumidifier,” DOE interpreted the statutory definition as excluding portable air conditioners, room air conditioners, and packaged terminal air conditioners, 10 CFR 430.2. Products meeting this definition are subject to DOE’s regulations for testing, certifying,
and complying with energy conservation standards.

In the July 2015 Final Rule, DOE established definitions for two dehumidifier configurations: “portable dehumidifiers” and “whole-home dehumidifiers.” 80 FR 45802, 45805. A “portable dehumidifier” is a dehumidifier designed to operate within the dehumidified space without ducting (although means may be provided for optional duct attachment). 10 CFR 430.2. A “whole-home dehumidifier” is a dehumidifier designed to be installed with ducting to deliver return process air to its inlet and dehumidified process air to one or more locations in the dehumidified space. Id.

Issue 1: DOE seeks comment on whether the current definitions of “dehumidifier,” “portable dehumidifier,” and “whole-home dehumidifier” require amendment, and if so, how the terms should be defined.

Issue 2: DOE requests comment on whether the existing equipment definitions specified in 10 CFR 430.2 for dehumidifiers require amendments to distinguish further between portable and whole-home units. If they do, DOE seeks information on what identifying characteristics may be included in potential amended definitions to differentiate better between the two configurations.

B. Test Procedure

Dehumidifiers are tested in accordance with appendix X1, which incorporates American National Standard Institute (“ANSI”)/Association of Home Appliance Manufacturers (“AHAM”) Standard DH–1–2008, “Dehumidifiers,” (“ANSI/AHAM DH–1–2008”), with modification. In part, the DOE test procedure specifies a different dry-bulb temperature (65 degrees Fahrenheit (“°F”)) for portable dehumidifiers and 73 °F for whole-home dehumidifiers) than ANSI/AHAM DH–1–2008, while still maintaining the relative humidity specified by ANSI/AHAM DH–1–2008. See Section 4.1.1 of appendix X1. Appendix X1 also includes instructions regarding instrumentation, condensate collection, control settings, setup, and ducting for whole-home dehumidifiers. See Sections 3.1.2.2; 3.1.1.4; 3.1.1.5; 3.1.1.1; and 3.1.3 of appendix X1.

Under the current test procedure, there is a single method to measure a dehumidifier’s product capacity. A unit’s capacity is the volume of water, in pints, the unit removes from the ambient air per day, normalized to a standard ambient temperature and relative humidity. See Section 2.14 of appendix X1. The Integrated Energy Factor (“IEF”), representing the efficiency of the unit expressed in liters per kilowatt-hour, is the ratio between the capacity and the combined amount of 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. See Section 5.4 of appendix X1.

1. Updates to Industry Standards

As discussed, the dehumidifier test procedure at appendix X1 references ANSI/AHAM DH–1–2008, an industry test procedure for dehumidifiers, with modification. In 2017, AHAM published a revision to ANSI/AHAM DH–1 (“ANSI/AHAM DH–1–2017”). ANSI/AHAM DH–1–2017 includes provisions for testing dehumidifier energy use in off-cycle, inactive, and off modes, and for including energy consumption in those modes in efficiency calculations. ANSI/AHAM DH–1–2017 also made other changes. First, it lowered the standard dry-bulb temperature condition for dehumidifiers from 80 °F (as in ANSI/AHAM DH–1–2008) to 65 °F (with the required wet-bulb temperature changing accordingly to maintain the same relative humidity).

Second, it tightened the maximum allowed variation for dry-bulb and wet-bulb temperature readings from 2.0 °F to 1.0 °F and from 1.0 °F to 0.5 °F, respectively. Third, it added guidance for instrumentation setup, multiple air-intakes and control settings.

Issue 3: DOE seeks comment on whether the references to ANSI/AHAM DH–1–2008 at appendix X1 should be updated to the most current version, ANSI/AHAM DH–1–2017.

Issue 4: DOE requests comment and information on whether, and if so, how updating the references in appendix X1 to ANSI/AHAM DH–1–2017 would impact the measured energy efficiency of dehumidifiers tested under the current DOE test procedure.

Issue 5: DOE requests comment on the impact on test burden were DOE to reference ANSI/AHAM DH–1–2017.

Issue 6: DOE specifically requests feedback on the reduction of the maximum-allowed temperature variation in ANSI/AHAM DH–1–2017, the potential test burden increase from this change, and any effects on reliability or reproducibility of results.

Issue 7: DOE requests information on whether any modifications to ANSI/AHAM DH–1–2017, other than modifications consistent with those made to ANSI/AHAM DH–1–2008 in the current DOE test procedure, would be needed to ensure that DOE’s test procedure produces results that are representative of an average use cycle and is not unduly burdensome to conduct.

2. Variable-Speed Dehumidifiers

DOE is aware that dehumidifiers are available on the United States market that incorporate variable-speed compressors; i.e., “variable-speed dehumidifiers.” Variable-speed dehumidifiers can avoid compressor cycling efficiency losses by modulating the compressor speed to match the amount of dehumidification required for a room. These units also avoid condensate re-evaporation into the ambient room air, which can occur when a dehumidifier cycles off its compressor but not its fan during off-cycle mode. The current test procedure in appendix X1 does not capture these “cycling losses” for single-speed dehumidifiers (and avoidance of such losses for variable-speed dehumidifiers) because the test unit operates at full capacity throughout the test.

In the July 2015 Final Rule, DOE considered a load-based test which would capture cycling behavior in dehumidifiers with single-speed compressors or speed modulation for variable-speed dehumidifiers. The load-based test would involve adding moisture to the test chamber at a fixed rate and allowing the control system of the dehumidifier to respond to changing moisture levels in the room. 80 FR 45802, 45809. DOE elected not to adopt a load-based test for the dehumidifier test procedure in the July 2015 Final Rule, due to concerns about the potential increase in test burden. Id. at 80 FR 45810.

Issue 8: DOE seeks data on single-speed dehumidifiers: (1) Their energy use when cycling on and off due to varying relative humidity in the room, (2) the extent of re-evaporation when operating in off-cycle mode, and (3) the effect of re-evaporation on dehumidification mode efficiency.

Issue 9: DOE seeks feedback and data regarding any alternative test methods that may produce results that are more representative of variable-speed dehumidifier energy consumption, including, but not limited to, a load-based test approach.

Issue 10: DOE is also interested in information about the nature and extent of the test burden associated with a load-based test for dehumidifiers.

3. Psychrometer Setup

Appendix X1, with reference to Section 4 “Instrumentation” of ANSI/AHAM DH–1–2008, requires dehumidifiers with a single air intake to
be monitored with an aspirating-type psychrometer \(^3\) perpendicular to, and one foot in front of, the unit; and, in the case of multiple air intakes, to be monitored with a separate sampling tree. See Sections 3.1.1, 3.1.1.2, 3.1.1.3 of appendix X1. In the July 2015 Final Rule, DOE considered whether certain psychrometer configuration issues, such as variable levels of residual heat from the psychrometer fan and variable air velocity influencing the accuracy of temperature sensors, were detrimental to test repeatability. 80 FR 45812–45813. As discussed in the July 2015 Final Rule, DOE was unable to determine whether any repeatability improvements are associated with adjusting the fan location in relation to the dry-bulb and wet-bulb temperature sensors, or with tightening the air velocity requirements through the psychrometer. DOE also did not have sufficient data to quantify the burdens associated with such requirements. Id. at 80 FR 45813.

Additionally, since publication of the July 2015 Final Rule, DOE has received feedback from a testing laboratory that use of a sampling tree ducted to an aspirating psychrometer is a common configuration for testing of other refrigerant-based products, and that placing the psychrometer itself in front of the test unit may impede the instrument’s ability to effectively monitor the inlet air conditions. In the July 2015 Final Rule, DOE considered a proposal to require sampling trees for testing all dehumidifiers, regardless of the number of air intakes, for consistency and repeatability. However, based on available data, DOE was unable to conclude at that time that the use of a sampling tree would be more reliable than the psychrometer-only approach. Id. at 80 FR 45812–45813.

Issue 11: DOE seeks data on the effect of residual heat from the psychrometer fan and the effects of psychrometer air velocity on temperature measurement repeatability when using a psychrometer, rather than a humidity sensor, under the current (appendix X1) test procedure.

DOE seeks information and data on measures that can be employed to minimize any such effects when using a psychrometer, as well as information regarding the repeatability of measurements when such measures are used.

Issue 12: DOE requests comment on any potential test burden increases associated with additional requirements regarding psychrometer fan placement and orientation relative to the temperature sensors, and any burden associated with reducing the acceptable psychrometer air velocity range.

Issue 13: DOE requests comment on whether it would be appropriate to require, or to allow, sampling trees to be used with aspirating psychrometers regardless of the number of air intakes for a given model, including any data confirming repeatability and especially repeatability relative to using an aspirating psychrometer without a sampling tree.

4. Smart Technology

DOE notes that many types of household products (e.g., refrigerators, dryers, room air conditioners) are now equipped with “connected” functionality, such as mobile alerts/messages, remote control, and energy information and demand response capabilities to support future smart grid interconnection. DOE is aware that certain manufacturers have incorporated some of these features, such as WiFi capability, into dehumidifiers. On September 17, 2018, DOE published an RFI on the emerging smart technology appliance and equipment market. 83 FR 46886. In that RFI, DOE sought information to better understand market trends and issues in the emerging market for appliances and commercial equipment that incorporate smart technology. DOE’s intent in issuing the RFI was to ensure that DOE did not inadvertently impede such innovation in fulfilling its statutory obligations in setting efficiency standards for covered products and equipment. DOE seeks comments, data and information on the issues presented in the RFI as they may apply to dehumidifiers.

Issue 14: DOE requests data on the prevalence of connected functionality in dehumidifiers currently on the market in the United States.

Issue 15: DOE requests information on whether the current test procedures for dehumidifiers impede the ability of manufacturers to provide smart technology operations on dehumidifiers.

5. Ventilation Air

Appendix X1 requires that any fresh-air inlet on a whole-home dehumidifier be capped and sealed during testing. See Section 3.1.3 of appendix X1. In the July 2015 Final Rule, DOE determined that, while sealing the fresh-air inlet on dehumidifiers designed to operate with the fresh-air intake open may negatively impact capacity and efficiency, those effects are not significant enough to warrant the added test burden of providing separate fresh-air inflow. 80 FR 45811. DOE also noted the lack of data regarding representative consumer use of fresh-air inlet ducts for whole-home dehumidifiers.

Issue 16: DOE requests data about the prevalence of fresh-air inlet use among whole-home dehumidifier consumers.

Issue 17: DOE seeks feedback on the test burden increases associated with adding another air-stream in the testing configuration to account for the fresh-air inlet on those whole-home dehumidifiers equipped with such a feature.

C. Other Test Procedure Topics

In addition to the issues identified earlier in this document, DOE welcomes comment on any other aspect of the existing test procedures for dehumidifiers.

III. Submission of Comments

DOE invites all interested parties to submit in writing by July 30, 2021, comments and information on matters addressed in this notice and on other matters relevant to DOE’s consideration of amended test procedures for dehumidifiers. These comments and information will aid in the development of a test procedure notice of proposed rulemaking for dehumidifiers if DOE determines that amended test procedures may be appropriate for these products.

Submitting comments via www.regulations.gov. The www.regulations.gov web page will require you to provide your name and contact information. Your contact information will be viewable to DOE Building Technologies staff only. Your contact information will not be publicly viewable except for your first and last names, organization name (if any), and submitter representative name (if any). If your comment is not processed properly because of technical difficulties, DOE will use this information to contact you. If DOE cannot read your comment due to technical difficulties and cannot contact you for clarification, DOE may not be able to consider your comment. However, your contact information will be publicly viewable if you include it in the comment or in any documents attached to your comment. Any information that you do not want to be publicly viewable should not be included in your comment, nor in any document attached to your comment. Following this instruction, persons viewing comments will see only first and last names, organization names,
Confidential Business Information. According to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via email two well-marked copies: One copy of the document marked confidential including all the information believed to be confidential, and one copy of the document marked “non-confidential” with the information believed to be confidential deleted. Submit these documents via email to Dehumidifier2019TP0026@ee.doe.gov. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

It is DOE’s policy that all comments may be included in the public docket, without change and as received, including any personal information provided in the comments (except information deemed to be exempt from public disclosure).

DOE considers public participation to be a very important part of the process for developing test procedures and energy conservation standards. DOE actively encourages the participation and interaction of the public during the comment period in each stage of this process. Interactions with and between members of the public provide a balanced discussion of the issues and assist DOE in the process. Anyone who wishes to be added to the DOE mailing list to receive future notices and information about this process should contact Appliance and Equipment Standards Program staff at (202) 287–1445 or via email at ApplianceStandardsQuestions@ ee.doe.gov.

Signing Authority

This document of the Department of Energy was signed on June 25, 2021, by Kelly Speakes-Backman, Principal Deputy Assistant Secretary and Acting Assistant Secretary for Energy Efficiency and Renewable Energy, pursuant to delegated authority from the Secretary of Energy. That document with the original signature and date is maintained by DOE. For administrative purposes only, and in compliance with requirements of the Office of the Federal Register, the undersigned DOE Federal Register Liaison Officer has been authorized to sign and submit the document in electronic format for publication, as an official document of the Department of Energy. This administrative process in no way alters the legal effect of this document upon publication in the Federal Register.