under Rule 2 of 10 CFR 1024.4 and the request shall be granted notwithstanding any provisions to the contrary of Rule 2.

[61 FR 35895, July 8, 1996, as amended at 64 FR 46114, Aug. 24, 1999]

## Subpart C—Implementation of Special Projects Financial Assistance

### § 420.30 Purpose and scope.

(a) This subpart sets forth DOE's policies and procedures for implementing special projects financial assistance under this part.

(b) For years in which such funding is available, States may apply for financial assistance to undertake a variety of State-oriented energy-related special projects activities in addition to the funds provided under the regular SEP grants.

(c) The types of funded activities may vary from year to year, and from State to State, depending upon funds available for each type of activity and DOE and State priorities.

(d) A number of end-use sector programs in the Office of Energy Efficiency and Renewable Energy participate in the funding of these activities, and the projects must meet the requirements of those programs.

(e) The purposes of the special project activities are:

(1) To utilize States to accelerate deployment of energy efficiency, renewable energy, and alternative transportation fuel technologies;

(2) To facilitate the commercialization of emerging and underutilized energy efficiency and renewable energy technologies; and

(3) To increase the responsiveness of Federally funded technology development efforts to the needs of the marketplace.

### § 420.31 Notice of availability.

(a) If in any fiscal year DOE has funds available for special projects, DOE shall publish in the FEDERAL REGISTER one or more notice(s) of availability of SEP special projects financial assistance.

(b) Each notice of availability shall cite this part and shall include:

(1) Brief descriptions of the activities for which funding is available;

(2) The amount of money DOE has available or estimates it will have available for award for each type of activity, and the total amount available;

(3) The program official to contact for additional information, application forms, and the program guidance/solicitation document; and

(4) The dates when:

(i) The program guidance/solicitation will be available; and

(ii) The applications for financial assistance must be received by DOE.

### § 420.32 Program guidance/solicitation.

After the publication of the notice of availability in the FEDERAL REGISTER, DOE shall, upon request, provide States interested in applying for one or more project(s) under the special projects financial assistance with a detailed program guidance/solicitation that will include:

(a) The control number of the program;

(b) The expected duration of DOE support or period of performance;

(c) An application form or the format to be used, location for application submission, and number of copies required;

(d) The name of the DOE program office contact from whom to seek additional information;

(e) Detailed descriptions of each type of program activity for which financial assistance is being offered;

(f) The amount of money available for award, together with any limitations as to maximum or minimum amounts expected to be awarded;

(g) Deadlines for submitting applications;

(h) Evaluation criteria that DOE will apply in the selection and ranking process for applications for each program activity;

(i) The evaluation process to be applied to each type of program activity;

(j) A listing of program policy factors if any that DOE may use in the final selection process, in addition to the results of the evaluations, including:

(1) The importance and relevance of the proposed applications to SEP and the participating programs in the Office of Energy Efficiency and Renewable Energy; and

(2) Geographical diversity;
(k) Reporting requirements;
(l) References to:
(1) Statutory authority for the program;
(2) Applicable rules; and
(3) Other terms and conditions applicable to awards made under the program guidance/solicitation; and
(m) A statement that DOE reserves the right to fund in whole or in part, any, all, or none of the applications submitted.

### § 420.33 Application requirements.

(a) Consistent with § 420.32 of this part, DOE shall set forth general and special project activity-specific requirements for applications for special projects financial assistance in the program guidance/solicitation.
(b) In addition to any other requirements, all applications shall provide:
(1) A detailed description of the proposed project, including the objectives of the project in relationship to DOE's program and the State's plan for carrying it out;
(2) A detailed budget for the entire proposed period of support, with written justification sufficient to evaluate the itemized list of costs provided on the entire project; and
(3) An implementation schedule for carrying out the project.
(c) DOE may, subsequent to receipt of an application, request additional budgetary information from a State when necessary for clarification or to make informed preaward determinations.
(d) DOE may return an application which does not include all information and documentation required by this subpart, 10 CFR part 600, or the program guidance/solicitation, when the nature of the omission precludes review of the application.

[61 FR 35895, July 8, 1996, as amended at 64 FR 46114, Aug. 24, 1999]

### § 420.34 Matching contributions or cost-sharing.

DOE may require (as set forth in the program guidance/solicitation) States to provide either:
(a) A matching contribution of at least a specified percentage of the Federal financial assistance award; or
(b) A specified share of the total cost of the project for which financial assistance is provided.

### § 420.35 Application evaluation.

(a) DOE staff at the cognizant Regional Office shall perform an initial review of all applications to ensure that the State has provided the information required by this subpart, 10 CFR part 600, and the program guidance/solicitation.
(b) DOE shall group, and technically evaluate according to program activity, all applications determined to be complete and satisfactory.
(c) DOE shall select evaluators on the basis of their professional qualifications and expertise relating to the particular program activity being evaluated.
(1) DOE anticipates that evaluators will primarily be DOE employees; but
(2) If DOE uses non-DOE evaluators, DOE shall require them to comply with all applicable DOE rules or directives concerning the use of outside evaluators.

[61 FR 35895, July 8, 1996, as amended at 64 FR 46114, Aug. 24, 1999]

### § 420.36 Evaluation criteria.

The evaluation criteria, including program activity-specific criteria, will be set forth in the program guidance/solicitation document.

### § 420.37 Selection.

(a) DOE may make selection of applications for award based on:
(1) The findings of the technical evaluations;
(2) The priorities of DOE, SEP, and the participating program offices;
(3) The availability of funds for the various special project activities; and
(4) Any program policy factors set forth in the program guidance/solicitation.
(b) The Director, Office of State and Community Programs makes the final selections of projects to be awarded financial assistance.

### § 420.38 Special projects expenditure prohibitions and limitations.

(a) Expenditures under the special projects are subject to 10 CFR part 600 and to any prohibitions and limitations

required by the DOE programs that are providing the special projects funding.

(b) DOE must state any expenditure prohibitions or limitations specific to a particular category of special projects in the annual SEP special projects solicitation/guidance.

[64 FR 46114, Aug. 24, 1999]

# PART 429—CERTIFICATION, COMPLIANCE, AND ENFORCEMENT FOR CONSUMER PRODUCTS AND COMMERCIAL AND INDUSTRIAL EQUIPMENT

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AUTHORITY: 42 U.S.C. 6291–6317; 28 U.S.C. 2461 note.

SOURCE: 76 FR 12451, Mar. 7, 2011, unless otherwise noted.

## Subpart A—General Provisions

### § 429.1 Purpose and scope.

This part sets forth the procedures for certification, determination and enforcement of compliance of covered products and covered equipment with the applicable energy conservation standards set forth in parts 430 and 431 of this subchapter.

[87 FR 63646, Oct. 19, 2022]

### § 429.2 Definitions.

(a) The definitions found in 10 CFR parts 430 and 431 apply for purposes of this part.

(b) The following definitions apply for the purposes of this part. Any words or terms defined in this section or elsewhere in this part shall be defined as provided in sections 321 and 340 of the Energy Policy Conservation Act, as amended, hereinafter referred to as ''the Act.''

*Energy conservation standard* means any standards meeting the definitions of that term in 42 U.S.C. 6291(6) and 42 U.S.C. 6311(18) as well as any other water conservation standards and design requirements found in this part or parts 430 or 431.

*Engineered-to-order* means a basic model of commercial water heating equipment, commercial packaged boiler, commercial heating, ventilation, and air conditioning (HVAC) equipment, or commercial refrigeration equipment that is: Not listed in any catalogs or marketing literature and designed and built to specific customer requirements. A unit of an engineered-to-order basic model is not offered as a set of options (e.g., configure-to-order, menu-system).

*Independent* means, in the context of a nationally recognized certification program, or accreditation program for electric motors, an entity that is not controlled by, or under common control with, electric motor manufacturers, importers, private labelers, or vendors, and that has no affiliation, financial ties, or contractual agreements, apparently or otherwise, with such entities that would:

(i) Hinder the ability of the program to evaluate fully or report the measured or calculated energy efficiency of any electric motor, or

(ii) Create any potential or actual conflict of interest that would undermine the validity of said evaluation. For purposes of this definition, financial ties or contractual agreements between an electric motor manufacturer, importer, private labeler or vendor and a nationally recognized certification program, or accreditation program exclusively for certification or accreditation services does not negate an otherwise independent relationship.

*Manufacturer's model number* means the identifier used by a manufacturer to uniquely identify the group of identical or essentially identical covered products or covered equipment to which a particular unit belongs. The manufacturer's model number typically appears on the product nameplates, in product catalogs and in other product advertising literature.

[76 FR 12451, Mar. 7, 2011, as amended at 79 FR 25499, May 5, 2014; 81 FR 4144, Jan. 25, 2016; 82 FR 1099, Jan. 4, 2017; 87 FR 63646, Oct. 19, 2022]

### § 429.3 Sources for information and guidance.

(a) *General.* The standards listed in this paragraph are referred to in §§ 429.73 and 429.74 and are not incorporated by reference. These sources are provided here for information and guidance only.

(b) *ISO/IEC.* International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, CP 56, CH–1211 Geneva 20, Switzerland/International Electrotechnical Commission, 3, rue de Varembé, P.O. Box 131, CH–1211 Geneva 20, Switzerland.

(1) International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC), (''ISO/IEC'') 17025, ''General requirements for the competence of calibration and testing laboratories,'' November 2017.

(2) [Reserved]

(c) *NVLAP.* National Voluntary Laboratory Accreditation Program, National Institute of Standards and Technology, 100 Bureau Drive, M/S 2140, Gaithersburg, MD 20899–2140, 301–975–4016, or go to *www.nist.gov/nvlap/.* Also see *http://www.nist.gov/nvlap/nvlap-handbooks.cfm.*

(1) National Institute of Standards and Technology (NIST) Handbook 150, ''NVLAP Procedures and General Requirements,'' 2000 edition, August 2020.

(2) National Institute of Standards and Technology (NIST) Handbook 150–10, ''Efficiency of Electric Motors,'' 2020 edition, April 2020.

[87 FR 63646, Oct. 19, 2022]

### § 429.4 Materials incorporated by reference.

(a) Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, the U.S. Department of Energy (DOE) must publish a document in the FEDERAL REGISTER and the material must be available to the public. All approved incorporation by reference (IBR) material is available for inspection at DOE and at the National Archives and Records Administration (NARA). Contact DOE at: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, Sixth Floor, 950 L'Enfant Plaza SW, Washington, DC 20024, (202) 586–9127, *Buildings@ee.doe.gov, www.energy.gov/eere/buildings/building-technologies-office.* For information on the availability of this material at NARA, email: *fr.inspection@nara.gov,* or go to:*www.archives.gov/federal-register/cfr/ibr-locations.html.* The material may be obtained from the sources in the following paragraphs of this section.

(b) *AHAM.* Association of Home Appliance Manufacturers, 1111 19th Street, NW., Suite 402, Washington, DC 20036, 202–872–5955, or go to *www.aham.org.*

(1) ANSI/AHAM PAC–1–2015 (''ANSI/AHAM PAC–1–2015''), Portable Air Conditioners, June 19, 2015, IBR approved for § 429.62.

(2) AHAM PAC–1–2022, *Energy Measurement Test Procedure for Portable Air Conditioners,* Copyright 2022. IBR approved for § 429.62.

(c) *AHRI.* Air-Conditioning, Heating, and Refrigeration Institute, 2111 Wilson Blvd., Suite 500, Arlington, VA 22201, (703) 524–8800, or go to: *www.ahrinet.org*.

(1) AHRI Standard 210/240–2023, (''AHRI 210/240–2023''), *2023 Standard for Performance Rating of Unitary Air-conditioning & Air-source Heat Pump Equipment*, copyright 2020; IBR approved for § 429.67.

(2) AHRI Standard 390 (I–P)–2021, (''AHRI 390–2021''), *2021 Standard for Performance Rating of Single Package Vertical Air-conditioners And Heat Pumps,* IBR approved for § 429.134.

(3) AHRI Standard 600–2023 (I–P) (''AHRI 600–2023''), *2023 Standard for Performance Rating of Water/Brine to Air Heat Pump Equipment,* approved September 11, 2023; IBR approved for § 429.43.

(4) AHRI Standard 1230(I–P) (''AHRI 1230–2021''), *2021 Standard for Performance Rating of Variable Refrigerant Flow (VRF) Multi-Split Air-Conditioning and Heat Pump Equipment,* copyright 2021; IBR approved for §§ 429.43; 429.134.

(5) AHRI Standard 1340–2023 (I–P) (''AHRI 1340–2023''), *2023 Standard for Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment*, approved November 16, 2023; IBR approved for §§ 429.43; 429.134.

(6) AHRI Standard 1360–2022 (I–P) (''AHRI 1360–2022''), *2022 Standard for Performance Rating of Computer and Data Processing Room Air Conditioners,* copyright 2022; IBR approved for § 429.43.

(7) AHRI Standard 1500–2015, (''ANSI/AHRI Standard 1500–2015''), ''2015 Standard for Performance Rating of Commercial Space Heating Boilers,'' ANSI approved November 28, 2014: Figure C9, Suggested Piping Arrangement for Hot Water Boilers; IBR approved for § 429.60.

(d) *ASHRAE.* The American Society of Heating, Refrigerating and Air-Conditioning Engineers. 180 Technology Parkway NW, Peachtree Corners, GA 30092; (404) 636–8400, *www.ashrae.org*.

(1) ANSI/ASHRAE Standard 37–2009 (''ASHRAE 37–2009''), *Methods of Testing for Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment,* ASHRAE approved June 24, 2009; IBR approved for § 429.134.

(2) ANSI/ASHRAE 41.2–1987 (RA 92) (''ASHRAE 41.2–1987''), *Standard Methods For Laboratory Airflow Measurement*, ANSI reaffirmed April 22, 1992; IBR approved for § 429.134.

(e) *HI.* Hydraulic Institute, 6 Campus Drive, First Floor North, Parsippany, NJ 07054–4406, 973–267–9700. *www.Pumps.org*.

(1) HI 40.6–2014, (''HI 40.6–2014–B''), ''Methods for Rotodynamic Pump Efficiency Testing,'', (except for sections 40.6.4.1 ''Vertically suspended pumps'', 40.6.4.2 ''Submersible pumps'',40.6.5.3 ''Test report'', 40.6.5.5 ''Test conditions'', 40.6.5.5.2 ''Speed of rotation during testing'', and 40.6.6.1 ''Translation of test results to rated speed of rotation'', and Appendix A ''Testing arrangements (normative)'': A.7 ''Testing at temperatures exceeding 30 °C (86 °F)'', and Appendix B ''Reporting of test results (normative)''), copyright 2014, IBR approved for § 429.134.

(2) [Reserved]

(f) *ISO.* International Organization for Standardization, ch. de la Voie-Creuse CP 56 CH–1211 Geneva 20 Switzerland, telephone + 41 22 749 01 11, or go to *www.iso.org/iso*.

(1) International Organization for Standardization (ISO)/International Electrotechnical Commission, (''ISO/IEC 17025:2005(E)''), ''General requirements for the competence of testing and calibration laboratories'', Second edition, May 15, 2005, IBR approved for § 429.110.

(2) [Reserved]

(g) *NSF.* NSF International. 789 N. Dixboro Road, Ann Arbor, MI 48105, (743) 769–8010. *www.nsf.org*.

(1) NSF/ANSI 50–2015, ''Equipment for Swimming Pools, Spas, Hot Tubs and Other Recreational Water Facilities,'' Annex C—''Test methods for the evaluation of centrifugal pumps,'' Section C.3, ''self-priming capability,'' ANSI approved January 26, 2015, IBR approved for §§ 429.59 and 429.134.

(2) [Reserved]

(h) *UL.* Underwriters Laboratories, 333 Pfingsten Road, Northbrook, IL 60062; (841) 272–8800; *www.ul.com.*

(1) UL 1004–10 (''UL 1004–10:2022''), *Standard for Safety for Pool Pump Motors,* Revised First Edition, Dated

March 24, 2022; IBR approved for § 429.134.

(2) [Reserved]

[76 FR 12451, Mar. 7, 2011, as amended at 77 FR 65977, Oct. 31, 2012; 80 FR 79668, Dec. 23, 2015; 81 FR 35264, June 1, 2016; 81 FR 89303, Dec. 9, 2016; 81 FR 90118, Dec. 13, 2016; 82 FR 36917, Aug. 7, 2017; 87 FR 63891, Oct. 20, 2022; 87 FR 75166, Dec. 7, 2022; 87 FR 77317, Dec. 16, 2022; 88 FR 21836, Apr. 11, 2023; 88 FR 31126, May 15, 2023; 88 FR 67040, Sept. 28, 2023; 88 FR 84226, Dec. 4, 2023; 89 FR 44032, May 20, 2024; 89 FR 82059, Oct. 9, 2024]

### § 429.5 Imported products.

(a) Any person importing any covered product or covered equipment into the United States shall comply with the provisions of this part, and parts 430 and 431, and is subject to the remedies of this part.

(b) Any covered product or covered equipment offered for importation in violation of this part, or part 430 or 431, shall be refused admission into the customs territory of the United States under rules issued by the U.S. Customs and Border Protection (CBP) and subject to further remedies as provided by law, except that CBP may, by such rules, authorize the importation of such covered product or covered equipment upon such terms and conditions (including the furnishing of a bond) as may appear to CBP appropriate to ensure that such covered product or covered equipment will not violate this part, or part 430 or 431, or will be exported or abandoned to the United States.

### § 429.6 Exported products.

This part, and parts 430 and 431, shall not apply to any covered product or covered equipment if:

(a) Such covered product or covered equipment is manufactured, sold, or held for sale for export from the United States or is imported for export;

(b) Such covered product or covered equipment or any container in which it is enclosed, when distributed in commerce, bears a stamp or label stating ''NOT FOR SALE FOR USE IN THE UNITED STATES''; and

(c) Such product is, in fact, not distributed in commerce for use in the United States.

### § 429.7 Confidentiality.

(a) The following records are not exempt from public disclosure: Product or equipment type; product or equipment class; private labeler name; brand name; applicable model number(s) unless that information meets the criteria specified in paragraph (b) of this section; energy or water ratings submitted by manufacturers to DOE pursuant to § 429.12(b)(13); whether the certification was based on a test procedure waiver and the date of such waiver; and whether the certification was based on exception relief from the Office of Hearing and Appeals and the date of such relief.

(b) An individual, manufacturer model number is public information unless:

(1) The individual, manufacturer model number is a unique model number of a commercial packaged boiler, commercial water heating equipment, commercial HVAC equipment or commercial refrigeration equipment that was developed for an individual customer,

(2) The individual, manufacturer model number is not displayed on product literature, and

(3) Disclosure of the individual, manufacturer model number would reveal confidential business information as described at § 1004.11 of this title—in which case, under these limited circumstances, a manufacturer may identify the individual manufacturer model number as a private model number on a certification report submitted pursuant to § 429.12(b)(6).

(c) Pursuant to the provisions of 10 CFR 1004.11(e), any person submitting information or data which the person believes to be confidential and exempt by law from public disclosure should—at the time of submission—submit:

(1) One complete copy, and one copy from which the information believed to be confidential has been deleted.

(2) A request for confidentiality containing the submitter's views on the reasons for withholding the information from disclosure, including:

(i) A description of the items sought to be withheld from public disclosure,

(ii) Whether and why such items are customarily treated as confidential within the industry,

(iii) Whether the information is generally known by or available from other sources,

(iv) Whether the information has previously been made available to others without obligation concerning its confidentiality,

(v) An explanation of the competitive injury to the submitting person which would result from public disclosure,

(vi) A date upon which such information might lose its confidential nature due to the passage of time, and

(vii) Why disclosure of the information would be contrary to the public interest.

(d) In accordance with the procedures established in 10 CFR 1004.11(e), DOE shall make its own determination with regard to any claim that information submitted be exempt from public disclosure.

[76 FR 12451, Mar. 7, 2011, as amended at 79 FR 25499, May 5, 2014; 80 FR 151, Jan. 5, 2015]

### § 429.8 Subpoena.

For purposes of carrying out parts 429, 430, and 431, the General Counsel (or delegee), may sign and issue subpoenas for the attendance and testimony of witnesses and the production of relevant books, records, papers, and other documents, and administer oaths. Witnesses summoned under the provisions of this section shall be paid the same fees and mileage as are paid to witnesses in the courts of the United States. In case of contumacy by, or refusal to obey a subpoena served, upon any persons subject to parts 429, 430, or 431, the General Counsel (or delegee) may seek an order from the District Court of the United States for any District in which such person is found or resides or transacts business requiring such person to appear and give testimony, or to appear and produce documents. Failure to obey such order is punishable by such court as contempt thereof.

## Subpart B—Certification

### § 429.10 Purpose and scope.

This subpart sets forth the procedures for manufacturers to certify that their covered products and covered equipment comply with the applicable energy conservation standards.

### § 429.11 General sampling requirements for selecting units to be tested.

(a) When testing of covered products or covered equipment is required to comply with section 323(c) of the Act, or to comply with rules prescribed under sections 324, 325, 342, 344, 345 or 346 of the Act, a sample comprised of production units (or units representative of production units) of the basic model being tested must be selected at random and tested and must meet the criteria found in §§ 429.14 through 429.69 and § 429.76. Components of similar design may be substituted without additional testing if the substitution does not affect energy or water consumption. Any represented values of measures of energy efficiency, water efficiency, energy consumption, or water consumption for all individual models represented by a given basic model must be the same, except for central air conditioners and central air conditioning heat pumps, as specified in § 429.16; and

(b) The minimum number of units tested shall be no less than two, except where:

(1) A different minimum limit is specified in §§ 429.14 through 429.69 and § 429.76; or

(2) Only one unit of the basic model is produced, in which case, that unit must be tested and the test results must demonstrate that the basic model performs at or better than the applicable standard(s). If one or more units of the basic model are manufactured subsequently, compliance with the default sampling and representations provisions is required.

[87 FR 63646, Oct. 19, 2022, as amended at 88 FR 14043, Mar. 6, 2023; 88 FR 27387, May 1, 2023; 88 FR 38626, June 13, 2023]

### § 429.12 General requirements applicable to certification reports.

(a) *Certification.* Each manufacturer, before distributing in commerce any basic model of a covered product or covered equipment subject to an applicable energy conservation standard set forth in parts 430 or 431, and annually

thereafter on or before the dates provided in paragraph (d) of this section, shall submit a certification report to DOE certifying that each basic model meets the applicable energy conservation standard(s). The certification report(s) must be submitted to DOE in accordance with the submission procedures of paragraph (h) of this section.

(b) *Certification report.* A certification report shall include a compliance statement (see paragraph (c) of this section), and for each basic model, the information listed in this paragraph (b).

(1) Product or equipment type;

(2) Product or equipment class (as denoted in the provisions of part 430 or 431 of this chapter containing the applicable energy conservation standard);

(3) Manufacturer's name and address;

(4) Private labeler's name(s) and address(es) (if applicable);

(5) Brand name;

(6) For each brand, the basic model number and the manufacturer's individual model number(s) in that basic model with the following exceptions: For external power supplies that are certified based on design families, the design family model number and the individual manufacturer's model numbers covered by that design family must be submitted for each brand. For distribution transformers, the basic model number or kVA grouping model number (depending on the certification method) for each brand must be submitted. For commercial HVAC, WH, and refrigeration equipment, an individual manufacturer model number may be identified as a ''private model number'' if it meets the requirements of § 429.7(b).

(7) Whether the submission is for a new model, a discontinued model, a correction to a previously submitted model, data on a carryover model, or a model that has been found in violation of a voluntary industry certification program;

(8) The test sample size as follows:

(i) The number of units tested for the basic model; or

(ii) In the case of single-split system or single-package central air conditioners and central air conditioning heat pumps; air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h; air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h; or multi-split, multi-circuit, or multi-head mini-split systems other than the ''tested combination,'' the number of units tested for each individual combination or individual model; or

(iii) If an AEDM was used in lieu of testing, enter ''0'' (and in the case of central air conditioners and central air conditioning heat pumps, this must be indicated separately for each metric);

(9) The certifying party's U.S. Customs and Border Protection (CBP) importer identification numbers assigned by CBP pursuant to 19 CFR 24.5, if applicable;

(10) Whether certification is based upon any waiver of test procedure requirements under § 430.27 or § 431.401 of this chapter and the date(s) of such waiver(s);

(11) Whether certification is based upon any exception relief from an applicable energy conservation standard and the date such relief was issued by DOE's Office of Hearings and Appeals;

(12) If the test sample size is listed as ''0'' to indicate the certification is based upon the use of an alternate way of determining measures of energy conservation, identify the method used for determining measures of energy conservation (such as ''AEDM,'' or linear interpolation). Manufacturers of commercial packaged boilers, commercial water heating equipment, commercial refrigeration equipment, commercial HVAC equipment, central air conditioners and central air conditioning heat pumps, and walk-in coolers and walk-in freezers must provide the manufacturer's designation (name or other identifier) of the AEDM used; and

(13) Product specific information listed in §§ 429.14 through 429.68.

(c) *Compliance statement.* The compliance statement required by paragraph (b) of this section shall include the date, the name of the company official signing the statement, and his or her signature, title, address, telephone number, and facsimile number and shall certify that:

(1) The basic model(s) complies with the applicable energy conservation standard(s);

(2) All required testing has been conducted in conformance with the applicable test requirements prescribed in parts 429, 430 and 431, as appropriate, or in accordance with the terms of an applicable test procedure waiver;

(3) All information reported in the certification report is true, accurate, and complete; and

(4) The manufacturer is aware of the penalties associated with violations of the Act, the regulations thereunder, and 18 U.S.C. 1001 which prohibits knowingly making false statements to the Federal Government.

(d) *Annual filing.* All data required by paragraphs (a) through (c) of this section shall be submitted to DOE annually, on or before the following dates:

TABLE 1 TO PARAGRAPH (d)

| Product category | Deadline for data submission |
|---|---|
| Portable air conditioners | February 1. |
| Fluorescent lamp ballasts; Compact fluorescent lamps; General service fluorescent lamps, general service incandescent lamps, and incandescent reflector lamps; Candelabra base incandescent lamps and intermediate base incandescent lamps; Ceiling fans; Ceiling fan light kits; Showerheads; Faucets; Water closets; and Urinals. | March 1. |
| Water heaters; Consumer furnaces; Pool heaters; Commercial water heating equipment; Commercial packaged boilers; Commercial warm air furnaces; Commercial unit heaters; and Furnace fans. | May 1. |
| Dishwashers; Commercial pre-rinse spray valves; Illuminated exit signs; Traffic signal modules and pedestrian modules; and Distribution transformers. | June 1. |
| Room air conditioners; Central air conditioners and central air conditioning heat pumps; Commercial heating, ventilating, air conditioning (HVAC) equipment (excluding air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 British thermal units per hour and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with less than 65,000 British thermal units per hour cooling capacity); and Air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 British thermal units per hour and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 British thermal units per hour. | July 1. |
| Consumer refrigerators, refrigerator-freezers, and freezers; Commercial refrigerators, freezers, and refrigerator-freezers; Automatic commercial ice makers; Refrigerated bottled or canned beverage vending machines; Walk-in coolers and walk-in freezers; and Consumer miscellaneous refrigeration products. | August 1. |
| Torchieres; Dehumidifiers; Metal halide lamp ballasts and fixtures; External power supplies; Pumps; Dedicated-purpose pool pump motors; Compressors; and Battery chargers. | September 1. |
| Residential clothes washers; Residential clothes dryers; Direct heating equipment; Cooking products; and Commercial clothes washers. | October 1. |
| Air Cleaners | December 1. |

(e) *New model filing.* (1) In addition to the annual filing schedule in paragraph (d) of this section, any new basic models must be certified pursuant to paragraph (a) of this section before distribution in commerce. A modification to a model that increases the model's energy or water consumption or decreases its efficiency resulting in rerating must be certified as a new basic model pursuant to paragraph (a) of this section.

(2) For distribution transformers, the manufacturer shall submit all information required in paragraphs (b) and (c) of this section for the new basic model, unless the manufacturer has previously submitted to the Department a certification report for a basic model of distribution transformer that is in the same kVA grouping as the new basic model.

(f) *Discontinued model filing.* When production of a basic model has ceased and it is no longer being sold or offered for sale by the manufacturer or private labeler, the manufacturer must report this discontinued status to DOE as part of the next annual certification report following such cessation. For each basic model, the report must include the information specified in paragraphs (b)(1) through (7) of this section, except that for integrated light-emitting diode lamps and for compact fluorescent lamps, the manufacturer must

submit a full certification report, including all of the information required by paragraph (b) of this section and the product-specific information required by § 429.56(b)(2) or § 429.35(b)(2), respectively.

(g) *Third party submitters.* A manufacturer may elect to use a third party to submit the certification report to DOE (for example, a trade association, independent test lab, or other authorized representative, including a private labeler acting as a third party submitter on behalf of a manufacturer); however, the manufacturer is responsible for submission of the certification report to DOE. DOE may refuse to accept certification reports from third party submitters who have failed to submit reports in accordance with the rules of this part. The third party submitter must complete the compliance statement as part of the certification report. Each manufacturer using a third party submitter must have an authorization form on file with DOE. The authorization form includes a compliance statement, specifies the third party authorized to submit certification reports on the manufacturer's behalf and provides the contact information and signature of a company official.

(h) *Method of submission.* Reports required by this section must be submitted to DOE electronically at *http://www.regulations.doe.gov/ccms* (CCMS). A manufacturer or third party submitter can find product-specific templates for each covered product or covered equipment with certification requirements online at *https://www.regulations.doe.gov/ccms/templates.html*. Manufacturers and third party submitters must submit a registration form, signed by an officer of the company, in order to obtain access to CCMS.

(i) *Compliance dates.* For any product subject to an applicable energy conservation standard for which the compliance date has not yet occurred, a certification report must be submitted not later than the compliance date for the applicable energy conservation standard. The covered products enumerated below are subject to the stated compliance dates for initial certification:

(1) Dedicated-purpose pool pump motors <0.5 total horsepower (THP) and dedicated-purpose pool pump motors ≥1.15 THP and ≤5 THP, September 29, 2025.

(2) Dedicated-purpose pool pump motors ≥0.5 THP and <1.15 THP, September 28, 2027.

(3) Direct expansion-dedicated outdoor air systems, May 1, 2024.

[76 FR 12451, Mar. 7, 2011; 76 FR 24762, May 2, 2011, as amended at 76 FR 38292, June 30, 2011; 76 FR 65365, Oct. 21, 2011; 77 FR 76830, Dec. 31, 2012; 78 FR 79593, Dec. 31, 2013; 79 FR 25500, May 5, 2014; 79 FR 38208, July 3, 2014; 81 FR 4430, Jan. 26, 2016; 81 FR 37049, June 8, 2016; 81 FR 43425, July 1, 2016; 81 FR 46789, July 18, 2016; 81 FR 59415, Aug. 29, 2016; 81 FR 95798, Dec. 28, 2016; 85 FR 1446, 1591, Jan. 10, 2020; 87 FR 43976, July 22, 2022; 87 FR 53637, Aug. 31, 2022; 87 FR 77317, Dec. 16, 2022; 89 FR 82059, Oct. 9, 2024]

### § 429.13 Testing requirements.

(a) The determination that a basic model complies with an applicable energy conservation standard shall be determined from the values derived pursuant to the applicable testing and sampling requirements set forth in parts 429, 430 and 431. The determination that a basic model complies with the applicable design standard shall be based upon the incorporation of specific design requirements in parts 430 and 431 or as specified in section 325 and 342 of the Act.

(b) Where DOE has determined a particular entity is in noncompliance with an applicable standard or certification requirement, DOE may impose additional testing requirements as a remedial measure.

### § 429.14 Consumer refrigerators, refrigerator-freezers and freezers.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to residential refrigerators, refrigerator-freezers and freezers; and

(2) For each basic model of residential refrigerators, refrigerator-freezers, and freezers, a sample of sufficient size shall be randomly selected and tested to ensure that—

(i) Any represented value of estimated annual operating cost, energy consumption, or other measure of energy consumption of a basic model for

which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

or,

(B) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.10, where:

$$UCL = \bar{x} + t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(ii) Any represented value of the energy factor or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

or,

(B) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.90, where:

$$LCL = \bar{x} - t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(3) The value of total refrigerated volume of a basic model reported in accordance with paragraph (b)(2) of this section shall be the mean of the total refrigerated volumes measured for each tested unit of the basic model or the total refrigerated volume of the basic model as calculated in accordance with § 429.72(c). The value of adjusted total volume of a basic model reported in accordance with paragraph (b)(2) of this section shall be the mean of the adjusted total volumes measured for each tested unit of the basic model or the adjusted total volume of the basic model as calculated in accordance with § 429.72(c).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to residential refrigerators, refrigerator-freezers and freezers; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The annual energy use in kilowatt hours per year (kWh/yr); the total refrigerated volume in cubic feet ($ft^3$); and the adjusted total volume in cubic feet ($ft^3$).

(3) Pursuant to § 429.12(b)(13), a certification report shall include the following additional product-specific information: Whether the basic model has variable defrost control (in which case, manufacturers must also report the values, if any, of $CT_L$ and $CT_M$ (See section 5.3 of appendix A and appendix B to subpart B of 10 CFR part 430) used in the calculation of energy consumption), whether the basic model has variable anti-sweat heater control (in which case, manufacturers must also report the values of heater Watts at the ten humidity levels (5%, 15%, 25%, 35%, 45%, 55%, 65%, 75%, 85%, and 95%) used to calculate the variable anti-sweat heater ''Correction Factor''), and whether testing has been conducted with modifications to the standard temperature sensor locations, as specified in section 5.1(g) of appendices A and B to subpart B of 10 CFR part 430, as applicable.

(c) *Rounding requirements for representative values, including certified and rated values.* (1) The represented value of annual energy use must be rounded to the nearest kilowatt hour per year.

(2) The represented value of total refrigerated volume must be rounded to the nearest 0.1 cubic foot.

(3) The represented value of adjusted total volume must be rounded to the nearest 0.1 cubic foot.

(d) *Product category determination.* Each basic model shall be certified according to the appropriate product category as defined in § 430.2 of this chapter based on compartment volumes and compartment temperatures. If one or more compartments could be classified as both a fresh food compartment and a freezer compartment, the model must be certified to each applicable product category based on the operation of the compartment(s) as both fresh food and freezer compartments.

(1) Compartment volume used to determine product category shall be, for each compartment, the mean of the volumes of that specific compartment for the sample of tested units of the basic model, measured according to the provisions in section 4.1 of appendix A of subpart B of part 430 of this chapter for refrigerators and refrigerator-freezers and section 4.1 of appendix B of subpart B of part 430 of this chapter for freezers, or, for each compartment, the volume of that specific compartment calculated for the basic model in accordance with § 429.72(c).

(2) Determination of the compartment temperature ranges shall be based on operation under the conditions specified and using measurement of compartment temperature as specified in appendix A of subpart B of part 430 of this chapter for refrigerators and refrigerator-freezers and appendix B of subpart B of part 430 of this chapter for freezers. The determination of compartment status may require evaluation of a model at the extremes of the range of user-selectable temperature control settings. If the temperature ranges for the same compartment of multiple units of a sample are different, the maximum and minimum compartment temperatures for compartment status determination shall be based on the mean measurements for the units in the sample.

[76 FR 12451, Mar. 7, 2011; 76 FR 24762, May 2, 2011, as amended at 79 FR 22348, Apr. 21, 2014; 81 FR 46789, July 18, 2016; 86 FR 56819, Oct. 12, 2021; 88 FR 7845, Feb. 7, 2023]

EFFECTIVE DATE NOTE: At 81 FR 46789, July 18, 2016, §429.14(c)(2) and (3) were stayed indefinitely.

### § 429.15 Room air conditioners.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of §429.11 are applicable to room air conditioners; and

(2) For each basic model of room air conditioners, a sample of sufficient size shall be randomly selected and tested to ensure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

or,

(B) The upper 97½ percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(ii) Any represented value of the combined energy efficiency ratio (CEER) (determined in §430.23(f)(3) for each unit in the sample) or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

or,

(B) The lower 97½ percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(3) The cooling capacity of a basic model is the mean of the measured cooling capacities for each tested unit of the basic model, as determined in § 430.23(f)(1) of this chapter. Round the cooling capacity value to the nearest hundred.

(4) The electrical power input of a basic model is the mean of the measured electrical power inputs for each tested unit of the basic model, as determined in § 430.23(f)(2) of this chapter. Round the electrical power input to the nearest ten.

(5) Round the value of CEER for a basic model to one decimal place.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to room air conditioners; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The combined energy efficiency ratio in British thermal units per Watt-hour (Btu/Wh)), cooling capacity in British thermal units per hour (Btu/h), and the electrical power input in watts (W).

(3) Pursuant to § 429.12(b)(13), a certification report for a variable-speed room air conditioner basic model must include supplemental information and instructions in PDF format that include—

(i) The mean measured cooling capacity for the units tested at each additional test condition (*i.e.*, respectively, the mean of $Capacity_2$, $Capacity_3$, and $Capacity_4$, each expressed in Btu/h and rounded to the nearest 100 Btu/h, as determined in accordance with section 4.1.2 of appendix F of subpart B of part 430 of this chapter);

(ii) The mean electrical power input at each additional test condition (respectively, the mean of $Power_2$, $Power_3$, and $Power_4$, each expressed in W and rounded to the nearest 10 W, as determined in accordance with section 4.1.2 of appendix F of subpart B of part 430 of this chapter); and

(iii) All additional testing and testing set up instructions (*e.g.*, specific operational or control codes or settings) necessary to operate the basic model under the required conditions specified by the relevant test procedure.

[76 FR 12451, Mar. 7, 2011; 76 FR 24763, May 2, 2011, as amended at 86 FR 16475, Mar. 29, 2021]

### § 429.16 Central air conditioners and central air conditioning heat pumps.

(a) *Determination of Represented Value*—(1) *Required represented values.* Determine the represented values (including SEER, EER, HSPF, SEER2, EER2, HSPF2, $P_{W,OFF}$, cooling capacity, and heating capacity, as applicable) for the individual models/combinations (or ''tested combinations'') specified in the following table.

TABLE 1 TO PARAGRAPH (a)(1)

| Category | Equipment subcategory | Required represented values |
|---|---|---|
| Single-Package Unit ..... | Single-Package Air Conditioner (AC) (including space-constrained).<br>Single-Package Heat Pump (HP) (including space-constrained). | Every individual model distributed in commerce. |

TABLE 1 TO PARAGRAPH (a)(1)—Continued

| Category | Equipment subcategory | Required represented values |
|---|---|---|
| Outdoor Unit and Indoor Unit (Distributed in Commerce by Outdoor Unit Manufacturer (OUM)). | Single-Split-System AC with Single-Stage or Two-Stage Compressor (including Space-Constrained and Small-Duct, High Velocity Systems (SDHV)). | Every individual combination distributed in commerce. Each model of outdoor unit must include a represented value for at least one coil-only individual combination that is distributed in commerce and which is representative of the least efficient combination distributed in commerce with that particular model of outdoor unit. For that particular model of outdoor unit, additional represented values for coil-only and blower-coil individual combinations are allowed, if distributed in commerce. |
| | Single-Split System AC with Other Than Single-Stage or Two-Stage Compressor (including Space-Constrained and SDHV). | Every individual combination distributed in commerce, including all coil-only and blower-coil combinations. |
| | Single-Split-System HP (including Space-Constrained and SDHV). | Every individual combination distributed in commerce. |
| | Multi-Split, Multi-Circuit, or Multi-Head Mini-Split Split System—non-SDHV (including Space-Constrained). | For each model of outdoor unit, at a minimum, a non-ducted ''tested combination.'' For any model of outdoor unit also sold with models of ducted indoor units, a ducted ''tested combination.'' When determining represented values on or after January 1, 2023, the ducted ''tested combination'' must comprise the highest static variety of ducted indoor unit distributed in commerce (*i.e.*, conventional, mid-static, or low-static). Additional representations are allowed, as described in paragraphs (c)(3)(i) and (ii) of this section, respectively. |
| | Multi-Split, Multi-Circuit, or Multi-Head Mini-Split Split System—SDHV. | For each model of outdoor unit, an SDHV ''tested combination.'' Additional representations are allowed, as described in paragraph (c)(3)(iii) of this section. |
| Indoor Unit Only Distributed in Commerce by Independent Coil Manufacturer (ICM). | Single-Split-System Air Conditioner (including Space-Constrained and SDHV). | Every individual combination distributed in commerce. |
| | Single-Split-System Heat Pump (including Space-Constrained and SDHV). | |
| | Multi-Split, Multi-Circuit, or Multi-Head Mini-Split Split System—SDHV. | For a model of indoor unit within each basic model, an SDHV ''tested combination.'' Additional representations are allowed, as described in paragraph (c)(3)(iii) of this section. |
| Outdoor Unit with no Match | | Every model of outdoor unit distributed in commerce (tested with a model of coil-only indoor unit as specified in paragraph (b)(2)(i) of this section). |

(2) $P_{W,OFF}$. If individual models of single-package systems or individual combinations (or ''tested combinations'') of split systems that are otherwise identical are offered with multiple options for off mode-related components, determine the represented value for the individual model/combination with the crankcase heater and controls that are the most consumptive. A manufacturer may also determine represented values for individual models/combinations with less consumptive off mode options; however, all such options must be identified with different model numbers for single-package systems or for outdoor units (in the case of split systems).

(3) *Refrigerants.* (i) If a model of outdoor unit (used in a single-split, multi-split, multi-circuit, multi-head mini-split, and/or outdoor unit with no match system) is distributed in commerce and approved for use with multiple refrigerants, a manufacturer must determine all represented values for that model using each refrigerant that can be used in an individual combination of the basic model (including outdoor units with no match or ''tested combinations''). This requirement may apply across the listed categories in the table in paragraph (a)(1) of this section. A refrigerant is considered approved for use if it is listed on the nameplate of the outdoor unit. If any

of the refrigerants approved for use is HCFC-22 or has a 95 °F midpoint saturation absolute pressure that is ± 18 percent of the 95 °F saturation absolute pressure for HCFC-22, or if there are no refrigerants designated as approved for use, a manufacturer must determine represented values (including SEER, EER, HSPF, SEER2, EER2, HSPF2, $P_{W,OFF}$, cooling capacity, and heating capacity, as applicable) for, at a minimum, an outdoor unit with no match. If a model of outdoor unit is not charged with a specified refrigerant from the point of manufacture or if the unit is shipped requiring the addition of more than two pounds of refrigerant to meet the charge required for testing per section 2.2.5 of appendix M or appendix M1 (unless either (a) the factory charge is equal to or greater than 70% of the outdoor unit internal volume times the liquid density of refrigerant at 95 °F or (b) an A2L refrigerant is approved for use and listed in the certification report), a manufacturer must determine represented values (including SEER, EER, HSPF, SEER2, EER2, HSPF2, $P_{W,OFF}$, cooling capacity, and heating capacity, as applicable) for, at a minimum, an outdoor unit with no match.

(ii) If a model is approved for use with multiple refrigerants, a manufacturer may make multiple separate representations for the performance of that model (all within the same individual combination or outdoor unit with no match) using the multiple approved refrigerants. In the alternative, manufacturers may certify the model (all within the same individual combination or outdoor unit with no match) with a single representation, provided that the represented value is no more efficient than its performance using the least-efficient refrigerant. If a manufacturer certifies a single model with multiple representations for the different approved refrigerants, it may use an AEDM to determine the represented values for all other refrigerants besides the refrigerant used for testing. A single representation made for multiple refrigerants may not include equipment in multiple categories or equipment subcategories listed in the table in paragraph (a)(1) of this section.

(4) *Limitations for represented values of individual combinations.* The following paragraphs explains the limitations for represented values of individual combinations (or ''tested combinations'').

(i) *Regional.* A basic model (model of outdoor unit) may only be certified as compliant with a regional standard if all individual combinations within that basic model meet the regional standard for which it is certified, including the coil-only combination as specified in paragraph (a)(1) of this section, as applicable. A model of outdoor unit that is certified below a regional standard can only be rated and certified as compliant with a regional standard if the model of outdoor unit has a unique model number and has been certified as a different basic model for distribution in each region, where the basic model(s) certified as compliant with a regional standard meet the requirements of the first sentence. An ICM cannot certify an individual combination with a rating that is compliant with a regional standard if the individual combination includes a model of outdoor unit that the OUM has certified with a rating that is not compliant with a regional standard. Conversely, an ICM cannot certify an individual combination with a rating that is not compliant with a regional standard if the individual combination includes a model of outdoor unit that an OUM has certified with a rating that is compliant with a regional standard.

(ii) *Multiple product classes.* Models of outdoor units that are rated and distributed in individual combinations that span multiple product classes must be tested, rated, and certified pursuant to paragraph (a) of this section as compliant with the applicable standard for each product class. This includes multi-split systems, multi-circuit systems, and multi-head mini-split systems with a represented value for a mixed combination including both SDHV and either non-ducted or ducted indoor units.

(5) *Requirements.* All represented values under paragraph (a) of this section must be based on testing in accordance with the requirements in paragraph (b) of this section or the application of an AEDM or other methodology as allowed in paragraph (c) of this section.

(b) *Units tested*—(1) *General*. The general requirements of § 429.11 apply to central air conditioners and heat pumps; and

(2) *Individual model/combination selection for testing*. (i) The table identifies the minimum testing requirements for each basic model that includes multiple individual models/combinations; if a basic model spans multiple categories or subcategories listed in the table, multiple testing requirements apply. For each basic model that includes only one individual model/combination, test that individual model/combination. For single-split-system non-space-constrained air conditioners and heat pumps, when testing is required in accordance with 10 CFR part 430, subpart B, appendix M1, these requirements do not apply until July 1, 2024, provided that the manufacturer is certifying compliance of all basic models using an AEDM in accordance with paragraph (c)(1)(i)(B) of this section and paragraph (e)(2)(i)(A) of § 429.70.

TABLE 2 TO PARAGRAPH (b)(2)(i)

| Category | Equipment subcategory | Must test: | With: |
|---|---|---|---|
| Single-Package Unit. | Single-Package AC (including Space-Constrained). | The individual model with the lowest seasonal energy efficiency ratio (SEER) (when testing in accordance with appendix M to subpart B of 10 CFR part 430) or SEER2 (when testing in accordance with appendix M1 to subpart B of 10 CFR part 430). | N/A. |
| | Single-Package HP (including Space-Constrained). | | |
| Outdoor Unit and Indoor Unit (Distributed in Commerce by OUM). | Single-Split-System AC with Single-Stage or Two-Stage Compressor (including Space-Constrained and Small-Duct, High Velocity Systems (SDHV)). | The model of outdoor unit. | A model of coil-only indoor unit. |
| | Single-Split-System HP with Single-Stage or Two-Stage Compressor (including Space-Constrained and SDHV). | The model of outdoor unit. | A model of indoor unit. |
| | Single-Split System AC or HP with Other Than Single-Stage or Two-Stage Compressor having a non-communicating coil-only individual combination (including Space-Constrained and SDHV). | The model of outdoor unit. | A model of non-communicating coil-only indoor unit. |
| | Single-Split System AC or HP with Other Than Single-Stage or Two-Stage Compressor without a non-communicating coil-only individual combination (including Space-Constrained and SDHV). | The model of outdoor unit. | A model of indoor unit. |

TABLE 2 TO PARAGRAPH (b)(2)(i)—Continued

| Category | Equipment subcategory | Must test: | With: |
|---|---|---|---|
| | Multi-Split, Multi-Circuit, or Multi-Head Mini-Split Split System—non-SDHV (including Space-Constrained). | The model of outdoor unit. | At a minimum, a ''tested combination'' composed entirely of non-ducted indoor units. For any models of outdoor units also sold with models of ducted indoor units, test a second ''tested combination'' composed entirely of ducted indoor units (in addition to the non-ducted combination). If testing under appendix M1 to subpart B of 10 CFR part 430, the ducted ''tested combination'' must comprise the highest static variety of ducted indoor unit distributed in commerce (*i.e.*, conventional, mid-static, or low-static). |
| | Multi-Split, Multi-Circuit, or Multi-Head Mini-Split Split System—SDHV. | The model of outdoor unit. | A ''tested combination'' composed entirely of SDHV indoor units. |
| Indoor Unit Only (Distributed in Commerce by ICM). | Single-Split-System Air Conditioner (including Space-Constrained and SDHV). | A model of indoor unit .... | The least efficient model of outdoor unit with which it will be paired where the least efficient model of outdoor unit is the model of outdoor unit in the lowest SEER combination (when testing under appendix M to subpart B of 10 CFR part 430) or SEER2 combination (when testing under appendix M1 to subpart B of 10 CFR part 430) as certified by the OUM.If there are multiple models of outdoor unit with the same lowest SEER (when testing under appendix M to subpart B of 10 CFR part 430) or SEER2 (when testing under appendix M1 to subpart B of 10 CFR part 430) represented value, the ICM may select one for testing purposes. |
| | Single-Split-System Heat Pump (including Space-Constrained and SDHV). | Nothing, as long as an equivalent air conditioner basic model has been tested If an equivalent air conditioner basic model has not been tested, must test a model of indoor unit. | |

TABLE 2 TO PARAGRAPH (b)(2)(i)—Continued

| Category | Equipment subcategory | Must test: | With: |
|---|---|---|---|
| | Multi-Split, Multi-Circuit, or Multi-Head Mini-Split Split System—SDHV. | A model of indoor unit .... | A ''tested combination'' composed entirely of SDHV indoor units, where the outdoor unit is the least efficient model of outdoor unit with which the SDHV indoor unit will be paired. The least efficient model of outdoor unit is the model of outdoor unit in the lowest SEER combination (when testing under appendix M to subpart B of 10 CFR part 430) or SEER2 combination (when testing under appendix M1 to subpart B of 10 CFR part 430) as certified by the OUM. If there are multiple models of outdoor unit with the same lowest SEER represented value (when testing under appendix M to subpart B of 10 CFR part 430) or SEER2 represented value (when testing under appendix M1 to subpart B of 10 CFR part 430), the ICM may select one for testing purposes. |
| Outdoor Unit with No Match. | ..... | The model of outdoor unit. | A model of coil-only indoor unit meeting the requirements of section 2.2e of appendix M or M1 to subpart B of 10 CFR part 430. |

(ii) Each individual model/combination (or ''tested combination'') identified in paragraph (b)(2)(i) of this section is not required to be tested for $P_{W,OFF}$. Instead, at a minimum, among individual models/combinations with similar off-mode construction (even spanning different models of outdoor units), a manufacturer must test at least one individual model/combination for $P_{W,OFF}$.

(3) *Sampling plans and represented values.* For individual models (for single-package systems) or individual combinations (for split-systems, including ''tested combinations'' for multi-split, multi-circuit, and multi-head mini-split systems) with represented values determined through testing, each individual model/combination (or ''tested combination'') must have a sample of sufficient size tested in accordance with the applicable provisions of this subpart. For heat pumps (other than heating-only heat pumps), all units of the sample population must be tested in both the cooling and heating modes and the results used for determining all representations. The represented values for any individual model/combination must be assigned such that:

(i) *Off-Mode.* Any represented value of power consumption or other measure of energy consumption for which consumers would favor lower values must be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample; Or,

(B) The upper 90 percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.90}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; $s$ is the sample standard deviation; $n$ is the number of samples; and $t_{0.90}$ is the Student's t-Distribution Values for a 90 percent one-tailed confidence interval with n−1 degrees of freedom (from appendix A to this subpart). Round represented values of off-mode power consumption to the nearest watt.

(ii) *SEER, EER, HSPF, SEER2, EER2, and HSPF2.* Any represented value of the energy efficiency or other measure of energy consumption for which consumers would favor higher values shall be less than or equal to the lower of:

(*A*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; $n$ is the number of samples; and $x_i$ is the ith sample; or,

(B) The lower 90 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.90}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; $s$ is the sample standard deviation; $n$ is the number of samples; and $t_{0.90}$ is the Student's t-Distribution Values for a 90 percent one-tailed confidence interval with n−1 degrees of freedom (from appendix A to this subpart). Round represented values of EER, SEER, HSPF, EER2, SEER2, and HSPF2 to the nearest 0.05.

(iii) *Cooling Capacity and Heating Capacity.* The represented values of cooling capacity and heating capacity must each be a self-declared value that is:

(A) Less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; $n$ is the number of samples; and $x_i$ is the ith sample; or,

(*2*) The lower 90 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.90}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; $s$ is the sample standard deviation; $n$ is the number of samples; and $t_{0.90}$ is the Student's t-Distribution Values for a 90 percent one-tailed confidence interval with n−1 degrees of freedom (from appendix A to this subpart).

(B) Rounded according to:

(*1*) To the nearest 100 Btu/h if cooling capacity or heating capacity is less than 20,000 Btu/h,

(*2*) To the nearest 200 Btu/h if cooling capacity or heating capacity is greater than or equal to 20,000 Btu/h but less than 38,000 Btu/h, and

(*3*) To the nearest 500 Btu/h if cooling capacity or heating capacity is greater than or equal to 38,000 Btu/h and less than 65,000 Btu/h.

(c) *Determination of represented values for all other individual models/combinations besides those specified in paragraph (b)(2) of this section*—(1) *All basic models except outdoor units with no match and multi-split systems, multi-circuit systems, and multi-head mini-split systems.* (i) For every individual model/combination within a basic model other than the individual model/combination required to be tested pursuant to paragraph (b)(2) of this section, either—

(A) A sample of sufficient size, comprised of production units or representing production units, must be tested as complete systems with the resulting represented values for the individual model/combination obtained in accordance with paragraphs (b)(1) and (3) of this section; or

(B) The represented values of the measures of energy efficiency or energy consumption through the application of an AEDM in accordance with paragraph (d) of this section and § 429.70. An AEDM may only be used to determine represented values for individual models or combinations in a basic model (or separate approved refrigerants within an individual combination) other than the individual model or combination(s) required for mandatory testing under paragraph (b)(2) of this section, except that, for single-split, non-space-constrained systems, when testing is required in accordance with 10 CFR part 430, subpart B, appendix M1, an AEDM may be used to rate the individual model or combination(s) required for mandatory testing under paragraph (b)(2) of this section until July 1, 2024, in accordance with paragraph (e)(2)(i)(A) of § 429.70.

(ii) For every individual model/combination within a basic model tested pursuant to paragraph (b)(2) of this section, but for which $P_{W,OFF}$ testing was not conducted, the represented value of $P_{W,OFF}$ may be assigned through, either:

(A) The testing result from an individual model/combination of similar off-mode construction, or

(B) The application of an AEDM in accordance with paragraph (d) of this section and § 429.70.

(2) *Outdoor units with no match.* All models of outdoor units with no match within a basic model must be tested. No model of outdoor unit with no match may be rated with an AEDM,

other than to determine the represented values for models using approved refrigerants other than the one used in testing.

(3) *For multi-split systems, multi-circuit systems, and multi-head mini-split systems.* The following applies:

(i) When testing in accordance with 10 CFR part 430, subpart B, appendix M1, for basic models that include additional varieties of ducted indoor units (*i.e.*, conventional, low-static, or mid-static) other than the one for which representation is required in paragraph (a)(1) of this section, if a manufacturer chooses to make a representation, the manufacturer must conduct testing of a tested combination according to the requirements in paragraph (b)(3) of this section.

(ii) When testing in accordance with 10 CFR part 430, subpart B, appendix M, for basic models composed of both non-ducted and ducted combinations, the represented value for the mixed non-ducted/ducted combination is the mean of the represented values for the non-ducted and ducted combinations as determined in accordance with paragraph (b)(3) of this section. When testing in accordance with 10 CFR part 430, subpart B, appendix M1, for basic models that include mixed combinations of indoor units (any two kinds of non-ducted, low-static, mid-static, and conventional ducted indoor units), the represented value for the mixed combination is the mean of the represented values for the individual component combinations as determined in accordance with paragraph (b)(3) of this section.

(iii) When testing in accordance with 10 CFR part 430, subpart B, appendix M, for basic models composed of both SDHV and non-ducted or ducted combinations, the represented value for the mixed SDHV/non-ducted or SDHV/ducted combination is the mean of the represented values for the SDHV, non-ducted, or ducted combinations, as applicable, as determined in accordance with paragraph (b)(3) of this section. When testing in accordance with 10 CFR part 430, subpart B, appendix M1, for basic models including mixed combinations of SDHV and another kind of indoor unit (any of non-ducted, low-static, mid-static, and conventional ducted), the represented value for the mixed SDHV/other combination is the mean of the represented values for the SDHV and other tested combination as determined in accordance with paragraph (b)(3) of this section.

(iv) All other individual combinations of models of indoor units for the same model of outdoor unit for which the manufacturer chooses to make representations must be rated as separate basic models, and the provisions of paragraphs (b)(1) through (3) and (c)(3)(i) through (iii) of this section apply.

(v) With respect to $P_{W,OFF}$ only, for every individual combination (or ''tested combination'') within a basic model tested pursuant to paragraph (b)(2) of this section, but for which $P_{W,OFF}$ testing was not conducted, the representative values of $P_{W,OFF}$ may be assigned through either:

(A) The testing result from an individual model or combination of similar off-mode construction, or

(B) Application of an AEDM in accordance with paragraph (d) of this section and § 429.70.

(d) *Alternative efficiency determination methods.* In lieu of testing, represented values of efficiency or consumption may be determined through the application of an AEDM pursuant to the requirements of § 429.70(e) and the provisions of this section.

(1) *Power or energy consumption.* Any represented value of the average off mode power consumption or other measure of energy consumption of an individual model/combination for which consumers would favor lower values must be greater than or equal to the output of the AEDM but no greater than the standard.

(2) *Energy efficiency.* Any represented value of the SEER, EER, HSPF, SEER2, EER2, HSPF2 or other measure of energy efficiency of an individual model/combination for which consumers would favor higher values must be less than or equal to the output of the AEDM but no less than the standard.

(3) *Cooling capacity.* The represented value of cooling capacity of an individual model/combination must be no greater than the cooling capacity output simulated by the AEDM.

(4) *Heating capacity*. The represented value of heating capacity of an individual model/combination must be no greater than the heating capacity output simulated by the AEDM.

(e) *Certification reports*. This paragraph specifies the information that must be included in a certification report.

(1) *General*. The requirements of § 429.12 apply to central air conditioners and heat pumps.

(2) *Public product-specific information*. Pursuant to § 429.12(b)(13), for each individual model (for single-package systems) or individual combination (for split-systems, including outdoor units with no match and ''tested combinations'' for multi-split, multi-circuit, and multi-head mini-split systems), a certification report must include the following public product-specific information: When certifying compliance with January 1, 2015, energy conservation standards, the seasonal energy efficiency ratio (SEER in British thermal units per Watt-hour (Btu/W-h)) or when certifying compliance with January 1, 2023, energy conservation standards, seasonal energy efficiency ratio 2 (SEER2 in British thermal units per Watt-hour (Btu/W-h)); the average off mode power consumption ($P_{W,OFF}$ in Watts); the cooling capacity in British thermal units per hour (Btu/h); the region(s) in which the basic model can be sold; when certifying compliance with January 1, 2023, energy conservation standards, the kind(s) of air conditioner or heat pump associated with the minimum external static pressure used in testing or rating (ceiling-mount, wall-mount, mobile home, low-static, mid-static, small duct high velocity, space-constrained, or conventional/not otherwise listed); and

(i) For heat pumps, when certifying compliance with January 1, 2015, energy conservation standards, the heating seasonal performance factor (HSPF in British thermal units per Watt-hour (Btu/W-h)) or, when certifying compliance with January 1, 2023, energy conservation standards, heating seasonal performance factor 2 (HSPF2 in British thermal units per Watt-hour (Btu/W-h));

(ii) For central air conditioners (excluding space-constrained products), when certifying compliance with January 1, 2015, energy conservation standards, the energy efficiency ratio (EER in British thermal units per Watt-hour (Btu/W-h)) from the A or $A_2$ test, whichever applies, or when certifying compliance with January 1, 2023, energy conservation standards, the energy efficiency ratio 2 (EER2 in Btu/W-h);

(iii) For single-split-systems, whether the represented value is for a coil-only or blower coil system;

(iv) For multi-split, multiple-circuit, and multi-head mini-split systems (including VRF and SDHV), when certifying compliance with January 1, 2015, energy conservation standards, whether the represented value is for a non-ducted, ducted, mixed non-ducted/ducted system, SDHV, mixed non-ducted/SDHV system, or mixed ducted/SDHV system;

(v) For all split systems including outdoor units with no match, the refrigerant; and

(vi) For variable-speed coil only systems; whether the represented value is based on a non-communicating or communicating control system.

(3) *Basic and individual model numbers*. The basic model number and individual model number(s) required to be reported under § 429.12(b)(6) must consist of the following:

| Equipment type | Basic model number | Individual model number(s) | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Single-Package (including Space-Constrained). | Number unique to the basic model. | Package | N/A | N/A. |
| Single-Split System (including Space-Constrained and SDHV). | Number unique to the basic model. | Outdoor Unit | Indoor Unit | If applicable—Air Mover (could be same as indoor unit if fan is part of indoor unit model number). |

| Equipment type | Basic model number | Individual model number(s) | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Multi-Split, Multi-Circuit, and Multi-Head Mini-Split System (including Space-Constrained and SDHV). | Number unique to the basic model. | Outdoor Unit ..... | When certifying a basic model based on tested combination(s): * * *. When certifying an individual combination: Indoor Unit(s). | If applicable—When certifying a basic model based on tested combination(s): * * *. When certifying an individual combination: Air Mover(s). |
| Outdoor Unit with No Match. | Number unique to the basic model. | Outdoor Unit ..... | N/A ..... | N/A. |

(4) *Additional product-specific information.* Pursuant to § 429.12(b)(13), for each individual model/combination (including outdoor units with no match and ''tested combinations''), a certification report must include the following additional product-specific information: The cooling full load air volume rate for the system or for each indoor unit as applicable (in cubic feet per minute of standard air (scfm)); the air volume rates that represent normal operation for other test conditions including minimum cooling air volume rate, intermediate cooling air volume rate, full load heating air volume rate, minimum heating air volume rate, intermediate heating air volume rate, and nominal heating air volume rate (scfm) for the system or for each indoor unit as applicable, if different from the cooling full load air volume rate; whether the individual model uses a fixed orifice, thermostatic expansion valve, electronic expansion valve, or other type of metering device; the duration of the compressor break-in period, if used; whether the optional tests were conducted to determine the $C_D{}^c$ value used to represent cooling mode cycling losses or whether the default value was used; the temperature at which the crankcase heater with controls is designed to turn on, if applicable; whether an inlet plenum was installed during testing; the duration of the indoor fan time delay, if used; and

(i) For heat pumps, whether the optional tests were conducted to determine the $C_D{}^h$ value or whether the default value was used; and the maximum time between defrosts as allowed by the controls (in hours);

(ii) For multi-split, multiple-circuit, and multi-head mini-split systems, the number of indoor units tested with the outdoor unit; the nominal cooling capacity of each indoor unit and outdoor unit in the combination; and the indoor units that are not providing heating or cooling for part-load tests;

(iii) For ducted systems having multiple indoor fans within a single indoor unit, the number of indoor fans; the nominal cooling capacity of the indoor unit and outdoor unit; which fan(s) operate to attain the full-load air volume rate when controls limit the simultaneous operation of all fans within the single indoor unit; and the allocation of the full-load air volume rate to each operational fan when different capacity blowers are connected to the common duct;

(iv) For blower coil systems, the airflow-control settings associated with full load cooling operation; the airflow-control settings or alternative instructions for setting fan speed to the speed upon which the rating is based; and whether the system varies blower speeds with outdoor air conditions;

(v) For models with time-adaptive defrost control, the frosting interval to be used during Frost Accumulation tests and the procedure for manually initiating the defrost at the specified time;

(vi) For models of indoor units designed for both horizontal and vertical installation or for both up-flow and down-flow vertical installations, the orientation used for testing;

(vii) For variable-speed models, the compressor frequency set points, and the required dip switch/control settings for step or variable components;

(viii) For variable-speed heat pumps, whether the $H1_N$ or $H1_2$ test speed is the same as the $H3_2$ test speed; the compressor frequency that corresponds to maximum speed at which the system

controls would operate the compressor in normal operation in a 17 °F ambient temperature; and when certifying compliance with January 1, 2023, energy conservation standards, whether the optional 5 °F very low temperature heating mode test was used to characterize performance at temperatures below 17 °F (except for triple-capacity northern heat pumps, for which the very low temperature test is required,) and whether the alternative test required for minimum-speed-limiting variable-speed heat pumps was used;

(ix) For models of outdoor units with no match, the following characteristics of the indoor coil: The face area, the coil depth in the direction of airflow, the fin density (fins per inch), the fin material, the fin style, the tube diameter, the tube material, and the numbers of tubes high and deep; and

(x) For central air conditioners and heat pumps that have two-capacity compressors that lock out low capacity operation for cooling at higher outdoor temperatures and/or heating at lower outdoor temperatures, the outdoor temperature(s) at which the unit locks out low capacity operation.

(f) *Represented values for the Federal Trade Commission*. Use the following represented value determinations to meet the requirements of the Federal Trade Commission.

(1) *Annual Operating Cost—Cooling*. Determine the represented value of estimated annual operating cost for cooling-only units or the cooling portion of the estimated annual operating cost for air-source heat pumps that provide both heating and cooling by calculating the product of:

(i) The value determined in paragraph (f)(1)(i)(A) of this section if using appendix M to subpart B of part 430 or the value determined in paragraph (f)(1)(i)(B) of this section if using appendix M1 to subpart B of part 430;

(A) The quotient of the represented value of cooling capacity, in Btu's per hour as determined in paragraph (b)(3)(iii) of this section, divided by the represented value of SEER, in Btu's per watt-hour, as determined in paragraph (b)(3)(ii) of this section;

(B) The quotient of the represented value of cooling capacity, in Btu's per hour as determined in paragraph (b)(3)(iii) of this section, and multiplied by 0.93 for variable-speed heat pumps only, divided by the represented value of SEER2, in Btu's per watt-hour, as determined in paragraph (b)(3)(ii) of this section.

(ii) The representative average use cycle for cooling of 1,000 hours per year;

(iii) A conversion factor of 0.001 kilowatt per watt; and

(iv) The representative average unit cost of electricity in dollars per kilowatt-hour as provided pursuant to section 323(b)(2) of the Act.

(2) *Annual Operating Cost—Heating*. Determine the represented value of estimated annual operating cost for air-source heat pumps that provide only heating or for the heating portion of the estimated annual operating cost for air-source heat pumps that provide both heating and cooling, as follows:

(i) When using appendix M to subpart B of part 430, the product of:

(A) The quotient of the mean of the standardized design heating requirement for the sample, in Btu's per hour, nearest to the Region IV minimum design heating requirement, determined for each unit in the sample in section 4.2 of appendix M to subpart B of part 430, divided by the represented value of heating seasonal performance factor (HSPF), in Btu's per watt-hour, calculated for Region IV corresponding to the above-mentioned standardized design heating requirement, as determined in paragraph (b)(3)(ii) of this section;

(B) The representative average use cycle for heating of 2,080 hours per year;

(C) The adjustment factor of 0.77, which serves to adjust the calculated design heating requirement and heating load hours to the actual load experienced by a heating system;

(D) A conversion factor of 0.001 kilowatt per watt; and

(E) The representative average unit cost of electricity in dollars per kilowatt-hour as provided pursuant to section 323(b)(2) of the Act;

(ii) When using appendix M1 to subpart B of part 430, the product of:

(A) The quotient of the represented value of cooling capacity (for air-source heat pumps that provide both

cooling and heating) in Btu's per hour, as determined in paragraph (b)(3)(iii) of this section, or the represented value of heating capacity (for air-source heat pumps that provide only heating), as determined in paragraph (b)(3)(i)(D) of this section, divided by the represented value of heating seasonal performance factor 2 (HSPF2), in Btu's per watt-hour, calculated for Region IV, as determined in paragraph (b)(3)(ii) of this section;

(B) The representative average use cycle for heating of 1,572 hours per year;

(C) The adjustment factor of 1.15 (for heat pumps that are not variable-speed) or 1.07 (for heat pumps that are variable-speed), which serves to adjust the calculated design heating requirement and heating load hours to the actual load experienced by a heating system;

(D) A conversion factor of 0.001 kilowatt per watt; and

(E) The representative average unit cost of electricity in dollars per kilowatt-hour as provided pursuant to section 323(b)(2) of the Act;

(3) *Annual Operating Cost—Total.* Determine the represented value of estimated annual operating cost for air-source heat pumps that provide both heating and cooling by calculating the sum of the quantity determined in paragraph (f)(1) of this section added to the quantity determined in paragraph (f)(2) of this section.

(4) *Regional Annual Operating Cost—Cooling.* Determine the represented value of estimated regional annual operating cost for cooling-only units or the cooling portion of the estimated regional annual operating cost for air-source heat pumps that provide both heating and cooling by calculating the product of:

(i) The value determined in paragraph (f)(4)(i)(A) of this section if using appendix M to subpart B of part 430 or the value determined in paragraph (f)(4)(i)(B) of this section if using appendix M1 to subpart B of part 430;

(A) The quotient of the represented value of cooling capacity, in Btu's per hour as determined in paragraph (b)(3)(iii) of this section, divided by the represented value of SEER, in Btu's per watt-hour, as determined in paragraph (b)(3)(ii) of this section;

(B) The quotient of the represented value of cooling capacity, in Btu's per hour as determined in paragraph (b)(3)(iii) of this section, and multiplied by 0.93 for variable-speed heat pumps only, divided by the represented value of SEER2, in Btu's per watt-hour, as determined in paragraph (b)(3)(ii) of this section;

(ii) The value determined in paragraph (f)(4)(ii)(A) of this section if using appendix M to subpart B of part 430 or the value determined in paragraph (f)(4)(ii)(B) of this section if using appendix M1 to subpart B of part 430;

(A) The estimated number of regional cooling load hours per year determined from Table 22 in section 4.4 of appendix M to subpart B of part 430;

(B) The estimated number of regional cooling load hours per year determined from Table 21 in section 4.4 of appendix M1 to subpart B of part 430;

(iii) A conversion factor of 0.001 kilowatts per watt; and

(iv) The representative average unit cost of electricity in dollars per kilowatt-hour as provided pursuant to section 323(b)(2) of the Act.

(5) *Regional Annual Operating Cost—Heating.* Determine the represented value of estimated regional annual operating cost for air-source heat pumps that provide only heating or for the heating portion of the estimated regional annual operating cost for air-source heat pumps that provide both heating and cooling as follows:

(i) When using appendix M to subpart B of part 430, the product of:

(A) The estimated number of regional heating load hours per year determined from Table 22 in section 4.4 of appendix M to subpart B of part 430;

(B) The quotient of the mean of the standardized design heating requirement for the sample, in Btu's per hour, for the appropriate generalized climatic region of interest (*i.e.*, corresponding to the regional heating load hours from ''A'') and determined for each unit in the sample in section 4.2 of appendix M to subpart B of part 430, divided by the represented value of HSPF, in Btu's per watt-hour, calculated for the appropriate generalized

climatic region of interest and corresponding to the above-mentioned standardized design heating requirement, and determined in paragraph (b)(3)(ii);

(C) The adjustment factor of 0.77; which serves to adjust the calculated design heating requirement and heating load hours to the actual load experienced by a heating system;

(D) A conversion factor of 0.001 kilowatts per watt; and

(E) The representative average unit cost of electricity in dollars per kilowatt-hour as provided pursuant to section 323(b)(2) of the Act.

(ii) When using appendix M1 to subpart B of part 430, the product of:

(A) The estimated number of regional heating load hours per year determined from Table 21 in section 4.4 of appendix M1 to subpart B of part 430;

(B) The quotient of the represented value of cooling capacity (for air-source heat pumps that provide both cooling and heating) in Btu's per hour, as determined in paragraph (b)(3)(i)(C) of this section, or the represented value of heating capacity (for air-source heat pumps that provide only heating), as determined in paragraph (b)(3)(i)(D) of this section, divided by the represented value of HSPF2, in Btu's per watt-hour, calculated for the appropriate generalized climatic region of interest, and determined in paragraph (b)(3)(i)(B) of this section;

(C) The adjustment factor of 1.15 (for heat pumps that are not variable-speed) or 1.07 (for heat pumps that are variable-speed), which serves to adjust the calculated design heating requirement and heating load hours to the actual load experienced by a heating system;

(D) A conversion factor of 0.001 kilowatts per watt; and

(E) The representative average unit cost of electricity in dollars per kilowatt-hour as provided pursuant to section 323(b)(2) of the Act.

(6) *Regional Annual Operating Cost—Total.* For air-source heat pumps that provide both heating and cooling, the estimated regional annual operating cost is the sum of the quantity determined in paragraph (f)(4) of this section added to the quantity determined in paragraph (f)(5) of this section.

(7) *Annual Operating Cost—Rounding.* Round any represented values of estimated annual operating cost determined in paragraphs (f)(1) through (6) of this section to the nearest dollar per year.

[81 FR 37049, June 8, 2016, as amended at 81 FR 55112, Aug. 18, 2016; 82 FR 1468, Jan. 5, 2017; 86 FR 68393, Dec. 2, 2021; 87 FR 64583, Oct. 25, 2022; 89 FR 82060, Oct. 9, 2024]

### § 429.17 Water heaters.

NOTE 1 TO § 429.17: Prior to February 17, 2023, certification reports must be submitted as required either in this section or 10 CFR 429.17 as it appears in the 10 CFR parts 200 through 499 edition revised as of January 1, 2022. On or after February 17, 2023, certification reports must be submitted as required in this section.

(a) *Determination of represented value.* (1) Manufacturers must determine the represented value for each water heater by applying an AEDM in accordance with 10 CFR 429.70 or by testing for the uniform energy factor, in conjunction with the applicable sampling provisions as follows:

(i) If the represented value is determined through testing, the general requirements of 10 CFR 429.11 are applicable; and

(ii) For each basic model selected for testing, a sample of sufficient size shall be randomly selected and tested to ensure that—

(A) Any represented value of the estimated annual operating cost or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the ith sample;

Or,

(*2*) The upper 95-percent confidence limit (UCL) of the true mean divided by 1.10, where:

$$UCL = \bar{x} + t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95-percent one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(B) Any represented value of the uniform energy factor, or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $x$ is the sample mean; n is the number of samples; and $x_i$ is the ith sample;

Or,

(*2*) The lower 95-percent confidence limit (LCL) of the true mean divided by 0.90, where:

$$LCL = \bar{x} - t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95-percent one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(C) Any represented value of the rated storage volume must be equal to the mean of the measured storage volumes of all the units within the sample. Any represented value of the effective storage volume must be equal to the mean of the effective storage volumes of all the units within the sample.

(D) Any represented value of first-hour rating or maximum gallons per minute (GPM) must be equal to the mean of the measured first-hour ratings or measured maximum GPM ratings, respectively, of all the units within the sample.

(E) For an electric storage water heater that has a permanent mode or setting in which it is capable of heating and storing water above 135 °F, where permanent mode or setting means a mode of operation that is continuous and does not require any external consumer intervention to maintain for longer than 120 hours, except for those that meet the definition of ''heat pump-type'' water heater at §430.2 of this chapter, whose rated storage volumes are less than 20 gallons or greater than 55 gallons, or that are only capable of heating the stored water above

135 °F in response to instructions received from a utility or third-party demand-response program, the following applies:

(*1*) To demonstrate compliance with the energy conservation standards in § 430.32(d)(1) of this chapter, any represented value of uniform energy factor shall be determined based on testing in accordance with section 5.1.1 of appendix E to subpart B of 10 CFR part 430.

(*2*) To demonstrate compliance with the energy conservation standards in § 430.32(d)(2) of this chapter, any represented value of uniform energy factor shall be determined based on high temperature testing in accordance with section 5.1.2 of appendix E to subpart B of 10 CFR part 430.

(b) *Certification reports.* (1) The requirements of 10 CFR 429.12 are applicable to water heaters; and

(2) Pursuant to 10 CFR 429.12(b)(13), a certification report shall include the following public, product-specific information:

(i) For storage-type water heater basic models: The uniform energy factor (UEF, rounded to the nearest 0.01), the rated storage volume in gallons (rounded to the nearest 1 gal), the first-hour rating in gallons (gal, rounded to the nearest 1 gal), and the recovery efficiency in percent (%, rounded to the nearest 1%);

(ii) For instantaneous-type water heater basic models: The uniform energy factor (UEF, rounded to the nearest 0.01), the rated storage volume in gallons (gal, rounded to the nearest 1 gal), the maximum gallons per minute (gpm, rounded to the nearest 0.1 gpm), and the recovery efficiency in percent (%, rounded to the nearest 1%); and

(iii) For grid-enabled water heater basic models: The uniform energy factor (UEF, rounded to the nearest 0.01), the rated storage volume in gallons (gal, rounded to the nearest 1 gal), the first-hour rating in gallons (gal, rounded to the nearest 1 gal), the recovery efficiency in percent (%, rounded to the nearest 1%), a declaration that the model is a grid-enabled water heater, whether it is equipped at the point of manufacture with an activation lock, and whether it bears a permanent label applied by the manufacturer that advises purchasers and end-users of the intended and appropriate use of the product.

(c) *Reporting of annual shipments for grid-enabled water heaters.* Pursuant to 42 U.S.C. 6295(e)(6)(C)(i), manufacturers of grid-enabled water heaters must report the total number of grid-enabled water heater units shipped for sale in the U.S. by the manufacturer for the previous calendar year (*i.e.*, January 1st through December 31st), as well as the calendar year that the shipments cover, starting on or before May 1, 2023, and annually on or before May 1 each year thereafter. This information shall be reported separately from the certification report required under paragraph (b)(2) of this section, and must be submitted to DOE in accordance with the submission procedures set forth in § 429.12(h). DOE will consider the annual reported shipments to be confidential business information without the need for the manufacturer to request confidential treatment of the information pursuant to § 429.7(c).

[81 FR 96235, Dec. 29, 2016, as amended at 87 FR 43977, July 22, 2022; 89 FR 37941 May 6, 2024]

### § 429.18 Consumer furnaces.

NOTE 1 TO § 429.18: Prior to February 17, 2023, certification reports must be submitted as required either in this section or 10 CFR 429.18 as it appears in the 10 CFR parts 200 through 499 edition revised as of January 1, 2022. On or after February 17, 2023, certification reports must be submitted as required in this section.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to residential furnaces; and

(2)(i) For each basic model of furnaces, other than basic models of those sectional cast-iron boilers (which may be aggregated into groups having identical intermediate sections and combustion chambers) a sample of sufficient size shall be randomly selected and tested to ensure that—

(A) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(*2*) The upper 97½ percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(B) Any represented value of the annual fuel utilization efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(*2*) The lower 97½ percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(ii) For the lowest capacity basic model of a group of basic models of those sectional cast-iron boilers having identical intermediate sections and combustion chambers, a sample of sufficient size shall be randomly selected and tested to ensure that—

(A) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for

which consumers would favor lower values shall be greater than or equal to the higher of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(*2*) The upper 97½ percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(B) Any represented value of the fuel utilization efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(*2*) The lower 97½ percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(iii) For the highest capacity basic model of a group of basic models of those sectional cast-iron boilers having identical intermediate sections and combustion chambers, a sample of sufficient size shall be randomly selected and tested to ensure that—

(A) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(*2*) The upper 97½ percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(B) Any represented value of the fuel utilization efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(*2*) The lower 97½ percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(iv) For each basic model or capacity other than the highest or lowest of the group of basic models of sectional cast-iron boilers having identical intermediate sections and combustion chambers, represented values of measures of energy consumption shall be determined by either—

(A) A linear interpolation of data obtained for the smallest and largest capacity units of the family, or

(B) Testing a sample of sufficient size to ensure that:

(*1*) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(*i*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(*ii*) The upper 97½ percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(*2*) Any represented value of the energy factor or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(*i*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(*ii*) The lower 97½ percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(v) Whenever measures of energy consumption determined by linear interpolation do not agree with measures of energy consumption determined by actual testing, the values determined by testing must be used for certification.

(vi) In calculating the measures of energy consumption for each unit tested, use the design heating requirement corresponding to the mean of the capacities of the units of the sample.

(vii) The represented value of annual fuel utilization efficiency must be rounded to the nearest one-tenth of a percentage point. The represented values of standby mode power and off mode power must be rounded to the nearest one-tenth of a watt.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to residential furnaces; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information:

(i) For consumer furnaces and boilers: The annual fuel utilization efficiency (AFUE) in percent (%) and the input capacity in British thermal units per hour (Btu/h).

(ii) For non-weatherized oil-fired furnaces (including mobile home furnaces), electric furnaces, and boilers: The standby mode power consumption ($P_{W,SB}$) and off mode power consumption ($P_{W,OFF}$) in watts.

(3) Pursuant to § 429.12(b)(13), a certification report shall include the following additional product-specific information:

(i) For cast-iron sectional boilers: A declaration of whether certification is based on linear interpolation or testing.

(ii) For gas-fired hot water boilers and gas-fired steam boilers: A declaration that the manufacturer has not incorporated a constant-burning pilot.

(iii) For gas-fired hot water boilers, oil-fired hot water boilers, and electric hot water boilers: Whether the boiler is equipped with tankless domestic water heating coils, and if not, a declaration that the manufacturer has incorporated an automatic means for adjusting water temperature).

(4) For multi-position furnaces, the annual fuel utilization efficiency (AFUE) reported for each basic model must be based on testing in the least efficient configuration. Manufacturers may also report and make representations of additional AFUE values based on testing in other configurations.

[76 FR 12451, Mar. 7, 2011; 76 FR 24765, May 2, 2011, as amended at 76 FR 38292, June 30, 2011; 81 FR 2646, Jan. 15, 2016; 87 FR 43977, July 22, 2022]

### § 429.19 Dishwashers.

NOTE 1 TO § 429.19: Prior to February 17, 2023, certification reports must be submitted as required either in this section or 10 CFR 429.19 as it appears in the 10 CFR parts 200 through 499 edition revised as of January 1, 2022. On or after February 17, 2023, certification reports must be submitted as required in this section.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to dishwashers; and

(2) For each basic model of dishwashers, a sample of sufficient size shall be randomly selected and tested to ensure that—

(i) Any represented value of estimated annual operating cost, energy or water consumption or other measure of energy or water consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The upper 97½ percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(ii) Any represented value of the energy or water factor or other measure of energy or water consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The lower 97½ percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to dishwashers; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The estimated annual energy use in kilowatt hours per year (kWh/yr), the water consumption in gallons per cycle, and the capacity in number of place settings.

(3) Pursuant to § 429.12(b)(13), a certification report shall include the following additional product-specific information—

(i) The presence of a soil sensor, and if yes, the number of cycles required to reach calibration;

(ii) The water inlet temperature used for testing in degrees Fahrenheit ( °F);

(iii) The cycle selected for the energy test and whether that cycle is soil-sensing if testing is performed using appendix C1 to subpart B of part 430 of this chapter and the cycles selected for the sensor heavy response, sensor medium response, and sensor light response and whether these cycles are soil-sensing if testing is performed using appendix C2 to subpart B of part 430 of this chapter;

(iv) The options selected for the energy test if testing is performed using appendix C1 to subpart B of part 430 of this chapter and the options selected for the sensor heavy response, sensor medium response, and sensor light response if testing is performed using appendix C2 to subpart B of part 430 of this chapter;

(v) The average cleaning index for the sensor heavy response, sensor medium response, and sensor light response cycles if testing is performed using appendix C2 to subpart B of part 430 of this chapter (*see* section 5.1 of appendix C2 for the calculation of per-cycle cleaning index for each test cycle);

(vi) Indication of whether Cascade Complete Powder or Cascade with the Grease Fighting Power of Dawn was used as the detergent formulation. When certifying dishwashers, other than water re-use dishwashers, according to appendix C1 to subpart B of part 430 of this chapter:

(A) Before July 17, 2023, Cascade Complete Powder detergent may be used as the basis for certification in conjunction with the detergent dosing methods specified in either section 2.5.2.1.1 or section 2.5.2.1.2 of appendix C1. Cascade with the Grease Fighting Power of Dawn detergent may be used as the basis for certification only in conjunction with the detergent dosing specified in section 2.5.2.1.1 of appendix C1.

(B) Beginning July 17, 2023, Cascade Complete Powder detergent may be used as the basis for certification of newly certified basic models only in conjunction with the detergent dosing method specified in section 2.5.2.1.2 of appendix C1. Cascade with the Grease Fighting Power of Dawn detergent may be used as the basis for certification only in conjunction with the detergent dosing specified in section 2.5.2.1.1 of appendix C1. Manufacturers may maintain existing basic model certifications made prior to July 17, 2023, consistent with the provisions of paragraph (b)(3)(vi)(A) of this section.

(vii) The presence of a built-in water softening system, and if yes, the energy use in kilowatt hours and the water use in gallons required for each regeneration of the water softening system, the number of regeneration cycles per year, and data and calculations used to derive these values;

(viii) Whether the product is a water re-use system dishwasher, and if yes, the energy use in kilowatt hours and water use in gallons required for a drain out event, the energy use in kilowatt hours and water use in gallons required for a clean out event, the number of drain out events per year, the number of clean out events per year, the water fill volume to calculate detergent dosage in gallons, and data and calculations used to derive these values, as applicable; and

(ix) The presence of a built-in reservoir, and if yes, the manufacturer-stated reservoir capacity in gallons, the prewash fill water volume in gallons and the main wash fill water volume in gallons if testing is performed using appendix C1 to subpart B of part 430 of this chapter, and the reservoir water consumption in gallons per cycle.

(c) *Reported values.* Values reported pursuant to this subsection must be rounded as follows:

(1) The represented value of estimated annual energy use to the nearest kilowatt hour per year.

(2) The represented value of water consumption to the nearest 0.1 gallon per cycle.

[76 FR 12451, Mar. 7, 2011; 76 FR 24766, May 2, 2011, as amended at 77 FR 31962, May 30, 2012; 77 FR 65977, Oct. 31, 2012; 81 FR 90118, Dec. 13, 2016; 87 FR 43977, July 22, 2022; 88 FR 48357, July 27, 2023; 89 FR 82061, Oct. 9, 2024]

### § 429.20 Residential clothes washers.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to residential clothes washers; and

(2) For each basic model of residential clothes washers, a sample of sufficient size shall be randomly selected and tested to ensure that—

(i) Any represented value of the integrated water factor, the estimated annual operating cost, the energy or water consumption, or other measure of energy or water consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The upper 97½ percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(ii) Any represented value of the integrated modified energy factor, energy efficiency ratio, water efficiency ratio, or other measure of energy or water consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The lower 97½ percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(3) The clothes container capacity of a basic model reported in accordance with paragraph (b)(2) of this section shall be the mean of the measured clothes container capacity, C, of all tested units of the basic model.

(4) The remaining moisture content (RMC) of a basic model reported in accordance with paragraph (b)(2) of this section shall be the mean of the final RMC value measured for all tested units of the basic model.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to residential clothes washers; and

(2) Pursuant to § 429.12(b)(13), a certification report shall contain the following public product-specific information:

(i) For residential clothes washers tested in accordance with appendix J to subpart B of part 430 of this chapter: the energy efficiency ratio (EER) in pounds per kilowatt hour per cycle (lb/kWh/cycle), the water efficiency ratio (WER) in pounds per gallon per cycle (lb/gal/cycle), the clothes container capacity in cubic feet (cu ft), the corrected remaining moisture content (RMC) expressed as a percentage, the type of control system (automatic or semi-automatic), and the type of loading (top-loading or front-loading).

(ii) For residential clothes washers tested in accordance with appendix J2 to subpart B of part 430 of this chapter: the integrated modified energy factor (IMEF) in cu ft/kWh/cycle, the integrated water factor (IWF) in gal/cycle/cu ft, the clothes container capacity in cu ft, the corrected RMC expressed as a percentage, and the type of loading (top-loading or front-loading).

(3) Pursuant to 10 CFR 429.12(b)(13), a certification report must include the following additional product-specific information: a list of all cycle selections comprising the complete energy test cycle for each basic model and the test cloth lot number used for certification testing.

(c) *Reported values.* Values reported pursuant to this subsection must be rounded as follows:

(1) MEF and IMEF to the nearest 0.01 cu ft/kWh/cycle;

(2) WF and IWF to the nearest 0.1 gal/cycle/cu ft;

(3) EER to the nearest 0.01 lb/kWh/cycle;
(4) WER to the nearest 0.01 lb/gal/cycle;
(5) RMC to the nearest 0.1 percentage point; and
(6) Clothes container capacity to the nearest 0.1 cu ft.

[76 FR 12451, Mar. 7, 2011; 76 FR 24767, May 2, 2011, as amended at 77 FR 13936, Mar. 7, 2012; 77 FR 32379, May 31, 2012; 80 FR 46760, Aug. 5, 2015; 87 FR 33379, June 1, 2022; 89 FR 82061, Oct. 9, 2024]

### § 429.21 Residential clothes dryers.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to clothes dryers; and

(2) For each basic model of clothes dryers a sample of sufficient size shall be randomly selected and tested to ensure that—

(i) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The upper 97½ percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(ii) Any represented value of the energy factor, combined energy factor, or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The lower 97½ percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(3) The capacity of a basic model reported in accordance with paragraph (b)(2) of this section shall be the mean of the capacities measured for each tested unit of the basic model.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to clothes dryers; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: When using appendix D1 to subpart B of part 430 of this chapter, the combined energy factor in pounds per kilowatt hours (lb/kWh), the capacity in cubic feet (cu ft), the voltage in volts (V) (for electric dryers only), an indication if the dryer has automatic termination controls, and the hourly Btu rating of the burner (for gas dryers only); when using appendix D2 to subpart B of part 430, the combined energy factor in pounds per kilowatt hours (lb/kWh), the capacity in cubic feet (cu ft), the voltage in volts (V) (for electric dryers only), an indication if the dryer has automatic termination controls, the hourly Btu rating of the burner (for gas dryers only), and a list of the cycle setting selections for the energy test cycle as recorded in section 3.4.7 of appendix D2 to subpart B of part 430.

(c) *Reported values.* Values reported pursuant to this section must be rounded as follows: CEF to the nearest 0.01 lb/kWh, capacity to the nearest 0.1 cu ft, voltage to the nearest V, and hourly Btu rating to the nearest Btu.

[76 FR 12451, Mar. 7, 2011; 76 FR 24767, May 2, 2011, as amended at 78 FR 49644, Aug. 14, 2013; 86 FR 56638, Oct. 8, 2021]

### § 429.22 Direct heating equipment.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to direct heating equipment; and

(2) (i) For each basic model of direct heating equipment (not including furnaces) a sample of sufficient size shall be randomly selected and tested to ensure that—

(A) Any represented value of estimated annual operating cost, energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(*2*) The upper 97½ percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(B) Any represented value of the fuel utilization efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(*2*) The lower 97½ percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(ii) In calculating the measures of energy consumption for each unit tested, use the design heating requirement corresponding to the mean of the capacities of the units of the sample.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to direct heating equipment; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: Direct heating equipment, the annual fuel utilization efficiency (AFUE) in percent (%), the mean input capacity in British thermal units per hour (Btu/h), and the mean output capacity in British thermal units per hour (Btu/h).

[76 FR 12451, Mar. 7, 2011; 76 FR 24768, May 2, 2011, as amended at 76 FR 38292, June 30, 2011]

### § 429.23 Cooking products.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to cooking products; and

(2) For each basic model of cooking products a sample of sufficient size shall be randomly selected and tested to ensure that any represented value of estimated annual operating cost, standby mode power consumption, off

mode power consumption, annual energy consumption, integrated annual energy consumption, or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(i) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(ii) The upper 97½ percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n–1 degrees of freedom (from appendix A).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to conventional cooking tops, conventional ovens and microwave ovens; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: For conventional cooking tops and conventional ovens: the type of pilot light and a declaration that the manufacturer has incorporated the applicable design requirements. For microwave ovens, the average standby power in watts.

[76 FR 12451, Mar. 7, 2011; 76 FR 24769, May 2, 2011, as amended at 77 FR 65977, Oct. 31, 2012; 78 FR 4025, Jan. 18, 2013; 78 FR 36368, June 17, 2013; 81 FR 91445, Dec. 16, 2016]

### § 429.24 Pool heaters.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to pool heaters; and

(2) For each basic model of pool heater, randomly select and test a sample of sufficient size to ensure that any represented value of the thermal efficiency or integrated thermal efficiency, as applicable, or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

(i) The mean of the sample, where:

Or,

(ii) The lower 97½ percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(3) When certifying integrated thermal efficiency, the represented value for input capacity of a gas-fired pool heater basic model reported in accordance with paragraph (b)(2) of this section must be the mean of the input capacities measured for each tested unit of the basic model, as determined in accordance with the test procedure in appendix P of subpart B of part 430 of this chapter.

(4) When certifying integrated thermal efficiency, the represented value of active electrical power of an electric pool heater basic model reported in accordance with paragraph (b)(2) of this section must be the mean of the electrical power measured for each tested unit of the basic model, as determined in accordance with the test procedure in appendix P of subpart B of part 430 of this chapter.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to pool heaters; and

(2) Pursuant to § 429.12(b)(13), include in each certification report the following public product-specific information:

(i) For gas-fired pool heaters: the input capacity in British thermal units per hour (Btu/h) and either the thermal efficiency as a percentage (%) (when certifying compliance with the energy conservation standards specified at § 430.32(k)(1) of this chapter) or the integrated thermal efficiency as a percentage (%) (when certifying compliance with the energy conservation standards specified at § 430.32(k)(2) of this chapter), as applicable.

(ii) For electric pool heaters (when certifying compliance with the energy conservation standards specified at § 430.32(k)(2) of this chapter): the integrated thermal efficiency in percent (%) and the active electrical power in British thermal units per hour (Btu/h).

(c) *Reported values.* Round reported values pursuant to this subsection as follows:

(1) Integrated thermal efficiency for gas-fired pool heaters to the nearest tenth of one percent;

(2) Integrated thermal efficiency for electric pool heaters to the nearest one percent;

(3) Input capacity of a gas-fired pool heater to the nearest 1,000 Btu/h; and

(4) Active electrical power of an electric pool heater to the nearest 100 Btu/h.

[76 FR 12451, Mar. 7, 2011; 76 FR 24769, May 2, 2011; 89 FR 82061, Oct. 9, 2024]

### § 429.25 Television sets.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to televisions; and

(2) For each basic model of television, samples shall be randomly selected and tested to ensure that—

(i) Any represented value of power consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and $\bar{x}$ is the sample mean; $n$ is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) For on mode power consumption, the upper 95 percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

and $\bar{x}$ is the sample mean; $s$ is the sample standard deviation; $n$ is the number of samples; and $t_{0.95}$ is the t-statistic for a 95% one-tailed confidence interval with n−1 degrees of freedom (from appendix A of this subpart).

And

(C) For standby mode power consumption and power consumption measurements in modes other than on mode, the upper 90 percent confidence limit (UCL) of the true mean divided by 1.10, where:

$$UCL = \bar{x} + t_{0.90}\left(\frac{s}{\sqrt{n}}\right)$$

and $\bar{x}$ is the sample mean; $s$ is the sample standard deviation; $n$ is the number of samples; and $t_{0.90}$ is the t-statistic for a 90% one-tailed confidence interval with n−1 degrees of freedom (from appendix A of this subpart).

(ii) Any represented annual energy consumption of a basic model shall be determined by applying the AEC calculation in section 4 of appendix H to subpart B of part 430 of this chapter to the represented values of power consumption as calculated pursuant to paragraph (a)(2)(i) of this section.

(iii) *Rounding requirements.* The represented value of power consumption and the represented annual energy consumption shall be rounded as follows:

(A) For power consumption in the on and standby modes, the represented value shall be rounded according to the requirements specified in sections 4.1 and 4.3 of appendix H to subpart B of part 430 of this chapter.

(B) For annual energy consumption, the represented value shall be rounded according to the requirements specified in section 3.4 of appendix H to subpart B of part 430 of this chapter.

(b) [Reserved]

[78 FR 63840, Oct. 25, 2013, as amended at 88 FR 16109, Mar. 15, 2023]

### § 429.26 Fluorescent lamp ballasts.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to fluorescent lamp ballasts; and

(2) For each basic model of fluorescent lamp ballasts, a sample of sufficient size, not less than four, shall be randomly selected and tested to ensure that—

(i) Any represented value of the energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The upper 99 percent confidence limit (UCL) of the true mean divided by 1.01, where:

$$UCL = \bar{x} + t_{.99}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.99}$ is the t statistic for a 99% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(ii) Any represented value of the ballast luminous efficiency, power factor, or other measure of the energy efficiency or energy consumption of a basic model for which consumers would favor a higher value must be less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The lower 99 percent confidence limit (LCL) of the true mean divided by 0.99, where:

$$LCL = \bar{x} - t_{.99}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.99}$ is the t statistic for a 99% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(iii) The represented value of average total lamp arc power must be equal to the mean of the sample,

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Where:

$\bar{x}$ is the sample mean;
n is the number of units in the sample; and
$x_i$ is the $i^{th}$ unit.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to fluorescent lamp ballasts; and

(2) Pursuant to § 429.12(b)(13), a certification report must include the following public product-specific information: The ballast luminous efficiency, the average total lamp arc power, the power factor, the number of lamps operated by the ballast, and the type of lamps operated by the ballast (*i.e.*, wattage, base, shape, diameter, and length).

(c) *Rounding requirements.* (1) Round ballast luminous efficiency to the nearest thousandths place.

(2) Round power factor to the nearest hundredths place.

(3) Round average total lamp arc power to the nearest tenth of a watt.

[76 FR 12451, Mar. 7, 2011; 76 FR 24769, May 2, 2011, as amended at 81 FR 25600, Apr. 29, 2016; 85 FR 56493, Sept. 14, 2020]

### § 429.27 General service fluorescent lamps.

NOTE 1 TO § 429.27: Prior to February 17, 2023, certification reports must be submitted as required either in this section or 10 CFR 429.27 as it appears in the 10 CFR parts 200 through 499 edition revised as of January 1, 2022. On or after February 17, 2023, certification reports must be submitted as required in this section.

(a) *Determination of Represented Value.* Each manufacturer must determine represented values, which include certified ratings, for each basic model by testing, in accordance with the following sampling provisions.

(1) Units to be tested.

(i) When testing, use a sample comprised of production units. The same sample of units must be tested and used as the basis for representations for rated wattage, average lamp efficacy, color rendering index (CRI), and correlated color temperature (CCT).

(ii) For each basic model, randomly select and test a sample of sufficient size, but not less than 10 units, to ensure that represented values of average lamp efficacy are less than or equal to the lower of:

(A) The arithmetic mean of the sample: or,

(B) The lower 95 percent confidence limit (LCL) of the true mean divided by .97, where:

$$LCL = \bar{x} - t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(2) Any represented values of measures of energy efficiency or energy consumption for all individual models represented by a given basic model must be the same.

(3) Represented values of CCT, CRI and rated wattage must be equal to the arithmetic mean of the sample.

(b) *Certification reports.* (1) The requirements of § 429.12 apply to general service fluorescent lamps; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The testing laboratory's ILAC accreditation body's identification number or other approved identification assigned by the ILAC accreditation body, average lamp efficacy in lumens per watt (lm/W), rated wattage in watts (W), CCT in Kelvin (K), and CRI.

(c) *Rounding Requirements.* (1) Round rated wattage to the nearest tenth of a watt.

(2) Round average lamp efficacy to the nearest tenth of a lumen per watt.

(3) Round CCT to the nearest 100 kelvin (K).

(4) Round CRI to the nearest whole number.

[87 FR 53637, Aug. 31, 2022]

**§ 429.28 Faucets.**

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to faucets; and

(2) For each basic model of faucet, a sample of sufficient size shall be randomly selected and tested to ensure that any represented value of water consumption of a basic model for which consumers favor lower values shall be no less than the higher of the higher of:

(i) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(ii) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to faucets; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: For non-metering faucets, the maximum water use in gallons per minute (gpm) rounded to the nearest 0.1 gallon; for metering faucets, the maximum water use in gallons per cycle (gal/cycle) rounded to the nearest 0.01 gallon; and for all faucet types, the flow water pressure in pounds per square inch (psi).

[76 FR 12451, Mar. 7, 2011; 76 FR 24771, May 2, 2011, as amended at 78 FR 62985, Oct. 23, 2013]

**§ 429.29 Showerheads.**

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to showerheads; and

(2) For each basic model of a showerhead, a sample of sufficient size shall be randomly selected and tested to ensure that any represented value of water consumption of a basic model for which consumers favor lower values shall be greater than or equal to the higher of:

(i) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(ii) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to showerheads; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The maximum water use in gallons per minute (gpm) rounded to the nearest 0.1 gallon, the maximum flow water pressure in pounds per square inch (psi), and a declaration that the showerhead meets the requirements of § 430.32(p) pertaining to mechanical retention of the flow-restricting insert, if applicable.

[76 FR 12451, Mar. 7, 2011; 76 FR 24771, May 2, 2011, as amended at 78 FR 62985, Oct. 23, 2013]

### § 429.30 Water closets.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to water closets; and

(2) For each basic model of water closet, a sample of sufficient size shall be randomly selected and tested to ensure that any represented value of water consumption of a basic model for which consumers favor lower values shall be greater than or equal to the higher of:

(i) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(ii) The upper 90 percent confidence limit (UCL) of the true mean divided by 1.1, where:

$$UCL = \bar{x} + t_{.90}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.90}$ is the t statistic for a 90% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to water closets; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The maximum water use in gallons per flush (gpf), rounded to the nearest 0.01 gallon. For dual-flush water closets, the maximum water use to be reported is the flush volume observed when tested in the full-flush mode.

[76 FR 12451, Mar. 7, 2011; 76 FR 24771, May 2, 2011, as amended at 78 FR 62986, Oct. 23, 2013]

### § 429.31 Urinals.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to urinals; and

(2) For each basic model of urinal, a sample of sufficient size shall be randomly selected and tested to ensure that any represented value of water consumption of a basic model for which consumers favor lower values shall be greater than or equal to the higher of:

(i) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(ii) The upper 90 percent confidence limit (UCL) of the true mean divided by 1.1, where:

$$UCL = \bar{x} + t_{.90}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.90}$ is the t statistic for a 90% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to urinals; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The maximum water use in gallons per flush (gpf), rounded to the nearest 0.01 gallon, and for trough-type urinals, the maximum flow rate in gallons per minute (gpm), rounded to the nearest 0.01 gallon, and the length of the trough in inches (in).

[76 FR 12451, Mar. 7, 2011; 76 FR 24771, May 2, 2011, as amended at 78 FR 62986, Oct. 23, 2013]

### § 429.32 Ceiling fans.

NOTE 1 TO § 429.32: Prior to February 17, 2023, certification reports must be submitted as required either in this section or 10 CFR 429.32 as it appears in the 10 CFR parts 200 through 499 edition revised as of January 1, 2022. On or after February 17, 2023, certification reports must be submitted as required in this section.

(a) *Determination of represented value.* Manufacturers must determine the represented value, which includes the certified rating, for each basic model of ceiling fan by testing, in conjunction with the following sampling provisions:

(1) The requirements of § 429.11 are applicable to ceiling fans; and

(2) For each basic model of ceiling fan, a sample of sufficient size must be

randomly selected and tested to ensure that—

(i) Any represented value of the efficiency or airflow is less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample; or

(B) The lower 90 percent confidence limit (LCL) of the true mean divided by 0.9, where:

$$LCL = \bar{x} - t_{0.90}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.90}$ is the t statistic for a 90% one-tailed confidence interval with n−1 degrees of freedom (from appendix A to subpart B); and

(ii) Any represented value of the wattage is greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample; or

(B) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.1, where:

$$UCL = \bar{x} + t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n–1 degrees of freedom (from appendix A to this subpart); and

(3) For each basic model of ceiling fan,

(i) Any represented value of blade span, as defined in section 1.4 of appendix U to subpart B of part 430, is the mean of the blade spans measured for the sample selected as described in paragraph (a)(1) of this section, rounded to the nearest inch;

(ii) Any represented value of blade revolutions per minute (RPM) is the mean of the blade RPM measurements

measured for the sample selected as described in paragraph (a)(1) of this section, rounded to the nearest RPM;

(iii) Any represented value of blade edge thickness is the mean of the blade edge thicknesses measured for the sample selected as described in paragraph (a)(1) of this section, rounded to the nearest 0.01 inch;

(iv) Any represented value of the distance between the ceiling and the lowest point on the fan blades is the mean of the distances measured for the sample selected as described in paragraph (a)(1) of this section, rounded to the nearest quarter of an inch;

(v) Any represented value of tip speed is pi multiplied by represented value of blade span divided by twelve multiplied by the represented value of RPM, rounded to the nearest foot per minute; and

(vi) Any represented value of airflow (CFM) at high speed, including the value used to determine whether a ceiling fan is a highly-decorative ceiling fan as defined in section 1.10 of appendix U to subpart B of part 430, is determined pursuant to paragraph (a)(2)(i) and rounded to the nearest CFM.

(4) To determine representative values of airflow, energy use, and estimated yearly energy cost of an LSSD or VSD ceiling fan basic model, use the following provisions.

(i) Airflow. Determine the represented value for airflow by calculating the weighted-average airflow of an LSSD or VSD ceiling fan basic model at low and high fan speed as follows:

$$CFM_{ave} = \frac{CFM_{Low} \times 3.0 + CFM_{High} \times 3.4}{6.4}$$

Where:

$CFM_{ave}$ = represented value of ceiling fan airflow, rounded to the nearest CFM.

$CFM_{Low}$ = represented value of measured airflow, in cubic feet per minute, at low fan speed, pursuant to paragraph (a)(2)(i) of this section.

$CFM_{High}$ = represented value of measured airflow, in cubic feet per minute, at high fan speed, pursuant to paragraph (a)(2)(i) of this section.

3.0 = average daily operating hours at low fan speed, pursuant to Table 3 in appendix U to subpart B of part 430.

3.4 = average daily operating hours at high fan speed, pursuant to Table 3 in appendix U to subpart B of part 430.

6.4 = total average daily operating hours.

(ii) Energy Use. Determine represented value for energy use by calculating the weighted-average power consumption of an LSSD or VSD ceiling fan basic model at low and high fan speed as follows:

$$W_{ave} = \frac{W_{Low} \times 3.0 + W_{High} \times 3.4 + W_{Sb} \times 17.6}{6.4}$$

Where:

$W_{ave}$ = represented value power consumption, rounded to the nearest watt,

$W_{Low}$ = represented value of measured power consumption, in watts, at low fan speed, pursuant to paragraph (a)(2)(ii) of this section.

$W_{High}$ = represented value of measured power consumption, in watts, at high fan speed, pursuant to paragraph (a)(2)(ii) of this section.

$W_{Sb}$ = represented value of measured power consumption, in watts, in standby mode, pursuant to paragraph (a)(2)(ii) of this section.

3.0 = average daily operating hours at low fan speed, pursuant to Table 3 in appendix U to subpart B of part 430.

3.4 = average daily operating hours at high fan speed, pursuant to Table 3 in appendix U to subpart B of part 430.

17.6 = average daily standby mode hours, pursuant to Table 3 in appendix U to subpart B of part 430.
6.4 = total average daily operating hours.

(iii) Estimated Yearly Energy Cost. Determine the represented value for estimated yearly energy cost of an LSSD or VSD ceiling fan basic model at low and high fan speed as follows:

$$EYEC = \frac{W_{Low} \times 3.0 + W_{High} \times 3.4 + W_{Sb} \times 17.6}{1000} \times 365 \times C_{KWH}$$

Where:
EYEC = represented value for estimated yearly energy cost, rounded to the nearest dollar,
$W_{Low}$ = represented value of measured power consumption, in watts, at low fan speed, pursuant to paragraph (a)(2)(ii) of this section.
$W_{High}$ = represented value of measured power consumption, in watts, at high fan speed, pursuant to paragraph (a)(2)(ii) of this section.
$W_{Sb}$ = represented value of measured power consumption, in watts, in standby mode, pursuant to paragraph (a)(2)(ii) of this section.
$C_{KWH}$ = representative average unit cost of electrical energy in dollars per kilowatt-hour pursuant to 16 CFR part 305.
3.0 = average daily operating hours at low fan speed, pursuant to Table 3 in appendix U to subpart B of part 430
3.4 = average daily operating hours at high fan speed, pursuant to Table 3 in appendix U to subpart B of part 430.
17.6 = average daily standby mode hours, pursuant to Table 3 in appendix U to subpart B of part 430.
365 = number of days per year.
1000 = conversion factor from watts to kilowatts.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to ceiling fans; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information:

(i) For all ceiling fans: Blade span (in), and the number of speed control settings.

(ii) For small-diameter ceiling fans: A declaration of whether the ceiling fan is a multi-head ceiling fan, and the ceiling fan efficiency (CFM/W).

(iii) For large-diameter ceiling fans: Ceiling fan energy index (CFEI) for high speed, and 40 percent speed or the nearest speed that is not less than 40 percent speed.

(3) Pursuant to § 429.12(b)(13), a certification report shall include the following additional product-specific information:

(i) For all ceiling fans: A declaration that the manufacturer has incorporated the applicable design requirements.

(ii) For small-diameter ceiling fans: Standby power, blade edge thickness (in), airflow (CFM) at high speed, and blade revolutions per minute (RPM) at high speed.

(iii) For low-speed small-diameter ceiling fans: The distance (in) between the ceiling and the lowest point on the fan blades (in both hugger and standard configurations for multi-mount fans).

(c) *Rounding requirements.* Any represented value of ceiling fan efficiency, as described in paragraph (a)(2)(i) of this section, must be expressed in cubic feet per minute per watt (CFM/W) and rounded to the nearest whole number. Any represented value of ceiling fan energy index, as described in paragraph (a)(2)(i) of this section, must be expressed in CFEI and rounded to the nearest hundredth.

[76 FR 12451, Mar. 7, 2011, as amended at 81 FR 48639, July 25, 2016; 87 FR 43978, July 22, 2022; 87 FR 50422, Aug. 16, 2022]

### § 429.33 Ceiling fan light kits.

NOTE 1 TO § 429.33: Prior to February 17, 2023, certification reports must be submitted as required either in this section or 10 CFR 429.33 as it appears in the 10 CFR parts 200 through 499 edition revised as of January 1, 2022. On or after February 17, 2023, certification reports must be submitted as required in this section.

(a) *Determination of represented value.* Manufacturers must determine represented values, which includes certified ratings, for each basic model of

ceiling fan light kit in accordance with following sampling provisions.

(1) The requirements of § 429.11 are applicable to ceiling fan light kits, and

(2) For each basic model of ceiling fan light kit, the following sample size requirements are applicable to demonstrate compliance with the January 1, 2007 energy conservation standards:

(i) For ceiling fan light kits with medium screw base sockets that are packaged with compact fluorescent lamps, determine the represented values of each basic model of lamp packaged with the ceiling fan light kit in accordance with § 429.35.

(ii) For ceiling fan light kits with medium screw base sockets that are packaged with integrated light-emitting diode lamps, determine the represented values of each basic model of lamp packaged with the ceiling fan light kit in accordance with § 429.56.

(iii) For ceiling fan light kits with pin-based sockets that are packaged with fluorescent lamps, determine the represented values of each basic model of lamp packaged with the ceiling fan light kit in accordance with the sampling requirements in § 429.35.

(iv) For ceiling fan light kits with medium screw base sockets that are packaged with incandescent lamps, determine the represented values of each basic model of lamp packaged with the ceiling fan light kit in accordance with § 429.40, § 429.55 or § 429.66, as applicable.

(v) For ceiling fan light kits with sockets or packaged with lamps other than those described in paragraphs (a)(2)(i), (ii), (iii), or (iv) of this section, each unit must comply with the applicable design standard in § 430.32(s)(5) of this chapter.

(3) For ceiling fan light kits that require compliance with the January 21, 2020 energy conservation standards:

(i) Determine the represented values of each basic model of lamp packaged with each basic model of ceiling fan light kit, in accordance with the specified section:

(A) For compact fluorescent lamps, § 429.35;

(B) For general service fluorescent lamps, § 429.27;

(C) For incandescent lamps, § 429.40, § 429.55 or § 429.66, as applicable;

(D) For integrated LED lamps, § 429.56.

(E) For other fluorescent lamps (not compact fluorescent lamps or general service fluorescent lamps), § 429.35; and

(F) For consumer-replaceable SSL (not integrated LED lamps) and other SSL lamps that have an ANSI standard base and are not integrated LED lamps, § 429.56.

(ii) Determine the represented value of each basic model of non-consumer-replaceable SSL that is incorporated into each basic model of ceiling fan light kit by randomly selecting a sample of sufficient size and testing to ensure that any represented value of the energy efficiency of the integrated SSL circuitry basic model is less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample; Or,

(B) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.90, where:

$$LCL = \bar{x} - t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t

statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from appendix A to subpart B).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to ceiling fan light kits; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information:

(i) For ceiling fan light kits manufactured prior to January 21, 2020:

(A) For ceiling fan light kits with sockets for medium screw base lamps: The rated wattage in watts (W) and the system's efficacy in lumens per watt (lm/W).

(B) For ceiling fan light kits with pin-based sockets for fluorescent lamps: The rated wattage in watts (W), the system's efficacy in lumens per watt (lm/W), and the length of the lamp in inches (in).

(C) For ceiling fan light kits with any other socket type: The rated wattage in watts (W) and the number of individual sockets.

(ii) For ceiling fan light kits manufactured on or after January 21, 2020:

(A) For each basic model of lamp, each basic model of consumer-replaceable SSL, and/or each basic model of non-consumer-replaceable SSL packaged with the ceiling fan light kit, the brand, basic model number, test sample size, kind of lamp (*i.e.*, general service fluorescent lamp (GSFL); fluorescent lamp with a pin base that is not a GSFL; compact fluorescent lamp (CFL) with a medium screw base; CFL with a base that is not medium screw base [*e.g.*, candelabra base]; other fluorescent lamp [not GSFL or CFL]; general service incandescent lamp (GSIL); candelabra base incandescent lamp; intermediate base incandescent lamp; incandescent reflector lamp; other incandescent lamp [not GSIL, IRL, candelabra base or intermediate base incandescent lamp]; integrated LED lamp; non-consumer-replaceable SSL; consumer-replaceable SSL [not integrated LED lamps] and other SSL lamps that have an ANSI standard base and are not integrated LED lamps; other lamp not specified), lumen output in lumens (lm), and efficacy in lumens per watt (lm/W).

(B) For each lamp basic model identified in paragraph (b)(2)(ii)(A) of this section that is a compact fluorescent lamp with a medium screw base, the lumen maintenance at 40 percent of lifetime in percent (%) (and whether the value is estimated), the lumen maintenance at 1,000 hours in percent (%), the lifetime in hours (h) (and whether the value is estimated), and the sample size for rapid cycle stress testing and results in number of units passed (and whether the value is estimated). Estimates of lifetime, lumen maintenance at 40 percent of lifetime, and rapid cycle stress test surviving units may be reported until testing is complete. Manufacturers are required to maintain records of the development of all estimated values and any associated initial test data in accordance with § 429.71.

(3) Pursuant to § 429.12(b)(13), a certification report shall include the following additional product-specific information:

(i) For ceiling fan light kits with any other socket type manufactured prior to January 21, 2020, a declaration that the basic model meets the applicable design requirement, and the features that have been incorporated into the ceiling fan light kit to meet the applicable design requirement (*e.g.*, circuit breaker, fuse, ballast).

(ii) For ceiling fan light kits manufactured on or after January 21, 2020:

(A) A declaration that the ceiling fan light kit is packaged with lamps sufficient to fill all of the lamp sockets;

(B) For each basic model of lamp, each basic model of consumer-replaceable SSL, and/or each basic model of non-consumer-replaceable SSL packaged with the ceiling fan light kit, a declaration that, where applicable, the lamp basic model was tested by a laboratory accredited as required under § 430.25 of this chapter; and

(C) For ceiling fan light kits with pin-based sockets for fluorescent lamps, a declaration that each ballast for such lamps is an electronic ballast.

(c) *Rounding requirements.* (1) Any represented value of efficacy of ceiling fan light kits as described in paragraph (a) of this section must be expressed in lumens per watt and rounded to the nearest tenth of a lumen per watt.

(2) Round lumen output to three significant digits.

(3) Round lumen maintenance at 1,000 hours to the nearest tenth of a percent.

(4) Round lumen maintenance at 40 percent of lifetime to the nearest tenth of a percent.

(5) Round lifetime to the nearest whole hour.

[76 FR 12451, Mar. 7, 2011; 76 FR 24772, May 2, 2011, as amended at 80 FR 80225, Dec. 24, 2015; 81 FR 632, Jan. 6, 2016; 81 FR 43425, July 1, 2016; 84 FR 8413, Mar. 8, 2019; 87 FR 43978, July 22, 2022; 87 FR 54330, Sept. 6, 2022; 87 FR 53638, Aug. 31, 2022; 88 FR 21072, Apr. 10, 2023; 89 FR 82062, Oct. 9, 2024]

### § 429.34 Torchieres.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to torchieres; and

(2) Reserved

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to torchieres; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following additional product-specific information: A declaration that the basic model meets the applicable design requirement and the features that have been incorporated into the torchiere to meet the applicable design requirement (*e.g.*, circuit breaker, fuse, ballast).

### § 429.35 Compact fluorescent lamps.

(a) *Determination of Represented Value.* Manufacturers must determine represented values, which include the certified ratings, for each basic model of compact fluorescent lamp by testing, in conjunction with the following sampling provisions:

(1) *Units to be tested.* (i) The requirements of § 429.11(a) are applicable except that the sample must be comprised of production units; and

(ii)(A) For each basic model of integrated compact fluorescent lamp, the minimum number of units tested shall be no less than 10 units when testing for the initial lumen output, input power, initial lamp efficacy, lumen maintenance at 1,000 hours, lumen maintenance at 40 percent of lifetime, lifetime, CCT, CRI, power factor, and standby mode power. If more than 10 units are tested as part of the sample, the total number of units must be a multiple of 2. The same sample of units must be used as the basis for representations for initial lumen output, input power, initial lamp efficacy, lumen maintenance at 1,000 hours, lumen maintenance at 40 percent of lifetime, lifetime, CCT, CRI, power factor, and standby mode power. No less than three units from the same sample of units must be used when testing for the start time. Exactly six unique units (*i.e.*, units that have not previously been tested under this paragraph (a)(1)(ii) but are representative of the same basic model tested under this paragraph (a)(1)(ii)) must be used for rapid cycle stress testing.

(B) For each basic model of non-integrated compact fluorescent lamp, the minimum number of units tested shall be no less than 10 units when testing for the initial lumen output, input power, initial lamp efficacy, lumen maintenance at 40 percent of lifetime, lifetime, CCT, and CRI. If more than 10 units are tested as part of the sample, the total number of units must be a multiple of 2. The same sample of units must be used as the basis for representations for initial lumen output, input power, initial lamp efficacy, lumen maintenance at 40 percent of lifetime, lifetime, CCT, and CRI.

(iii) For each basic model, a sample of sufficient size shall be randomly selected and tested to ensure that:

(A) Represented values of initial lumen output, initial lamp efficacy, lumen maintenance at 1,000 hours, lumen maintenance at 40 percent of lifetime, CRI, power factor, or other measure of energy consumption of a basic model for which consumers would favor higher values must be less than or equal to the lower of:

(*1*) The mean of the sample,

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Where:

$\bar{x}$ is the sample mean,
$n$ is the number of units in the sample, and
$x_i$ is the $i^{th}$ unit;

Or,

(*2*) The lower 97.5-percent confidence limit (LCL) of the true mean divided by 0.95,

$$LCL = \bar{x} - t_{0.975}\left(\frac{s}{\sqrt{n}}\right)$$

Where:

$\bar{x}$ is the sample mean of the characteristic value;
$s$ is the sample standard deviation;
$n$ is the number of units in the sample, and
$t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from appendix A of this subpart).

(B) Represented values of input power, standby mode power, start time or other measure of energy consumption of a basic model for which consumers would favor lower values must be greater than or equal to the higher of:

(*1*) The mean of the sample,

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Where:

$\bar{x}$ is the sample mean,
n is the number of units in the sample, and
$x_i$ is the $i^{th}$ unit;

Or,

(*2*) The upper 97.5-percent confidence limit (UCL) of the true mean divided by 1.05,

$$UCL = \bar{x} + t_{0.975}\left(\frac{s}{\sqrt{n}}\right)$$

Where:

$\bar{x}$ is the sample mean of the characteristic value;
s is the sample standard deviation;
n is the number of units in the sample, and
$t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from appendix A of this subpart).

(C) The represented value of CCT must be equal to the mean of the sample,

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Where:

$\bar{x}$ is the sample mean,
n is the number of units in the sample, and
$x_i$ is the $i^{th}$ unit.

(D) The represented value of lifetime must be equal to or less than the median time to failure of the sample (calculated as the arithmetic mean of the time to failure of the two middle sample units when the numbers are sorted in value order).

(E) The represented value of the results of rapid cycle stress testing must be

(*1*) Expressed in the number of surviving units and

(*2*) Based on a lifetime value that is equal to or greater than the represented value of lifetime.

(2) The represented value of life (in years) of a compact fluorescent lamp must be calculated by dividing the represented lifetime of a compact fluorescent lamp as determined in (a)(1) of this section by the estimated annual operating hours as specified in 16 CFR 305.15(b)(3)(iii).

(3) The represented value of the estimated annual energy cost for a compact fluorescent lamp, expressed in dollars per year, must be the product of the input power in kilowatts, an electricity cost rate as specified in 16 CFR 305.15(b)(1)(ii), and an estimated average annual use as specified in 16 CFR 305.15(b)(1)(ii).

(4) For compliance with standards specified in § 430.32(u) as it appeared in 10 CFR parts 200–499 edition revised as of January 1, 2016, initial lamp efficacy may include a 3 percent tolerance added to the value determined in accordance with paragraph (a)(1)(iii)(A) of this section.

(5) The represented value of lumen maintenance at 40 percent of lifetime must be based on a lifetime value that is equal to or greater than the represented value of lifetime.

(6) Estimated values may be used for representations when initially testing a new basic model or when new/additional testing is required.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to compact fluorescent lamps; and

(2) Values reported in certification reports are represented values. Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information:

(i) For each basic model of medium base CFL when certifying compliance to the standards in § 430.32(u) as it appeared in 10 CFR parts 200–499 edition revised as of January 1, 2016, the testing laboratory's ILAC accreditation body's identification number or other approved identification assigned by the ILAC accreditation body, the date of first manufacture, the seasoning time in hours (h), the initial lumen output in lumens (lm), the input power in watts (W), the initial lamp efficacy in lumens per watt (lm/W), the number of sample units replaced during the seasoning period within each unique sample set used in determining the represented value, the lumen maintenance at 40 percent of lifetime in percent (%) (and whether value is estimated), the lifetime in hours (h) (and whether value is estimated), life in years (and whether value is estimated), the lumen maintenance at 1,000 hours in percent (%), and the results of rapid cycle stress testing in number of units passed. or the initial certification of new basic models or any subsequent certification based on new testing, estimates of lifetime, life, lumen maintenance at 40 percent of lifetime, and rapid cycle stress test surviving units may be reported (if indicated in the certification report) until testing is complete. When reporting estimated values, the certification report must specifically describe the prediction method, which must be generally representative of the methods specified in appendix W. Manufacturers are required to maintain records in accordance with § 429.71 of the development of

all estimated values and any associated initial test data.

(ii) For each basic model of integrated CFL when certifying compliance with general service lamp energy conservation standards, the testing laboratory's ILAC accreditation body's identification number or other identification assigned by the ILAC accreditation body, the date of first manufacture, a statement that the compact fluorescent lamp is integrated, the seasoning time in hours (h), the initial lumen output in lumens (lm), the input power in watts (W), the initial lamp efficacy in lumens per watt (lm/W), the CCT in kelvin (K), CRI, the lumen maintenance at 1,000 hours in percent (%), the lumen maintenance at 40 percent of lifetime in percent (%) (and whether value is estimated), start time in milliseconds, power factor, standby mode energy consumption in watts (W), the results of rapid cycle stress testing in number of units passed, the lifetime in hours (h) (and whether value is estimated), life in years (and whether value is estimated), and the number of sample units replaced during the seasoning period within the sample set used in determining the represented value. Estimates of lifetime, life, lumen maintenance at 40 percent of lifetime, and rapid cycle stress test surviving units may be reported (if indicated in the certification report) until testing is complete. When reporting estimated values, the certification report must specifically describe the prediction method, which must be generally representative of the methods specified in appendix W. Manufacturers are required to maintain records in accordance with § 429.71 of the development of all estimated values and any associated initial test data.

(iii) For each basic model of non-integrated CFL when certifying compliance with general service lamp energy conservation standards, the testing laboratory's ILAC accreditation body's identification number or other identification assigned by the ILAC accreditation body, the date of first manufacture, a statement that the compact fluorescent lamp is non-integrated, the initial lumen output in lumens (lm), the input power in watts (W), the initial lamp efficacy in lumens per watt (lm/W), the CCT in kelvin (K), CRI, the lumen maintenance at 40 percent of lifetime in percent (%) (and whether value is estimated), the lifetime in hours (h) (and whether value is estimated), and the number of sample units replaced during the seasoning period within each unique sample set used in determining the represented value. Estimates of lifetime and lumen maintenance at 40 percent of lifetime may be reported (if indicated in the certification report) until testing is complete. When reporting estimated values, the certification report must specifically describe the prediction method, which must be generally representative of the methods specified in appendix W. Manufacturers are required to maintain records in accordance with § 429.71 of the development of all estimated values and any associated initial test data.

(c) *Rounding requirements.* For represented values,

(1) Round input power to the nearest tenth of a watt.

(2) Round lumen output to three significant digits.

(3) Round initial lamp efficacy to the nearest tenth of a lumen per watt.

(4) Round lumen maintenance at 1,000 hours to the nearest tenth of a percent.

(5) Round lumen maintenance at 40 percent of lifetime to the nearest tenth of a percent.

(6) Round CRI to the nearest whole number.

(7) Round power factor to the nearest hundredths place.

(8) Round lifetime to the nearest whole hour.

(9) Round CCT to the nearest 100 kelvin (K).

(10) Round standby mode power to the nearest tenth of a watt; and

(11) Round start time to the nearest whole millisecond.

[81 FR 59415, Aug. 29, 2016]

### § 429.36 Dehumidifiers.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to dehumidifiers; and

(2) For each basic model of dehumidifier selected for testing, a sample of sufficient size shall be randomly selected and tested to ensure that—

(i) Any represented value of energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.10, where:

$$UCL = \bar{x} + t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(ii) Any represented value of the energy factor, integrated energy factor, or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.90, where:

$$LCL = \bar{x} - t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(3) The capacity of a basic model is the mean of the measured capacities for each tested unit of the basic model. Round the mean capacity value to two decimal places.

(4) For whole-home dehumidifiers, the case volume of a basic model is the mean of the measured case volumes for each tested unit of the basic model. Round the mean case volume value to one decimal place.

(5) Round the value of energy factor or integrated energy factor for a basic model to two decimal places.

(6) Dehumidifiers distributed in commerce by the manufacturer with the ability to operate as both a portable and whole-home dehumidifier by means of installation or removal of an optional ducting kit, must be rated and certified under both configurations.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to dehumidifiers; and

(2) Pursuant to § 429.12(b)(13), a certification report must include the following public product-specific information:

(i) For dehumidifiers tested in accordance with appendix X1: The integrated energy factor in liters per kilowatt hour (liters/kWh), capacity in pints per day, and for whole-home dehumidifiers, case volume in cubic feet.

(ii) [Reserved]

[76 FR 12451, Mar. 7, 2011; 76 FR 24773, May 2, 2011, as amended at 77 FR 65977, Oct. 31, 2012; 80 FR 45824, July 31, 2015; 81 FR 38395, June 13, 2016; 89 FR 82062, Oct. 9, 2024]

### § 429.37 External power supplies.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to external power supplies; and

(2) For each basic model of external power supply selected for testing, a sample of sufficient size shall be randomly selected and tested to ensure that—

(i) Any represented value of the estimated energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The upper 97.5 percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(ii) Any represented value of the estimated energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The lower 97.5 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to external power supplies except that required information may be reported on the basis of a basic model or a design family. If certifying using a design family, for § 429.12(b)(6), report the individual manufacturer's model numbers covered by the design family.

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information:

(i) *External power supplies:* The average active mode efficiency as a percentage (%), no-load mode power consumption in watts (W), nameplate output power in watts (W), nameplate output voltage in volts (V), the effective wire gauge in American wire gauge (AWG) and length in feet (ft) of the recommended or included output cord, and, if missing from the nameplate, the output current in amperes (A) of the basic model or the output current in amperes (A) of the highest- and lowest-voltage models within the external power supply design family.

(ii) *Switch-selectable single-voltage external power supplies:* The average active mode efficiency as a percentage (%) value, no-load mode power consumption in watts (W) using the lowest and highest selectable output voltages, the lowest and highest selectable output voltages in volts (V), nameplate output power in watts (W), the effective wire gauge in American wire gauge (AWG) and length in feet (ft) of the recommended or included output cord, and, if missing from the nameplate, the output current in amperes (A).

(iii) *Adaptive single-voltage external power supplies:* The average active-mode efficiency as a percentage (%) at the highest and lowest nameplate output voltages, no-load mode power consumption in watts (W), nameplate output power in watts (W) at the lowest and highest nameplate output voltages, the lowest and highest nameplate output voltages in volts (V), the effective wire gauge in American wire gauge (AWG) and length in feet (ft) of the recommended or included output cord, and, if missing from the nameplate, the output current in amperes (A) at the highest and lowest nameplate output voltages.

(iv) *External power supplies that are exempt from no-load mode requirements under § 430.32(w)(5) of this chapter:* A statement that the product is designed to be connected to a security or life safety alarm or surveillance system component, the average active-mode efficiency as a percentage (%), the nameplate output power in watts (W), the nameplate output voltage in volts

(V), the effective wire gauge in American wire gauge (AWG) and length in feet (ft) of the recommended or included output cord, and, if missing from the nameplate, the certification report must also include the output current in amperes (A) of the basic model or the output current in amperes (A) of the highest- and lowest-voltage models within the external power supply design family.

(3) Pursuant to § 429.12(b)(13), a certification report for external power supplies that are exempt from the energy conservation standards at § 430.32(w)(1)(ii) of this chapter pursuant to § 430.32(w)(2) of this chapter must include the following additional information if, in aggregate, the total number of exempt EPSs sold as spare and service parts by the certifier exceeds 1,000 units across all models: The total number of units of exempt external power supplies sold during the most recent 12-calendar-month period ending on July 31, starting with the annual report due on September 1, 2017. The certification report must also include the exact timeframe (*e.g.*, from August 2016 to July 2017) of this most recent 12-calendar-month period.

(c) *Exempt external power supplies.* (1) For external power supplies that are exempt from energy conservation standards pursuant to § 430.32(w)(2) of this chapter and are not required to be certified pursuant to § 429.12(a) as compliant with an applicable standard, the importer or domestic manufacturer must, no later than September 1, 2017, and annually by each September 1st thereafter, submit a report providing the following information if, in aggregate, the total number of exempt EPSs sold as spare and service parts by the importer or manufacturer exceeds 1,000 units across all models:

(i) The importer or domestic manufacturer's name and address;

(ii) The brand name;

(iii) The number of units sold during the most recent 12-calendar-month period ending on July 31; and

(iv) The exact timeframe (*e.g.*, from August 2016 to July 2017) of this most recent 12-calendar-month period.

(2) The report must be submitted to DOE in accordance with the submission procedures set forth in § 429.12(h).

[76 FR 12451, Mar. 7, 2011; 76 FR 24773, May 2, 2011, as amended at 76 FR 57899, Sept. 19, 2011; 80 FR 51440, Aug. 25, 2015; 81 FR 30163, May 16, 2016; 84 FR 442, Jan. 29, 2019; 89 FR 82062, Oct. 9, 2024]

### § 429.38 Non-class A external power supplies. [Reserved]

### § 429.39 Battery chargers.

(a) *Determination of represented value.* Manufacturers must determine represented values, which include certified ratings, for each basic model of battery charger in accordance with the following sampling provisions.

(1) *Represented values* include:

(i) For all battery chargers other than uninterruptible power supplies (UPSs) tested under appendix Y to subpart B of part 430 of this chapter: The unit energy consumption (UEC) in kilowatt-hours per year (kWh/yr), battery discharge energy ($E_{batt}$) in watt hours (Wh), 24-hour energy consumption ($E_{24}$) in watt hours (Wh), maintenance mode power ($P_m$) in watts (W), standby mode power ($P_{sb}$) in watts (W), off mode power ($P_{off}$) in watts (W), and duration of the charge and maintenance mode test ($t_{cd}$) in hours (hrs);

(ii) For all wired and fixed-location wireless battery chargers other than uninterruptible power supplies (UPSs) tested under appendix Y1 to subpart B of part 430 of this chapter: Battery discharge energy ($E_{batt}$) in watt hours (Wh), active charge energy ($E_a$) in watt hours (Wh), maintenance mode power ($P_m$) in watts (W), no-battery mode power ($P_{nb}$) in watts (W), standby mode power ($P_{sb}$) in watts (W), off mode power ($P_{off}$) in watts (W), and duration of the charge and maintenance mode test ($t_{cd}$) in hours (hrs);

(iii) For all open-placement wireless battery chargers other than uninterruptible power supplies (UPSs) tested under appendix Y1 to subpart B of part 430 of this chapter: no-battery mode power ($P_{nb}$) in watts (W);

(iv) For UPSs: average load adjusted efficiency ($Eff_{avg}$).

(2) *Units to be tested.* (i) The general requirements of § 429.11 are applicable to all battery chargers; and

(ii) For each basic model of battery chargers other than UPSs tested under appendix Y to subpart B of part 430 of this chapter, a sample of sufficient size must be randomly selected and tested to ensure that the represented value of UEC is greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; $n$ is the number of samples; and $x_i$ is the UEC of the $i$th sample; or,

(B) The upper 97.5-percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{0.975}\left(\frac{s}{\sqrt{n}}\right)$$

and $\bar{x}$ is the sample mean; $s$ is the sample standard deviation; $n$ is the number of samples; and $t_{0.975}$ is the t-statistic for a 97.5-percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A of this subpart).

(iii) For each basic model of battery chargers other than UPSs tested under appendix Y to subpart B of part 430 of this chapter, using the sample from paragraph (a)(2)(ii) of this section, calculate the represented values of each metric (*i.e.*, maintenance mode power ($P_m$), standby power ($P_{sb}$), off mode power ($P_{off}$), battery discharge energy ($E_{batt}$), 24-hour energy consumption ($E_{24}$), and duration of the charge and maintenance mode test ($t_{cd}$)), where the represented value of the metric is:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean, $n$ is the number of samples, and $x_i$ is the measured value of the $i$th sample for the metric.

(iv) For each basic model of UPSs, the represented value of $Eff_{avg}$ must be calculated using one of the following two methods:

(A) A sample of sufficient size must be randomly selected and tested to ensure that the represented value of $Eff_{avg}$ is less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; $n$ is the number of samples; and $x_i$ is the $Eff_{avg}$ of the $i$th sample; or,

(*2*) The lower 97.5-percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{0.975}\left(\frac{s}{\sqrt{n}}\right)$$

and $\bar{x}$ is the sample mean; $s$ is the sample standard deviation; $n$ is the number of samples; and $t_{0.975}$ is the t-statistic for a 97.5-percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A of this subpart).

(B) The represented value of $Eff_{avg}$ is equal to the $Eff_{avg}$ of the single unit tested.

(v) For each basic model of battery chargers other than UPSs tested under appendix Y1 to subpart B of part 430 of this chapter, a sample of sufficient size must be randomly selected and tested to ensure that the represented value of $E_a$ for all wired and fixed-location wireless chargers (or the represented value of $P_{nb}$ for all open-placement wireless chargers) is greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; $n$ is the number of samples; and $x_i$ is the $E_a$ (or $P_{nb,}$ when applicable) of the $i$th sample; or,

(B) The upper 97.5-percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{0.975}\left(\frac{s}{\sqrt{n}}\right)$$

and, $\bar{x}$ is the sample mean; $s$ is the sample standard deviation; $n$ is the number of samples; and $t_{0.975}$ is the Student's t-Distribution Values for a 97.5-percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A to this subpart).

(vi) For each basic model of battery chargers other than UPSs tested under appendix Y1 to subpart B of part 430 of this chapter, using the sample from paragraph (a)(2)(v) of this section, calculate the applicable represented values of each metric (*i.e.*, maintenance mode power ($P_m$), no-battery mode power ($P_{nb}$), standby power ($P_{sb}$), off mode power ($P_{off}$), battery discharge energy ($E_{batt}$), and duration of the charge and maintenance mode test ($t_{cd}$)), where the represented value of the metric is:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; $n$ is the number of samples; and $x_i$ is the measured value of the $i$th sample for the metric.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to all battery chargers.

(2) Pursuant to § 429.12(b)(13), when tested under appendix Y to subpart B of part 430 of this chapter, a certification report must include the following product-specific information for all battery chargers other than UPSs: The nameplate battery voltage of the test battery in volts (V), the nameplate battery charge capacity of the test battery in ampere-hours (Ah), and the nameplate battery energy capacity of the test battery in watt-hours (Wh). A certification report must also include the represented values, as determined in paragraph (a) of this section for the maintenance mode power ($P_m$), standby mode power ($P_{sb}$), off mode power ($P_{off}$), battery discharge energy ($E_{batt}$), 24-hour energy consumption ($E_{24}$), duration of the charge and maintenance mode test ($t_{cd}$), and unit energy consumption (UEC).

(3) Pursuant to § 429.12(b)(13), when tested under appendix Y to subpart B of part 430 of this chapter, a certification report must include the following product-specific information for all battery chargers other than UPSs: The manufacturer and model of the test battery, and the manufacturer and model, when applicable, of the external power supply.

(4) Pursuant to § 429.12(b)(13), a certification report must include the following product-specific information for all UPSs: Supported input dependency mode(s); active power in watts (W); apparent power in volt-amperes (VA); rated input and output voltages in volts (V); efficiencies at 25 percent, 50 percent, 75 percent and 100 percent of the reference test load; and average load adjusted efficiency of the lowest and highest input dependency modes.

(5) Pursuant to § 429.12(b)(13), when tested under appendix Y1 to subpart B of part 430 of this chapter, a certification report must include the following product-specific information for all wired and fixed-location wireless battery chargers other than UPSs: The manufacturer and model of the test battery, the manufacturer and model, when applicable, of the external power supply, the nameplate battery voltage of the test battery in volts (V), the nameplate battery charge capacity of the test battery in ampere-hours (Ah), and the nameplate battery energy capacity of the test battery in watt-hours (Wh). A certification report must also include the represented values, as determined in paragraph (a) of this section for the maintenance mode power ($P_m$), no-battery mode power ($P_{nb}$), standby mode power ($P_{sb}$), off mode power ($P_{off}$), battery discharge energy ($E_{batt}$), 24-hour energy consumption ($E_{24}$), active charge energy ($E_a$), and duration of the charge and maintenance mode test ($t_{cd}$).

(6) Pursuant to § 429.12(b)(13), when tested under appendix Y1 to subpart B of part 430 of this chapter, a certification report must include the following product-specific information for all open-placement wireless battery chargers other than UPSs: The manufacturer and model, when applicable, of the external power supply. A certification report must also include the represented values, as determined in paragraph (a) of this section for the no-battery mode power ($P_{nb}$).

[81 FR 89821, Dec. 12, 2016, as amended at 89 FR 82063, Oct. 9, 2024]

### § 429.40 Candelabra base incandescent lamps and intermediate base incandescent lamps.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to candelabra base incandescent lamps; and

(2) For each basic model of candelabra base incandescent lamp and intermediate base incandescent lamp, a minimum sample of 21 lamps shall be randomly selected and tested. Any represented value of lamp wattage of a basic model shall be based on the sample and shall be less than or equal to the lower of:

(i) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(ii) The lower 97.5 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A of this part).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to candelabra base and intermediate base incandescent lamps; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information:

(i) Candelabra base incandescent lamp: The rated wattage in watts (W).

(ii) Intermediate base incandescent lamp: The rated wattage in watts (W).

[76 FR 12451, Mar. 7, 2011; 76 FR 24774, May 2, 2011]

### § 429.41 Commercial warm air furnaces.

(a) *Determination of represented value.* Manufacturers must determine the represented value, which includes the certified rating, for each basic model of commercial warm air furnace either by testing, in conjunction with the applicable sampling provisions, or by applying an AEDM.

(1) *Units to be tested.* (i) If the represented value is determined through testing, the general requirements of § 429.11 are applicable; and

(ii) For each basic model selected for testing, a sample of sufficient size shall be randomly selected and tested to ensure that—

(A) Any represented value of energy consumption or other measure of energy use of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample; Or,

$$UCL = \bar{x} + t_{0.95}(\frac{s}{\sqrt{n}})$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n − 1 degrees of freedom (from Appendix A to subpart B of part 429). And,

(*2*) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.05, where:

(B) Any represented value of energy efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample; Or,

(*2*) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{0.95}(\frac{s}{\sqrt{n}})$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n − 1 degrees of freedom (from Appendix A to subpart B of part 429).

(2) *Alternative efficiency determination methods.* In lieu of testing, a represented value of efficiency or consumption for a basic model of commercial warm air furnace must be determined through the application of an AEDM pursuant to the requirements of § 429.70 and the provisions of this section, where:

(i) Any represented value of energy consumption or other measure of energy use of a basic model for which consumers would favor lower values shall be greater than or equal to the output of the AEDM and less than or equal to the Federal standard for that basic model; and

(ii) Any represented value of energy efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the output of the AEDM and greater than or equal to the Federal standard for that basic model.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to commercial warm air furnaces; and

(2) Pursuant to § 429.12(b)(13), a certification report must include the following public, equipment-specific information: The thermal efficiency in percent (%), and the maximum rated input capacity in British thermal units per hour (Btu/h).

(3) Pursuant to § 429.12(b)(13), a certification report must include the following additional equipment-specific information:

(i) Whether the basic model is engineered-to-order; and

(ii) For any basic model rated with an AEDM, whether the manufacturer elects the witness test option for verification testing. (See § 429.70(c)(5)(iii) for options). However, the manufacturer may not select more than 10% of AEDM-rated basic models.

(4) Pursuant to § 429.12(b)(13), a certification report may include supplemental testing instructions in PDF format. If necessary to run a valid test, the equipment-specific, supplemental information must include any additional testing and testing set up instructions (*e.g.*, specific operational or control codes or settings), which would be necessary to operate the basic model under the required conditions specified by the relevant test procedure. A manufacturer may also include with a certification report other supplementary items in PDF format (*e.g.*, manuals) for DOE consideration in performing testing under subpart C of this part.

[79 FR 25500, May 5, 2014, as amended at 80 FR 151, Jan. 5, 2015]

## § 429.42 Commercial refrigerators, freezers, and refrigerator-freezers.

(a) *Determination of represented value.* Manufacturers must determine the represented value, which includes the certified rating, for each basic model of commercial refrigerator, freezer, or refrigerator-freezer either by testing, in conjunction with the applicable sampling provisions, or by applying an AEDM.

(1) *Units to be tested.* (i) If the represented value for a given basic model is determined through testing, the general requirements of § 429.11 are applicable; and

(ii) For each basic model selected for testing, a sample of sufficient size shall be randomly selected and tested to ensure that—

(A) Any represented value of energy consumption or other measure of energy use of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample; or,

(*2*) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.10, where:

$$UCL = \bar{x} + t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A to subpart B of part 429); And,

(B) Any represented value of the energy efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample; or,

(2) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.90, where:

$$LCL = \bar{x} - t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A to subpart B of part 429).

(2) *Alternative efficiency determination methods.* In lieu of testing, a represented value of efficiency or consumption for a basic model of commercial refrigerator, freezer or refrigerator-freezer must be determined through the application of an AEDM pursuant to the requirements of § 429.70 and the provisions of this section, where:

(i) Any represented value of energy consumption or other measure of energy use of a basic model for which consumers would favor lower values shall be greater than or equal to the output of the AEDM and less than or equal to the Federal standard for that basic model; and

(ii) Any represented value of energy efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the output of the AEDM and greater than or equal to the Federal standard for that basic model.

(3) *Represented value calculations.* The volume and total display area (TDA) of a basic model, as applicable, is the mean of the measured volumes and the mean of the measured TDAs, as applicable, for the tested units of the basic model, based on the same tests used to determine energy consumption.

(4) *Convertible equipment.* Each basic model of commercial refrigerator, freezer, or refrigerator-freezer that is capable of operating at integrated average temperatures that spans the operating temperature range of multiple equipment classes, either by adjusting a thermostat for a basic model or by the marketed, designed, or intended operation for a basic model with a remote condensing unit but without a thermostat, must determine the represented values, which includes the certified ratings, either by testing, in conjunction with the applicable sampling provisions, or by applying an AEDM to comply with the requirements necessary to certify to each equipment class that the basic model is capable of operating within.

(i) *Customer order storage cabinets.* For customer order storage cabinets that have individual-secured compartments that are convertible between the ≥32 °F and <32 °F operating temperatures, the customer order storage cabinets must determine the represented values, which includes the certified ratings, either by testing, in conjunction with the applicable sampling provisions, or by applying an AEDM, with all convertible compartments operating either as medium temperature refrigerators or all convertible compartments as low-temperature freezers, or at the lowest application product temperature for each equipment class as specified in § 431.64 of this chapter, to comply with the requirements necessary to certify to each equipment class that the basic model is capable of operating within.

(ii) [Reserved]

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to commercial refrigerators, freezers, and refrigerator-freezers; and

(2) Pursuant to § 429.12(b)(13), a certification report must include the following public, equipment-specific information:

(i) The daily energy consumption in kilowatt hours per day (kWh/day);

(ii) The rating temperature (e.g. lowest product application temperature, if applicable) in degrees Fahrenheit ( °F); and

(iii) The chilled or frozen compartment volume in cubic feet ($ft^3$), the adjusted volume in cubic feet ($ft^3$), or the total display area (TDA) in feet squared ($ft^2$) (as appropriate for the equipment class).

(3) Pursuant to § 429.12(b)(13), a certification report must include the following additional, equipment-specific information:

(i) Whether the basic model is engineered-to-order; and

(ii) For any basic model rated with an AEDM, whether the manufacturer elects the witness test option for verification testing. (See § 429.70(c)(5)(iii) for options). However, the manufacturer may not select more than 10% of AEDM-rated basic models.

(4) Pursuant to § 429.12(b)(13), a certification report must include supplemental information submitted in PDF format. The equipment-specific, supplemental information must include any additional testing and testing set up instructions (*e.g.*, charging instructions) for the basic model; identification of all special features that were included in rating the basic model; and all other information (*e.g.*, any specific settings or controls) necessary to operate the basic model under the required conditions specified by the relevant test procedure. A manufacturer may also include with a certification report other supplementary items in PDF format (*e.g.*, manuals) for DOE to consider when performing testing under subpart C of this part.

[76 FR 12451, Mar. 7, 2011; 76 FR 24775, May 2, 2011, as amended at 76 FR 38292, June 30, 2011; 78 FR 79593, Dec. 31, 2013; 79 FR 22307, Apr. 21, 2014; 79 FR 25501, May 5, 2014; 80 FR 151, Jan. 5, 2015; 88 FR 66221, Sept. 26, 2023]

### § 429.43 Commercial heating, ventilating, air conditioning (HVAC) equipment.

(a) Determination of represented values. Manufacturers must determine the represented values, which include the certified ratings, for each basic model of commercial HVAC equipment either by testing, in conjunction with the applicable sampling provisions, or by applying an AEDM.

(1) *Units to be tested.* (i) If the represented value is determined through testing, the general requirements of § 429.11 are applicable; and

(ii) For each basic model selected for testing, a sample of sufficient size shall be randomly selected and tested to ensure that—

(A) Any represented value of energy consumption or other measure of energy use of a basic model, or of a tested combination for variable refrigerant flow multi-split air conditioners and heat pumps certified to standards in terms of IEER as provided at paragraph (a)(3)(ii)(C) of this section, for which consumers would favor lower values shall be greater than or equal to the higher of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample; or,

(*2*) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A to subpart B of part 429). And,

(B) Any represented value of energy efficiency or other measure of energy consumption of a basic model, or of a tested combination for variable refrigerant flow multi-split air conditioners and heat pumps certified to standards in terms of IEER as provided at paragraph (a)(3)(ii)(C) of this section, for which consumers would favor higher values shall be less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample; or,

(*2*) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A to subpart B of part 429).

(iii) For packaged terminal air conditioners and packaged terminal heat pumps, the represented value of cooling capacity shall be the average of the capacities measured for the sample selected as described in (a)(1)(ii) of this section, rounded to the nearest 100 Btu/h.

(2) *Alternative efficiency determination methods.* (i) In lieu of testing, a represented value of efficiency or consumption for a basic model of commercial HVAC equipment must be determined through the application of an AEDM pursuant to the requirements of § 429.70 and the provisions of this section, where:

(A) Any represented value of energy consumption or other measure of energy use of a basic model for which consumers would favor lower values shall be greater than or equal to the output of the AEDM and less than or equal to the Federal standard for that basic model; and

(B) Any represented value of energy efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the output of the AEDM and greater than or equal to the Federal standard for that basic model.

(ii) [Reserved]

(3) *Product-specific provisions for determination of represented values.* (i) Direct-expansion-dedicated outdoor air systems (DX–DOASes):

(A) Individual model selection:

(*1*) Representations for a basic model must be based on the least efficient individual model(s) distributed in commerce among all otherwise comparable model groups comprising the basic model, considering only individual models as provided in paragraph

(a)(3)(i)(A)(*2*) of this section. For the purpose of this paragraph (a)(3), an ''otherwise comparable model group'' means a group of individual models distributed in commerce within the basic model that do not differ in components that affect energy consumption as measured according to the applicable test procedure specified at 10 CFR 431.96 other than those listed in table 1 to paragraph (a)(3)(i)(A) of this section. An otherwise comparable model group may include individual models distributed in commerce with any combination of the components listed in table 1 (or none of the components listed in table 1). An otherwise comparable model group may consist of only one individual model.

(*2*) For a basic model that includes individual models distributed in commerce with components listed in table 1 to paragraph (a)(3)(i)(A) of this section, the requirements for determining representations apply only to the individual model(s) of a specific otherwise comparable model group distributed in commerce with the least number (which could be zero) of components listed in table 1 included in individual models of the group. Testing under this paragraph shall be consistent with any component-specific test provisions specified in section 2.2.2 of appendix B to subpart F of part 431.

TABLE 1 TO PARAGRAPH (a)(3)(i)(A)

| Component | Description |
|---|---|
| Furnaces and Steam/Hydronic Heat Coils | Furnaces and steam/hydronic heat coils used to provide primary or supplementary heating. |
| Ducted Condenser Fans | A condenser fan/motor assembly designed for optional external ducting of condenser air that provides greater pressure rise and has a higher rated motor horsepower than the condenser fan provided as a standard component with the equipment. |
| Sound Traps/Sound Attenuators | An assembly of structures through which the supply air passes before leaving the equipment or through which the return air from the building passes immediately after entering the equipment, for which the sound insertion loss is at least 6 dB for the 125 Hz octave band frequency range. |
| VERS Preheat | Electric resistance, hydronic, or steam heating coils used for preheating outdoor air entering a VERS. |

(B) When certifying, the following provisions apply.

(*1*) For ratings based on tested samples, the represented value of moisture removal capacity shall be between 95 and 100 percent of the mean of the moisture removal capacities measured for the units in the sample selected, as described in paragraph (a)(1)(ii) of this section, rounded to the nearest lb/hr multiple specified in table 2 to paragraph (a)(3)(i)(B) of this section.

(*2*) For ratings based on an AEDM, the represented value of moisture removal capacity shall be the moisture removal capacity output simulated by the AEDM, as described in paragraph (a)(2) of this section, rounded to the nearest lb/hr multiple specified in table 2 to paragraph (a)(3)(i)(B) of this section.

TABLE 2 PARAGRAPH (a)(3)(i)(B)—ROUNDING REQUIREMENTS FOR RATED MOISTURE REMOVAL CAPACITY

| Moisture removal capacity (MRC), lb/hr | Rounding multiples, lb/hr |
|---|---|
| 0 < MRC ≤ 30 | 0.2 |
| 30 < MRC ≤ 60 | 0.5 |
| 60 < MRC ≤ 180 | 1 |
| 180 < MRC | 2 |

(ii) *Variable refrigerant flow multi-split air conditioners and heat pumps (other than air-cooled with cooling capacity less than 65,000 btu/h).* When certifying to standards in terms of IEER, the following provisions apply.

(A) *Outdoor Unit Model Selection.* All representations for basic models of VRF multi-split systems must be based on the least-efficient outdoor unit model(s) distributed in commerce within the basic model.

(B) *Indoor Unit Model Selection.* A manufacturer must determine represented values for basic models of

VRF multi-split systems based on the following provisions regarding selection of indoor units:

(*1*) The combination of indoor unit models shall be selected per the certified tested combination in the STI, subject to the provisions in paragraph (a)(3)(ii)(B)(*2*) of this section.

(*2*) For each indoor unit model identified in the tested combination for which the model number certified in the STI does not fully specify the presence or absence of all components, a fully-specified indoor unit model shall be selected that meets the following qualifications:

(*i*) Is distributed in commerce; and

(*ii*) Has a model number consistent with the certified indoor unit model number (*i.e.*, shares all digits of the model number that are specified in the certified indoor unit model number); and

(*iii*) Among the group of all indoor models meeting the criteria from paragraphs (a)(3)(ii)(B)(*2*)(*i*) and (*ii*) of this section, has the least number (which could be zero) of components listed in Table 2 to paragraph (a)(3)(ii)(B)(*2*) of this section.

TABLE 3 TO PARAGRAPH (a)(3)(ii)(B)(*2*)—SPECIFIC COMPONENTS FOR VARIABLE REFRIGERANT FLOW MULTI-SPLIT SYSTEMS

| Component | Description |
|---|---|
| Air economizers | An automatic system that enables a cooling system to supply and use outdoor air to reduce or eliminate the need for mechanical cooling during mild or cold weather. |
| Dehumidification Components. | An assembly that reduced the moisture content of the supply air through moisture transfer with solid or liquid desiccants. |

(C) *Represented Values for Different Indoor Unit Combinations.* (*1*) If a basic model includes only one type of indoor unit combination (*i.e.*, ducted, non-ducted, or SDHV), a manufacturer must determine the represented values for the basic model in accordance with the sampling plan set forth in § 429.11 and paragraph (a)(1) of this section if the represented values are determined through testing, or in accordance with the provisions for applying an AEDM set forth in paragraph (a)(2) of this section and § 429.70. Indoor unit models must be selected in accordance with paragraph (a)(3)(ii)(B) of this section.

(*2*) If a basic model includes more than one type of indoor unit combination (*i.e.*, ducted, non-ducted, and/or SDHV):

(*i*) A manufacturer must determine separate represented values for each type of indoor unit combination. If the represented values are determined through testing, a manufacturer must test, at a minimum, a single tested combination that represents each type of indoor unit combination included in that basic model. A manufacturer may alternatively determine separate represented values through application of an AEDM as set forth in paragraph (a)(2) of this section and § 429.70. Indoor unit models within the indoor unit combination must be selected in accordance with paragraph (a)(3)(ii)(B) of this section.

(*ii*) A manufacturer may also determine optional ''mixed'' representations by calculating the mean value across any two required representations described in the paragraph (a)(3)(ii)(C)(*2*)(*i*) of this section (*i.e.*, a representation for ''mixed ducted/non-ducted'' would be determined by averaging the ducted representation and the non-ducted representation; a representation for ''mixed ducted/SDHV'' would be determined by averaging the ducted representation and the SDHV representation, and a representation for ''mixed non-ducted/SDHV'' would be determined by averaging the non-ducted representation and the SDHV representation).

(iii) *Single package vertical units.* When certifying to standards in terms of IEER, the following provisions apply.

(A) For individual model selection:

(*1*) Representations for a basic model must be based on the least efficient individual model(s) distributed in commerce among all otherwise comparable model groups comprising the basic model, except as provided in paragraph

(a)(3)(iii)(A)(*2*) of this section for individual models that include components listed in table 4 to this paragraph (a)(3)(iii)(A). For the purpose of this paragraph (a)(3)(iii)(A)(*1*), ''otherwise comparable model group'' means a group of individual models distributed in commerce within the basic model that do not differ in components that affect energy consumption as measured according to the applicable test procedure specified at 10 CFR 431.96 other than those listed in table 4 to this paragraph (a)(3)(iii)(A). An otherwise comparable model group may include individual models distributed in commerce with any combination of the components listed in table 4 (or none of the components listed in table 4). An otherwise comparable model group may consist of only one individual model.

(*2*) For a basic model that includes individual models distributed in commerce with components listed in table 4 to this paragraph (a)(3)(iii)(A), the requirements for determining representations apply only to the individual model(s) of a specific otherwise comparable model group distributed in commerce with the least number (which could be zero) of components listed in table 4 included in individual models of the group. Testing under this paragraph (a)(3)(iii)(A)(*2*) shall be consistent with any component-specific test provisions specified in section 4 of appendix G1 to subpart F of 10 CFR part 431.

TABLE 4 TO PARAGRAPH (a)(3)(iii)(A)—SPECIFIC COMPONENTS FOR SINGLE PACKAGE VERTICAL UNITS

| Component | Description |
|---|---|
| Desiccant Dehumidification Components. | An assembly that reduces the moisture content of the supply air through moisture transfer with solid or liquid desiccants. |
| Air Economizers | An automatic system that enables a cooling system to supply outdoor air to reduce or eliminate the need for mechanical cooling during mid or cold weather. |
| Ventilation Energy Recovery System (VERS). | An assembly that preconditions outdoor air entering the equipment through direct or indirect thermal and/or moisture exchange with the exhaust air, which is defined as the building air being exhausted to the outside from the equipment. |
| Steam/Hydronic Heat Coils | Coils used to provide supplemental heating. |
| Hot Gas Reheat | A heat exchanger located downstream of the indoor coil that heats the Supply Air during cooling operation using high pressure refrigerant in order to increase the ratio of moisture removal to Cooling Capacity provided by the equipment. |
| Fire/Smoke/Isolation Dampers | A damper assembly including means to open and close the damper mounted at the supply or return duct opening of the equipment. |
| Powered Exhaust/Powered Return Air Fans. | A powered exhaust fan is a fan that transfers directly to the outside a portion of the building air that is returning to the unit, rather than allowing it to recirculate to the indoor coil and back to the building. A powered return fan is a fan that draws building air into the equipment. |
| Sound Traps/Sound Attenuators. | An assembly of structures through which the supply air passes before leaving the equipment or through which the return air from the building passes immediately after entering the equipment for which the sound insertion loss is at least 6 dB for the 125 Hz octave band frequency range. |
| Hot Gas Bypass | A method to adjust the cooling delivered by the equipment in which some portion of the hot high-pressure refrigerant from the discharge of the compressor(s) is diverted from its normal flow to the outdoor coil and is instead allowed to enter the indoor coil to modulate the capacity of a refrigeration circuit or to prevent evaporator coil freezing. |

(B) The represented value of cooling capacity must be between 95 percent and 100 percent of the mean of the capacities measured for the units in the sample selected as described in paragraph (a)(1)(ii) of this section, or between 95 percent and 100 percent of the net sensible cooling capacity output simulated by the alternative energy-efficiency determination method (AEDM) as described in paragraph (a)(2) of this section.

(C) Represented values must be based on performance (either through testing or by applying an AEDM) of individual models with components and features that are selected in accordance with section 4 of appendix G1 to subpart F of 10 CFR part 431.

(iv) *Computer room air conditioners.* When certifying to standards in terms of net sensible coefficient of performance (NSenCOP), the following provisions apply.

(A) For individual model selection:

(*1*) Representations for a basic model must be based on the least-efficient individual model(s) distributed in commerce among all otherwise comparable model groups comprising the basic model, except as provided in paragraph (a)(3)(iv)(A)(*2*) of this section for individual models that include components listed in table 5 to paragraph (a)(3)(iv)(A) of this section. For the purpose of this paragraph (a)(3)(iv)(A)(*1*), *otherwise comparable model group* means a group of individual models distributed in commerce within the basic model that do not differ in components that affect energy consumption as measured according to the applicable test procedure specified at 10 CFR 431.96 other than those listed in table 5 to paragraph (a)(3)(iv)(A) of this section. An otherwise comparable model group may include individual models distributed in commerce with any combination of the components listed in table 5 (or none of the components listed in table 5). An otherwise comparable model group may consist of only one individual model.

(*2*) For a basic model that includes individual models distributed in commerce, with components listed in table 5 to paragraph (a)(3)(iv)(A) of this section, the requirements for determining representations apply only to the individual model(s) of a specific otherwise comparable model group distributed in commerce with the least number (which could be zero) of components listed in table 5 to paragraph (a)(3)(iv)(A) included in individual models of the group. Testing under this paragraph (a)(3)(iv)(A)(*2*) shall be consistent with any component-specific test provisions specified in section 4 of appendix E1 to subpart F of 10 CFR part 431.

TABLE 5 TO PARAGRAPH (a)(3)(iv)(A)—SPECIFIC COMPONENTS FOR COMPUTER ROOM AIR CONDITIONERS

| Component | Description |
|---|---|
| Air Economizers | An automatic system that enables a cooling system to supply and use outdoor air to reduce or eliminate the need for mechanical cooling during mild or cold weather. |
| Process Heat Recovery/Reclaim Coils/ Thermal Storage. | A heat exchanger located inside the unit that conditions the equipment's supply air using energy transferred from an external source using a vapor, gas, or liquid. |
| Evaporative Pre-cooling of Air-cooled Condenser Intake Air. | Water is evaporated into the air entering the air-cooled condenser to lower the dry-bulb temperature and thereby increase efficiency of the refrigeration cycle. |
| Steam/Hydronic Heat Coils | Coils used to provide supplemental heat. |
| Refrigerant Reheat Coils | A heat exchanger located downstream of the indoor coil that heats the supply air during cooling operation using high pressure refrigerant in order to increase the ratio of moisture removal to cooling capacity provided by the equipment. |
| Powered Exhaust/Powered Return Air Fans. | A powered exhaust fan is a fan that transfers directly to the outside a portion of the building air that is returning to the unit, rather than allowing it to recirculate to the indoor coil and back to the building. A powered return air fan is a fan that draws building air into the equipment. |
| Compressor Variable Frequency Drive (VFD). | A device connected electrically between the equipment's power supply connection and the compressor that can vary the frequency of power supplied to the compressor in order to allow variation of the compressor's rotational speed. If the manufacturer chooses to make representations for performance at part-load and/or low-ambient conditions, compressor VFDs must be treated consistently for all cooling capacity tests for the basic model (*i.e.,* if the compressor VFD is installed and active for the part-load and/or low-ambient tests, it must also be installed and active for the NSenCOP test). |
| Fire/Smoke/Isolation Dampers | A damper assembly including means to open and close the damper mounted at the supply or return duct opening of the equipment. |
| Non-Standard Indoor Fan Motors | The standard indoor fan motor is the motor specified in the manufacturer's installation instructions for testing and shall be distributed in commerce as part of a particular model. A non-standard motor is an indoor fan motor that is not the standard indoor fan motor and that is distributed in commerce as part of an individual model within the same basic model.<br>For a non-standard indoor fan motor(s) to be considered a specific component for a basic model (and thus subject to the provisions of paragraph (a)(3)(iv)(A) of this section), the following provisions must be met:<br>1. Non-standard indoor fan motor(s) must meet the minimum allowable efficiency determined per section D.2.1 of AHRI 1360–2022 (incorporated by reference, see § 429.4) (*i.e.,* for non-standard indoor fan motors) or per section D.2.2 of AHRI 1360–2022 for non-standard indoor integrated fan and motor combinations). |

TABLE 5 TO PARAGRAPH (a)(3)(iv)(A)—SPECIFIC COMPONENTS FOR COMPUTER ROOM AIR CONDITIONERS—Continued

| Component | Description |
|---|---|
| | If the standard indoor fan motor can vary fan speed through control system adjustment of motor speed, all non-standard indoor fan motors must also allow speed control (including with the use of VFD). |
| Humidifiers | A device placed in the supply air stream for moisture evaporation and distribution. The device may require building steam or water, hot water, electricity, or gas to operate. |
| Flooded Condenser Head Pressure Controls. | An assembly, including a receiver and head pressure control valve, used to allow for unit operation at lower outdoor ambient temperatures than the standard operating control system. |
| Chilled Water Dual Cooling Coils | A secondary chilled water coil added in the indoor air stream for use as the primary or secondary cooling circuit in conjunction with a separate chiller. |
| Condensate Pump | A device used to pump condensate and/or humidifier drain water from inside the unit to a customer drain outside the unit. |

(B) The represented value of net sensible cooling capacity must be between 95 percent and 100 percent of the mean of the capacities measured for the units in the sample selected as described in paragraph (a)(1)(ii) of this section, or between 95 percent and 100 percent of the net sensible cooling capacity output simulated by the AEDM as described in paragraph (a)(2) of this section.

(v) Water-Source Heat Pumps. When certifying to standards in terms of IEER and ACOP, the following provisions apply.

(A) Individual model selection:

*(1)* Representations for a basic model must be based on the least efficient individual model(s) distributed in commerce among all otherwise comparable model groups comprising the basic model, except as provided in paragraph (a)(3)(v)(A)(*2*) of this section for individual models that include components listed in table 6 to paragraph (a)(3)(v)(A) of this section. For the purpose of this paragraph (a)(3)(v)(A)(*1*), ''otherwise comparable model group'' means a group of individual models distributed in commerce within the basic model that do not differ in components that affect energy consumption as measured according to the applicable test procedure specified at 10 CFR 431.96 other than those listed in table 6 to paragraph (a)(3)(v)(A) of this section. An otherwise comparable model group may include individual models distributed in commerce with any combination of the components listed in table 6 (or none of the components listed in table 6) to paragraph (a)(3)(v)(A) of this section. An otherwise comparable model group may consist of only one individual model.

*(2)* For a basic model that includes individual models distributed in commerce with components listed in table 6 to paragraph (a)(3)(v)(A) of this section, the requirements for determining representations apply only to the individual model(s) of a specific otherwise comparable model group distributed in commerce with the least number (which could be zero) of components listed in table 6 to paragraph (a)(3)(v)(A) of this section included in individual models of the group. Testing under this paragraph shall be consistent with any component-specific test provisions specified in section 3 of appendix C1 to subpart F of 10 CFR part 431.

TABLE 6 TO PARAGRAPH (a)(3)(v)(A)—SPECIFIC COMPONENTS FOR WATER SOURCE HEAT PUMPS

| Component | Description |
|---|---|
| Air Economizers | An automatic system that enables a cooling system to supply outdoor air to reduce or eliminate the need for mechanical cooling during mild or cold weather. |
| Condenser Pumps/Valves/Fittings. | Additional components in the water circuit for water control or filtering. |
| Condenser Water Reheat | A heat exchanger located downstream of the indoor coil that heats the supply air during cooling operation using water from the condenser coil in order to increase the ratio of moisture removal to cooling capacity provided by the equipment. |

TABLE 6 TO PARAGRAPH (a)(3)(v)(A)—SPECIFIC COMPONENTS FOR WATER SOURCE HEAT PUMPS—Continued

| Component | Description |
|---|---|
| Desiccant Dehumidification Components. | An assembly that reduces the moisture content of the supply air through moisture transfer with solid or liquid desiccants. |
| Desuperheater | A heat exchanger located downstream of the compressor on the high-pressure vapor line that moves heat to an external source, such as potable water. |
| Fire/Smoke/Isolation Dampers | A damper assembly including means to open and close the damper mounted at the supply or return duct opening of the equipment. |
| Grill Options | Special grills used to direct airflow in unique applications (such as up and away from a rear wall). |
| Indirect/Direct Evaporative Cooling of Ventilation Air. | Water is used indirectly or directly to cool ventilation air. In a direct system the water is introduced directly into the ventilation air and in an indirect system the water is evaporated in secondary air stream and the heat is removed through a heat exchanger. |
| Non-Standard High-Static Indoor Fan Motors. | The standard indoor fan motor is the motor specified in the manufacturer's installation instructions for testing and shall be distributed in commerce as part of a particular model. A non-standard high-static motor is an indoor fan motor that is not the standard indoor fan motor and that is distributed in commerce as part of an individual model within the same basic model.<br>For a non-standard high-static indoor fan motor(s) to be considered a specific component for a basic model (and thus subject to the provisions of paragraph (a)(3)(v)(A)(*2*) of this section), the following 2 provisions must be met:<br>1. Non-standard high-static indoor fan motor(s) must meet the minimum allowable efficiency determined per section D.4.1 of AHRI 600–2023 (incorporated by reference, see § 429.4) for non-standard high-static indoor fan motors, or per section D.4.2 of AHRI 600–2023 for non-standard high-static indoor integrated fan and motor combinations.<br>2. If the standard indoor fan motor can vary fan speed through control system adjustment of motor speed, all non-standard high-static indoor fan motors must also allow speed control (including with the use of a variable-frequency drive). |
| Powered Exhaust/Powered Return Air Fans. | A powered exhaust fan is a fan that transfers directly to the outside a portion of the building air that is returning to the unit, rather than allowing it to recirculate to the indoor coil and back to the building. A powered return fan is a fan that draws building air into the equipment. |
| Process Heat Recovery/Reclaim Coils/Thermal Storage. | A heat exchanger located inside the unit that conditions the equipment's supply air using energy transferred from an external source using a vapor, gas, or liquid. |
| Refrigerant Reheat Coils | A heat exchanger located downstream of the indoor coil that heats the supply air during cooling operation using high-pressure refrigerant in order to increase the ratio of moisture removal to cooling capacity provided by the equipment. |
| Sound Traps/Sound Attenuators. | An assembly of structures through which the supply air passes before leaving the equipment or through which the return air from the building passes immediately after entering the equipment for which the sound insertion loss is at least 6 dB for the 125 Hz octave band frequency range. |
| Steam/Hydronic Heat Coils | Coils used to provide supplemental heating. |
| Ventilation Energy Recovery System (VERS). | An assembly that preconditions outdoor air entering the equipment through direct or indirect thermal and/or moisture exchange with the exhaust air, which is defined as the building air being exhausted to the outside from the equipment. |
| Waterside Economizer | A heat exchanger located upstream of the indoor coil that conditions the supply air when system water loop conditions are favorable so as not to utilize compressor operation. |

(B) The represented value of cooling capacity must be between 95 percent and 100 percent of the mean of the cooling capacities measured for the units in the sample selected as described in paragraph (a)(1)(ii) of this section, or between 95 percent and 100 percent of the cooling capacity output simulated by the AEDM as described in paragraph (a)(2) of this section.

(vi) *Commercial package air conditioning and heating equipment (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h).* Before May 15, 2025, the provisions in 10 CFR 429.43, revised as of January 1, 2024, are applicable. On and after May 15, 2025, when certifying to energy conservation standards in terms of EER or IEER and (as applicable) COP, the provisions in paragraph (a)(3)(vi)(B) of this section apply. When certifying to energy conservation standards in terms of IVEC and (as applicable) IVHE, all provisions in this paragraph (a)(3)(vi) apply.

(A) For individual model selection when certifying to energy conservation standards in terms of IVEC and (as applicable) IVHE:

(*1*) Representations for a basic model must be based on the least-efficient individual model(s) distributed in commerce among all otherwise comparable model groups comprising the basic

model, with selection of the least-efficient individual model considering all options for factory-installed components and manufacturer-supplied components for field installation, except as provided in paragraph (a)(3)(vi)(A)(*2*) of this section for individual models that include components listed in table 7 to paragraph (a)(3)(vi)(A) of this section. For the purpose of this paragraph (a)(3)(vi)(A)(*1*), ''otherwise comparable model group'' means a group of individual models distributed in commerce within the basic model that do not differ in components that affect energy consumption as measured according to the applicable test procedure specified at 10 CFR 431.96 other than those listed in table 7 to paragraph (a)(3)(vi)(A) of this section. An otherwise comparable model group may include individual models distributed in commerce with any combination of the components listed in table 7 (or none of the components listed in table 7). An otherwise comparable model group may consist of only one individual model.

(*2*) For a basic model that includes individual models distributed in commerce with components listed in table 7 to paragraph (a)(3)(vi)(A) of this section, the requirements for determining representations apply only to the individual model(s) of a specific otherwise comparable model group distributed in commerce with the least number (which could be zero) of components listed in table 7 to paragraph (a)(3)(vi)(A) included in individual models of the group. Testing under this paragraph (a)(3)(vi)(A)(*2*) shall be consistent with any component-specific test provisions specified in section 6 of appendix A1 to subpart F of 10 CFR part 431.

TABLE 7 TO PARAGRAPH (a)(3)(vi)(A)—SPECIFIC COMPONENTS FOR COMMERCIAL PACKAGE AIR CONDITIONING AND HEATING EQUIPMENT

[Excluding air-cooled equipment with a cooling capacity of less than 65,000 Btu/h]

| Component | Description |
|---|---|
| Air Economizers | An automatic system that enables a cooling system to supply outdoor air to reduce or eliminate the need for mechanical cooling during mild or cold weather. |
| Desiccant Dehumidification Components | An assembly that reduces the moisture content of the supply air through moisture transfer with solid or liquid desiccants. |
| Evaporative Pre-cooling of Air-cooled Condenser Intake Air. | Water is evaporated into the air entering the air-cooled condenser to lower the dry-bulb temperature and thereby increase efficiency of the refrigeration cycle. |
| Fire/Smoke/Isolation Dampers | A damper assembly including means to open and close the damper mounted at the supply or return duct opening of the equipment. |
| Indirect/Direct Evaporative Cooling of Ventilation Air | Water is used indirectly or directly to cool ventilation air. In a direct system, the water is introduced directly into the ventilation air, and in an indirect system, the water is evaporated in secondary air stream, and the heat is removed through a heat exchanger. |
| Non-Standard Ducted Condenser Fans (not applicable to Double-duct Systems). | A higher-static condenser fan/motor assembly designed for external ducting of condenser air that provides greater pressure rise and has a higher rated motor horsepower than the condenser fan provided as a standard component with the equipment. |
| Non-Standard High-Static Indoor Fan Motors | The standard indoor fan motor is the motor specified in the manufacturer's installation instructions for testing and shall be distributed in commerce as part of a particular model. A non-standard motor is an indoor fan motor that is not the standard indoor fan motor and that is distributed in commerce as part of an individual model within the same basic model.<br>For a non-standard high-static indoor fan motor(s) to be considered a specific component for a basic model (and thus subject to the provisions of paragraph (a)(3)(vi)(A)(*2*) of this section), the following provisions must be met:<br>(1) Non-standard high-static indoor fan motor(s) must meet the minimum allowable efficiency determined per section D.3.1 of AHRI 1340–2023 (incorporated by reference, see §429.4) for non-standard high-static indoor fan motors or per section D.3.2 of AHRI 1340–2023 for non-standard high-static indoor integrated fan and motor combinations.<br>(2) If the standard indoor fan motor can vary fan speed through control system adjustment of motor speed, all non-standard high-static indoor fan motors must also allow speed control (including with the use of variable-frequency drive). |
| Powered Exhaust/Powered Return Air Fans | A powered exhaust fan is a fan that transfers directly to the outside a portion of the building air that is returning to the unit, rather than allowing it to recirculate to the indoor coil and back to the building. A powered return fan is a fan that draws building air into the equipment. |
| Process Heat recovery/Reclaim Coils/Thermal Storage | A heat exchanger located inside the unit that conditions the equipment's supply air using energy transferred from an external source using a vapor, gas, or liquid. |
| Refrigerant Reheat Coils | A heat exchanger located downstream of the indoor coil that heats the supply air during cooling operation using high pressure refrigerant in order to increase the ratio of moisture removal to cooling capacity provided by the equipment. |
| Sound Traps/Sound Attenuators | An assembly of structures through which the supply air passes before leaving the equipment or through which the return air from the building passes immediately after entering the equipment for which the sound insertion loss is at least 6 dB for the 125 Hz octave band frequency range. |
| Steam/Hydronic Heat Coils | Coils used to provide supplemental heating. |
| Ventilation Energy Recovery System (VERS) | An assembly that preconditions outdoor air entering the equipment through direct or indirect thermal and/or moisture exchange with the exhaust air, which is defined as the building air being exhausted to the outside from the equipment. |

(B) The represented value of total cooling capacity must be between 95 percent and 100 percent of the mean of the total cooling capacities measured for the units in the sample selected as described in paragraph (a)(1)(ii) of this section, or between 95 percent and 100 percent of the total cooling capacity output simulated by the AEDM as described in paragraph (a)(2) of this section.

(C) Representations of IVEC and IVHE (including $IVHE_c$, as applicable) must be determined using a minimum part-load airflow that is no lower than the highest of the following:

(*1*) The minimum part-load airflow obtained using the as-shipped system control settings;

(*2*) The minimum part-load airflow obtained using the default system control settings specified in the manufacturer installation instructions (as applicable); and

(*3*) The minimum airflow rate specified in section 5.18.2 of AHRI 1340–2023.

(b) *Certification reports.* (1) The requirements of §429.12 are applicable to commercial HVAC equipment; and

(2) Pursuant to §429.12(b)(13), a certification report must include the following public equipment-specific information:

(i) Commercial package air-conditioning equipment (except commercial package air conditioning equipment that is air-cooled with a cooling capacity less than 65,000 Btu/h):

(A) When certifying compliance with an EER standard: the energy efficiency ratio (EER in British thermal units per Watt-hour (Btu/Wh)), the rated cooling capacity in British thermal units per hour (Btu/h), and the type(s) of heating used by the basic model (*e.g.*, electric, gas, hydronic, none).

(B) When certifying compliance with an IEER standard: the integrated energy efficiency ratio (IEER in British thermal units per Watt-hour (Btu/Wh)), the rated cooling capacity in British thermal units per hour (Btu/h), and the type(s) of heating used by the basic model (*e.g.*, electric, gas, hydronic, none).

(ii) Commercial package heating equipment (except commercial package heating equipment that is air-cooled with a cooling capacity less than 65,000 Btu/h):

(A) When certifying compliance with an EER standard: the energy efficiency ratio (EER in British thermal units per Watt-hour (Btu/Wh)), the coefficient of performance (COP), the rated cooling capacity in British thermal units per hour (Btu/h), and the type(s) of heating used by the basic model (*e.g.*, electric, gas, hydronic, none).

(B) When certifying compliance an IEER standard: the integrated energy efficiency ratio (IEER in British thermal units per Watt-hour (Btu/Wh)), the coefficient of performance (COP), the rated cooling capacity in British thermal units per hour (Btu/h), and the type(s) of heating used by the basic model (*e.g.*, electric, gas, hydronic, none).

(iii) Packaged terminal air conditioners: The energy efficiency ratio (EER in British thermal units per Watt-hour (Btu/Wh)), the rated cooling capacity in British thermal units per hour (Btu/h), the wall sleeve dimensions in inches (in), and the duration of the break-in period (hours).

(iv) Packaged terminal heat pumps: The energy efficiency ratio (EER in British thermal units per Watt-hour (Btu/W-h)), the coefficient of performance (COP), the rated cooling capacity in British thermal units per hour (Btu/h), the wall sleeve dimensions in inches (in), and the duration of the break-in period (hours).

(v) Single package vertical air conditioners:

(A) When certifying compliance with an EER standard: The energy efficiency ratio (EER in British thermal units per Watt-hour (Btu/Wh)), and the rated cooling capacity in British thermal units per hour (Btu/h).

(B) When certifying compliance with an IEER standard: the integrated energy efficiency ratio (IEER in British thermal units per Watt-hour (Btu/Wh)), the rated cooling capacity in British thermal units per hour (Btu/h), and the rated airflow in standard cubic feet per minute (SCFM). For units with rated cooling capacity <65,000 Btu/h: whether the unit is weatherized or non-weatherized; and if non-weatherized, the airflow rate of outdoor ventilation air which is drawn in and conditioned as

determined in accordance with § 429.134(x)(3), while the equipment is operating with the same drive kit and motor settings used to determine the certified efficiency rating of the equipment.

(vi) Single package vertical heat pumps:

(A) When certifying compliance with an EER standard: the energy efficiency ratio (EER in British thermal units per Watt-hour (Btu/Wh)), and the coefficient of performance (COP), and the rated cooling capacity in British thermal units per hour (Btu/h).

(B) When certifying compliance with an IEER standard: the integrated energy efficiency ratio (IEER in British thermal units per Watt-hour (Btu/Wh)), and the coefficient of performance (COP), the rated cooling capacity in British thermal units per hour (Btu/h), and the rated airflow in standard cubic feet per minute (SCFM). For units with cooling capacity <65,000 Btu/h: whether the unit is weatherized or non-weatherized; and if non-weatherized, the airflow rate of outdoor ventilation air which is drawn in and conditioned as determined in accordance with § 429.134(x)(3), while the equipment is operating with the same drive kit and motor settings used to determine the certified efficiency rating of the equipment.

(vii) Variable refrigerant flow multi-split air-cooled air conditioners (other than air-cooled with rated cooling capacity less than 65,000 btu/h):

(A) When certifying compliance with an EER standard: The energy efficiency ratio (EER in British thermal units per Watt-hour (Btu/Wh)), rated cooling capacity in British thermal units per hour (Btu/h), and the type(s) of heating used by the basic model (e.g., electric, gas, hydronic, none).

(B) When certifying compliance with an IEER standard, the following must be certified for each tested combination as required under paragraph (a)(3)(ii)(C) of this section: The integrated energy efficiency ratio (IEER) in British thermal units per Watt-hour (Btu/Wh)); the rated cooling capacity in British thermal units per hour (Btu/h); whether the represented values are for a non-ducted, ducted, or SDHV tested combination, or for a mixed representation of any two of the tested combinations; and the outdoor unit(s) and indoor units identified in the tested combination. The following must be certified for each basic model: the type(s) of heating used (*i.e.*, electric, gas, hydronic, none); and the refrigerant used to determine the represented values.

(viii) Variable refrigerant flow multi-split heat pumps (other than air-cooled with rated cooling capacity less than 65,000 btu/h):

(A) When certifying compliance with an EER standard: The energy efficiency ratio (EER in British thermal units per Watt-hour (Btu/Wh)), the coefficient of performance (COP), rated cooling capacity in British thermal units per hour (Btu/h), and the type(s) of heating used by the basic model (e.g., electric, gas, hydronic, none).

(B) When certifying compliance with an IEER standard, the following must be certified for each tested combination as required under paragraph (a)(3)(ii)(C) of this section: The integrated energy efficiency ratio (IEER) in British thermal units per Watt-hour (Btu/Wh); the coefficient of performance (COP); the rated cooling capacity in British thermal units per hour (Btu/h); the rated heating capacity (Btu/h); whether the represented values are for a non-ducted, ducted, or SDHV tested combination, or for a mixed representation of any two of the tested combinations; and the outdoor unit(s) and indoor units identified in the tested combination. The following must be certified for each basic model: the type(s) of heating used (*i.e.*, electric, gas, hydronic, none); and the refrigerant used to determine the represented values.

(ix) Computer room air-conditioners:

(A) When certifying compliance with a SCOP standard: The net sensible cooling capacity in British thermal units per hour (Btu/h), the net cooling capacity in British thermal units per hour (Btu/h), the configuration (upflow/downflow), economizer presence (yes or no), condenser medium (air, water, or glycol-cooled), sensible coefficient of performance (SCOP), and rated airflow in standard cubic feet per minute (SCFM).

(B) When certifying compliance with an NSenCOP standard: The net sensible cooling capacity in British thermal units per hour (Btu/h), the net total cooling capacity in British thermal units per hour (Btu/h), whether the basic model is split system or single-package, the configuration (downflow, upflow ducted, upflow non-ducted, horizontal flow, ceiling-mounted ducted, ceiling-mounted non-ducted), fluid economizer presence (yes or no), condenser heat rejection medium (air, water, or glycol-cooled), net sensible coefficient of performance (NSenCOP), rated airflow in standard cubic feet per minute (SCFM), and the refrigerant used to determine the represented values.

(x) Water source heat pumps (other than variable refrigerant flow): The energy efficiency ratio (EER in British thermal units per Watt-hour (Btu/Wh)), the coefficient of performance (COP), the rated cooling capacity in British thermal units per hour (Btu/h), and the type(s) of heating used by the basic model (e.g., electric, gas, hydronic, none).

(xi) Direct-expansion dedicated outdoor air systems:

(A) When certifying compliance with an ISMRE2 standard: the integrated seasonal moisture removal efficiency 2 (ISMRE2 in lbs. of moisture per kilowatt-hour (lb/kWh)), the rated moisture removal capacity at Standard Rating Condition A according to appendix B to subpart F of part 431 of this chapter (MRC in lbs of moisture per hour (lb/h)), and the rated supply airflow rate for 100 percent outdoor air applications ($Q_{SA}$ in standard cubic feet per minute).

(B) When certifying compliance with an ISCOP2 standard: the integrated seasonal coefficient of performance 2 (ISCOP2 in Watts of heating per Watts of power input (W/W)).

(C) The configuration of the basic model number (*i.e.*, ''single-package'' or ''split system'') shall also be provided.

(3) Pursuant to § 429.12(b)(13), a certification report must include the following additional equipment-specific information:

(i) Whether the basic model is engineered-to-order; and

(ii) For any basic model rated with an AEDM, whether the manufacturer elects the witness test option for verification testing. (See § 429.70(c)(5)(iii) for options). However, the manufacturer may not select more than 10% of AEDM-rated basic models.

(iii) For direct-expansion dedicated outdoor air systems with ventilation energy recovery systems, method of determination of the exhaust air transfer ratio (EATR), sensible effectiveness, and latent effectiveness of the ventilation energy recovery system (name and version of certified performance modeling software or if the device was directly tested). The test method (*i.e.*, Option 1 or Option 2) for units rated based on testing and motor control settings (including rotational speed) for energy recovery wheels shall also be provided.

(4) Pursuant to § 429.12(b)(13), a certification report must include supplemental information submitted in PDF format. The equipment-specific, supplemental information must include any additional testing and testing set up instructions (*e.g.*, charging instructions) for the basic model; identification of all special features that were included in rating the basic model; and all other information (*e.g.*, operational codes or component settings) necessary to operate the basic model under the required conditions specified by the relevant test procedure. A manufacturer may also include with a certification report other supplementary items in PDF format (*e.g.*, manuals) for DOE consideration in performing testing under subpart C of this part. The equipment-specific, supplemental information must include at least the following:

(i) Commercial package air-conditioning equipment (except commercial package air conditioning equipment that is air-cooled with a cooling capacity less than 65,000 Btu/h): rated indoor airflow in standard cubic feet per minute (SCFM) for each fan coil; water flow rate in gallons per minute (gpm) for water-cooled units only; rated external static pressure in inches of water; frequency or control set points for variable speed components (*e.g.*, compressors, VFDs); required dip

switch/control settings for step or variable components; a statement whether the model will operate at test conditions without manufacturer programming; any additional testing instructions, if applicable; and if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating. When certifying compliance with an IEER standard, rated indoor airflow in SCFM for each part-load point used in the IEER calculation and any special instructions required to obtain operation at each part-load point, such as frequency or control set points for variable speed components (*e.g.*, compressors, VFDs), dip switch/control settings for step or variable components, or any additional applicable testing instructions, are also required.

(ii) Commercial package heating equipment (except commercial package heating equipment that is air-cooled with a cooling capacity less than 65,000 Btu/h): The rated heating capacity in British thermal units per hour (Btu/h); rated indoor airflow in standard cubic feet per minute (SCFM) for each fan coil (in cooling mode); rated airflow in SCFM for each fan coil in heating mode if the unit is designed to operate with different airflow rates for cooling and heating mode; water flow rate in gallons per minute (gpm) for water cooled units only; rated external static pressure in inches of water; frequency or control set points for variable speed components (*e.g.*, compressors, VFDs); required dip switch/control settings for step or variable components; a statement whether the model will operate at test conditions without manufacturer programming; any additional testing instructions, if applicable; and if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating. When certifying compliance with an IEER standard, rated indoor airflow in SCFM for each part-load point used in the IEER calculation and any special instructions required to obtain operation at each part-load point, such as frequency or control set points for variable speed components (*e.g.*, compressors, VFDs), dip switch/control settings for step or variable components, or any additional applicable testing instructions, are also required.

(iii) Variable refrigerant flow multi-split air-cooled air conditioners (other than air-cooled with rated cooling capacity less than 65,000 btu/h):

(A) When certifying compliance with an EER standard: The nominal cooling capacity in British thermal units per hour (Btu/h); outdoor unit(s) and indoor units identified in the tested combination; components needed for heat recovery, if applicable; rated airflow in standard cubic feet per minute (scfm) for each indoor unit; rated static pressure in inches of water; compressor frequency setpoints; required dip switch/control settings for step or variable components; a statement whether the model will operate at test conditions without manufacturer programming; any additional testing instructions if applicable; if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating; and which, if any, special features were included in rating the basic model. Additionally, upon DOE request, the manufacturer must provide a layout of the system set-up for testing including charging instructions consistent with the installation manual.

(B) When certifying compliance with an IEER standard (for requirements in this list pertaining to or affected by indoor units, the requirements must be certified for each tested combination as required under paragraph

(a)(3)(ii)(C) of this section): The nominal cooling capacity in British thermal units per hour (Btu/h) for each indoor and outdoor unit; identification of the indoor units to be thermally active for each IEER test point; the rated indoor airflow for the full-load cooling and all part-load cooling tests (for each indoor unit) in standard cubic feet per minute (scfm); the indoor airflow-control setting to be used in the full-load cooling test (for each indoor unit); system start-up or initialization procedures, including conditions and duration; compressor break-in period duration of 20 hours or less; the frequency of oil recovery cycles; operational settings for all critical parameters to be controlled at each of the four IEER cooling test conditions; all dip switch/control settings used for the full-load cooling test; identification of any system control device required for testing; a hierarchy of instructions for adjustment of critical parameters to reduce cooling capacity during IEER cooling tests (to be used if, using initial critical parameter settings, the measured cooling capacity is more than 3 percent above the target cooling capacity); any additional testing instructions if applicable; and if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating. Instructions for conducting a controls verification procedure (as described in Appendix C of AHRI 1230–2021, (incorporated by reference, *see* § 429.4) at each of the four IEER cooling test conditions must also be provided, including: the required thermostat setpoints to ensure control for 80 °F dry-bulb temperature when accounting for setpoint bias, the starting indoor dry-bulb temperature, and the indoor dry-bulb temperature ramp rate (R2). Additionally, the manufacturer must provide a layout of the system set-up for testing (including a piping diagram, a power wiring diagram, a control wiring diagram, and identification of the location of the component(s) corresponding to each critical parameter to be controlled), set-up instructions for indoor units and outdoor units, and charging instructions consistent with the installation manual.

(iv) Variable refrigerant flow multi-split heat pumps (other than air-cooled with rated cooling capacity less than 65,000 btu/h):

(A) When certifying compliance with an EER standard: The nominal cooling capacity in British thermal units per hour (Btu/h); rated heating capacity in British thermal units per hour (Btu/h); outdoor unit(s) and indoor units identified in the tested combination; components needed for heat recovery, if applicable; rated airflow in standard cubic feet per minute (scfm) for each indoor unit; water flow rate in gallons per minute (gpm) for water-cooled units only; rated static pressure in inches of water; compressor frequency setpoints; required dip switch/control settings for step or variable components; a statement whether the model will operate at test conditions without manufacturer programming; any additional testing instructions if applicable; if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating; and which, if any, special features were included in rating the basic model. Additionally, upon DOE request, the manufacturer must provide a layout of the system set-up for testing including charging instructions consistent with the installation manual.

(B) When certifying compliance with an IEER standard (for requirements in this list pertaining to or affected by indoor units, the requirements must be certified for each tested combination as required under paragraph (a)(3)(ii)(C) of this section): The nominal cooling capacity in British thermal units per hour (Btu/h) for each indoor and outdoor unit; the nominal heating capacity (Btu/h) for each indoor and outdoor unit; components needed for

heat recovery, if applicable; identification of the indoor units to be thermally active for each IEER test point; the rated indoor airflow for the full-load cooling, full-load heating, and all part-load cooling tests (for each indoor unit) in standard cubic feet per minute (scfm); the indoor airflow-control setting to be used in the full-load cooling test (for each indoor unit); the airflow-control setting to be used in the full-load heating test (for each indoor unit); for water-cooled units—the rated water flow rate in gallons per minute (gpm); system start-up or initialization procedures, including conditions and duration; compressor break-in period duration of 20 hours or less; the frequency of oil-recovery cycles; operational settings for all critical parameters to be controlled at each of the four IEER cooling test conditions; operational settings for all critical parameters to be controlled for the heating test; all dip switch/control settings used for the full-load cooling and full-load heating tests; identification of any system control device required for testing; a hierarchy of instructions for adjustment of critical parameters to reduce cooling capacity during IEER cooling tests (to be used if, using initial critical parameter settings, the measured cooling capacity is more than 3 percent above the target cooling capacity); any additional testing instructions if applicable; and if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating. Instructions for conducting a controls verification procedure (as described in Appendix C of AHRI 1230–2021) at each of the four IEER cooling test conditions must also be provided, including the required thermostat setpoints to ensure control for 80 °F dry-bulb temperature when accounting for setpoint bias, the starting indoor dry-bulb temperature, and the indoor dry-bulb temperature ramp rate (R2). Additionally, the manufacturer must provide a layout of the system set-up for testing (including a piping diagram, a power wiring diagram, a control wiring diagram, and identification of the location of the component(s) corresponding to each critical parameter to be adjusted), set-up instructions for indoor units and outdoor units, and charging instructions consistent with the installation manual.

(v) Water source heat pumps: The nominal cooling capacity in British thermal units per hour (Btu/h); rated heating capacity in British thermal units per hour (Btu/h); rated airflow in standard cubic feet per minute (SCFM) for each indoor unit; water flow rate in gallons per minute (gpm); rated static pressure in inches of water; refrigerant charging instructions, (e.g., refrigerant charge, superheat and/or subcooling temperatures); frequency set points for variable speed components (e.g., compressors, VFDs), including the required dip switch/control settings for step or variable components; a statement whether the model will operate at test conditions without manufacturer programming; any additional testing instructions if applicable; if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating; and which, if any, special features were included in rating the basic model.

(vi) Single package vertical air-conditioners:

(A) When certifying compliance with an EER standard: Any additional testing instructions, if applicable; if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating; and which, if any, special features were included in rating the basic model.

(B) When certifying compliance with an IEER standard: Compressor break-in period duration; rated indoor airflow in standard cubic feet per minute (SCFM); frequency or control set points including the required dip switch/control settings for step or variable-speed components (*e.g.*, compressors, VFDs); rated indoor airflow in SCFM for each part-load point used in the IEER calculation and any special instructions required to obtain operation at each part-load point, such as frequency or control set points including dip switch/control settings for step or variable-speed components (*e.g.*, compressors, VFDs); a statement whether the model will operate at test conditions without manufacturer programming; outdoor air-side attachments used for testing; any additional testing instructions, if applicable; and if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating; any additional applicable testing instructions, are also required.

(vii) Single package vertical heat pumps:

(A) *When certifying compliance with an EER standard:* Any additional testing instructions, if applicable; if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating; and which, if any, special features were included in rating the basic model.

(B) *When certifying compliance with an IEER standard:* The rated heating capacity in British thermal units per hour (Btu/h); compressor break-in period duration; rated indoor airflow in standard cubic feet per minute (SCFM) (in cooling mode); rated airflow in SCFM in heating mode if the unit is designed to operate with different airflow rates for cooling and heating mode; frequency or control set points including the required dip switch/control settings for step or variable-speed components (*e.g.*, compressors, VFDs); rated indoor airflow in SCFM for each part-load point used in the IEER calculation and any special instructions required to obtain operation at each part-load point, such as frequency or control set points including dip switch/control settings for step or variable-speed components (*e.g.*, compressors, VFDs); a statement whether the model will operate at test conditions without manufacturer programming; outdoor air-side attachments used for testing; any additional testing instructions, if applicable; and if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating; or any additional applicable testing instructions, are also required.

(viii) *Computer room air-conditioners:*

(A) *When certifying compliance with a SCOP standard:* Any additional testing instructions, if applicable; and which, if any, special features were included in rating the basic model.

(B) *When certifying compliance with a NSenCOP standard:* Compressor break-in period duration; frequency or control set points including the required dip switch/control settings for step or variable-speed components (*e.g.*, compressors, VFDs); a statement whether the model will operate at test conditions without manufacturer programming; any additional testing instructions, if applicable; if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating.

(ix) Package terminal air conditioners and package terminal heat pumps: Any additional testing instructions, if applicable.

(x) *Direct-expansion dedicated outdoor air systems:*

(A) *For units without ventilation energy recovery systems:* water flow rate in gallons per minute (gpm) for water-cooled and water-source units; rated ESP in inches of water column for the supply air stream; frequency or control set points for variable-speed components (*e.g.*, compressors, VFDs); required dip switch/control settings for step or variable-speed components (*e.g.*, reheat or head pressure control valves); a statement whether the model will operate at test conditions without manufacturer programming; if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating; and any additional testing instructions specified in appendix B to subpart F of part 431 of this chapter, if applicable (*e.g.*, supply air dry-bulb temperatures for ISMRE2 tests, equipment settings for airflow, installation priority for split-system units, defrost control settings for air-source heat pump units, break-in period, or condenser head pressure controls.

(B) *For units with ventilation energy recovery systems*, the requirements in paragraph (b)(4)(x)(A) of this section apply, in addition to: rated ESP in inches of water column for the return air stream; exhaust air transfer ratio at the rated supply airflow rate and a neutral pressure difference between return and supply airflow (EATR as a percent value); sensible and latent effectiveness of the ventilation energy recovery system at 75 percent of the nominal supply airflow and zero pressure differential in accordance with the DOE test procedure in appendix B to subpart F of part 431 of this chapter; sensible and latent effectiveness of the ventilation energy recovery system at 100 percent of the nominal supply airflow and zero pressure differential in accordance with the DOE test procedure in appendix B to subpart F of part 431 of this chapter; and any additional testing instructions, if applicable (*e.g.*, deactivation of VERS or VERS bypass in accordance with appendix B to subpart F of part 431 of this chapter).

(5) For variable refrigerant flow multi-split air conditioners and heat pumps (other than air-cooled with rated cooling capacity less than 65,000 btu/h), if a manufacturer has knowledge that any of its certified operational settings for critical parameters to be controlled during IEER tests (per paragraph (b)(4)(vii)(B) or (b)(4)(viii)(B) of this section) are invalid according to the results of a controls verification procedure conducted according to § 429.134(v)(3), then the manufacturer must re-rate and re-certify using valid operational settings for critical parameters for all affected basic models.

(6) *Basic and individual model numbers.* The basic model number and individual model number(s) required to be reported under § 429.12(b)(6) must consist of the following:

(i) *For computer room air-conditioners:*

TABLE 8 TO PARAGRAPH (b)(6)(i)

| Single-package or split system? | Basic model No. | Individual model No(s). | |
|---|---|---|---|
| | | 1 | 2 |
| Single-Package | Number unique to the basic model | Package | N/A. |
| Split System | Number unique to the basic model | Indoor Unit | Outdoor Unit. |

(ii) *For direct-expansion dedicated outdoor air systems:*

TABLE 9 TO PARAGRAPH (b)(6)(ii)

| Equipment configuration | Basic model No. | Individual model No(s). | |
|---|---|---|---|
| | | 1 | 2 |
| Single-Package | Number unique to the basic model | Package | N/A. |
| Split System | Number unique to the basic model | Outdoor Unit | Indoor Unit. |

(c) Alternative methods for determining efficiency or energy use for commercial HVAC equipment can be found in § 429.70 of this subpart.

[76 FR 12451, Mar. 7, 2011; 76 FR 24775, May 2, 2011, as amended at 78 FR 79594, Dec. 31, 2013; 79 FR 25501, May 5, 2014; 80 FR 151, Jan. 5, 2015; 80 FR 37147, June 30, 2015; 80 FR 79668, Dec. 23, 2015; 87 FR 45195, July 27, 2022; 87 FR 63892, Oct. 20, 2022; 87 FR 65667, Nov. 1, 2022; 87 FR 75166, Dec. 7, 2022; 87 FR 77317, Dec. 16, 2022; 88 FR 21836, Apr. 11, 2023; 88 FR 84226, Dec.4, 2023; 89 FR 44033, May 20, 2024; 89 FR 82064, Oct. 9, 2024]

### § 429.44 Commercial water heating equipment.

(a) For residential-duty commercial water heaters, all represented values must be determined in accordance with § 429.17.

(b) *Determination of represented values for all types of commercial water heaters except residential-duty commercial water heaters.* Manufacturers must determine the represented values, which includes the certified ratings, for each basic model of commercial water heating equipment except residential-duty commercial water heaters, either by testing, in conjunction with the applicable sampling provisions, or by applying an AEDM as set forth in § 429.70.

(1) *Units to be tested.* If the represented value for a given basic model is determined through testing:

(i) The general requirements of § 429.11 apply; and

(ii) A sample of sufficient size must be randomly selected and tested to ensure that:

(A) Any represented value of energy consumption or other measure of energy use of a basic model for which consumers would favor lower values must be greater than or equal to the higher of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the ith sample; or,

(*2*) The upper 95-percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95-percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A to subpart B of this part). And,

(B) Any represented value of energy efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values must be less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the ith sample; or,

(*2*) The lower 95-percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95-percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A to subpart B of this part).

(2) *Alternative efficiency determination methods*. In lieu of testing, a represented value of efficiency or consumption for a basic model must be determined through the application of an AEDM pursuant to the requirements of § 429.70 and the provisions of this section, where:

(i) Any represented value of energy consumption or other measure of energy use of a basic model for which consumers would favor lower values must be greater than or equal to the output of the AEDM and less than or equal to the Federal standard for that basic model; and

(ii) Any represented value of energy efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values must be less than or equal to the output of the AEDM and greater than or equal to the Federal standard for that basic model.

(3) *Rated input*. The rated input for a basic model reported in accordance with paragraph (c)(2) of this section must be the maximum rated input listed on the nameplate for that basic model.

(c) *Certification reports*. For commercial water heating equipment other than residential-duty commercial water heaters:

(1) The requirements of § 429.12 apply; and

(2) Pursuant to § 429.12(b)(13), a certification report must include the following public equipment-specific information:

(i) *Commercial electric storage water heaters with measured storage volume less than or equal to 140 gallons:* The standby loss in percent per hour (%/h); whether the rated input rate is greater than 12kW (Yes/No); whether the ratio of input rate per gallon of stored water is less than 4,000 Btu/h/gallon (Yes/No); and the measured storage volume in gallons (gal).

(ii) *Commercial gas-fired and oil-fired storage water heaters with rated storage volume less than or equal to 140 gallons:* The thermal efficiency in percent (%), the standby loss in British thermal units per hour (Btu/h), the rated storage volume in gallons (gal), and the rated input in British thermal units per hour (Btu/h).

(iii) *Commercial water heaters and hot water supply boilers with storage capacity greater than 140 gallons:*

(A) *For gas-fired and oil-fired units:* The thermal efficiency in percent (%); whether the rated storage volume is greater than 140 gallons (Yes/No); whether the tank surface area is insulated with at least R–12.5 (Yes/No); whether a standing pilot light is used (Yes/No); whether the basic model has a fire damper or fan-assisted combustion (Yes/No); and, if applicable, pursuant to § 431.110 of this chapter, the standby loss in British thermal units per hour (Btu/h); the rated storage volume in gallons (gal); and the rated

input in British thermal units per hour (Btu/h).

(B) *For electric units:* whether the rated storage volume is greater than 140 gallons (Yes/No); whether the tank surface area is insulated with at least R–12.5 (Yes/No); whether the rated input is greater than 12kW (Yes/No); whether the ratio of input rate per gallon of stored water is less than 4,000 Btu/h (Yes/No); and, if applicable, pursuant to § 431.110 of this chapter, the standby loss in percent per hour (%/h); and the measured storage volume in gallons (gal).

(iv) *Commercial gas-fired and oil-fired instantaneous water heaters with rated storage volume greater than or equal to 10 gallons and gas-fired and oil-fired hot water supply boilers with rated storage volume greater than or equal to 10 gallons:* The thermal efficiency in percent (%); the standby loss in British thermal units per hour (Btu/h); the rated storage volume in gallons (gal); the rated input in British thermal units per hour (Btu/h); whether the water heater includes a storage tank with a storage volume greater than or equal to 10 gallons (Yes/No). For equipment that does not meet the definition of storage-type instantaneous water heaters (as set forth in 10 CFR 431.102), in addition to the requirements discussed previously in this paragraph (c)(2)(iv), the following must also be included in the certification report: whether the measured storage volume is determined using weight-based test in accordance with § 431.106 of this chapter or the calculation-based method in accordance with § 429.72; whether the water heater will initiate main burner operation based on a temperature-controlled call for heating that is internal to the water heater (Yes/No); whether the water heater is equipped with an integral pump purge functionality (Yes/No); if the water heater is equipped with integral pump purge, the default duration of the pump off delay (minutes).

(v) *Commercial gas-fired and oil-fired instantaneous water heaters with rated storage volume less than 10 gallons and gas-fired and oil-fired hot water supply boilers with rated storage volume less than 10 gallons:* The thermal efficiency in percent (%); the rated storage volume in gallons (gal), the rated input in British thermal units per hour (Btu/h); and whether the measured storage volume is determined using weight-based test in accordance with § 431.106 of this chapter or the calculation-based method in accordance with § 429.72.

(vi) *Commercial electric instantaneous water heaters with measured storage volume greater than or equal to 10 gallons (excluding storage-type instantaneous water heaters with storage capacity greater than 140 gallons):* The thermal efficiency in percent (%); the standby loss in percent per hour (%/h); whether the rated input is greater than 12kW (Yes/No); whether the ratio of input rate per gallon of stored water is not less than 4,000 Btu/h (Yes/No);the measured storage volume in gallons (gal); and whether the water heater includes a storage tank with a storage volume greater than or equal to 10 gallons (Yes/No). For equipment that does not meet the definition of ''storage-type instantaneous water heater'' (as set forth in § 431.102 of this chapter), the following must also be included in the certification report: whether the measured storage volume is determined using a weight-based test in accordance with § 431.106 of this chapter or the calculation-based method in accordance with § 429.72; whether the water heater will initiate heating element operation based on a temperature-controlled call for heating that is internal to the water heater (Yes/No); whether the water heater is equipped with an integral pump purge functionality (Yes/No); and if the water heater is equipped with integral pump purge, the default duration of the pump off delay (minutes).

(vii) *Commercial electric instantaneous water heaters with measured storage volume less than 10 gallons:* The thermal efficiency in percent (%); whether the rated input is greater than 12kW (Yes/No); whether the ratio of input rate per gallon of stored water is not less than 4,000 Btu/h (Yes/No); the measured storage volume in gallons (gal); and whether the measured storage volume is determined using a weight-based test in accordance with § 431.106 of this chapter or the calculation-based method in accordance with § 429.72.

(viii) *Commercial unfired hot water storage tanks:* The thermal insulation (*i.e.*, R-value) and stored volume in gallons (gal).

(3) Pursuant to § 429.12(b)(13), a certification report must include the following additional, equipment-specific information:

(i) Whether the basic model is engineered-to-order; and

(ii) For any basic model rated with an AEDM, whether the manufacturer elects the witness test option for verification testing. (See § 429.70(c)(5)(iii) for options.) However, the manufacturer may not select more than 10 percent of AEDM-rated basic models to be eligible for witness testing.

(4) Pursuant to § 429.12(b)(13), a certification report may include supplemental testing instructions in PDF format. If necessary to run a valid test, the equipment-specific, supplemental information must include any additional testing and testing set-up instructions (e.g., whether a bypass loop was used for testing) for the basic model and all other information (e.g., operational codes or overrides for the control settings) necessary to operate the basic model under the required conditions specified by the relevant test procedure. A manufacturer may also include with a certification report other supplementary items in PDF format for DOE's consideration in performing testing under subpart C of this part. For example, for oil-fired commercial water heating equipment (other than residential-duty commercial water heaters): The allowable range for $CO_2$ reading in percent (%) and the fuel pump pressure in pounds per square inch gauge (psig).

(d) *Certification reports for residential-duty commercial water heaters.* (1) The requirements of § 429.12 apply; and

(2) Pursuant to § 429.12(b)(13), a certification report for equipment must include the following public, equipment-specific information:

(i) Residential-duty commercial gas-fired and oil-fired storage water heaters: The uniform energy factor (UEF, rounded to the nearest 0.01), the rated storage volume in gallons (gal, rounded to the nearest 1 gal), the first-hour rating in gallons (gal, rounded to the nearest 1 gal), and the recovery efficiency in percent (%, rounded to the nearest 1%).

(ii) Residential-duty commercial electric instantaneous water heaters: The uniform energy factor (UEF, rounded to the nearest 0.01), the rated storage volume in gallons (gal, rounded to the nearest 1 gal), the maximum gallons per minute (gpm, rounded to the nearest 0.1 gpm), and the recovery efficiency in percent (%, rounded to the nearest 1%).

(e) Alternative methods for determining efficiency or energy use for commercial water heating equipment can be found in § 429.70 of this subpart.

[76 FR 12451, Mar. 7, 2011; 76 FR 24776, May 2, 2011, as amended at 78 FR 79594, Dec. 31, 2013; 79 FR 25504, May 5, 2014; 80 FR 151, Jan. 5, 2015; 79 FR 40565, July 11, 2014; 81 FR 79318, Nov. 10, 2016; 81 FR 96236, Dec. 29, 2016; 81 FR 96236, Dec. 29, 2016; 89 FR 82066, Oct. 9, 2024]

### § 429.45 Automatic commercial ice makers.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to automatic commercial ice makers; and

(2) For each basic model of automatic commercial ice maker selected for testing, a sample of sufficient size shall be randomly selected and tested to ensure that any represented value of energy use, condenser water use, or other measure of consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(i) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample; or,

(ii) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.10, where:

$$UCL = \bar{x} - t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; $s$ is the sample standard deviation; $n$ is the number of samples; and $t_{0.95}$ is the Student's t-Distribution Values for a 95 percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A to this subpart).

(3) The harvest rate of a basic model is the mean of the measured harvest rates for each tested unit of the basic model, based on the same tests to determine energy use and condenser water use, if applicable. Round the mean harvest rate to the nearest pound of ice per 24 hours (lb/24 h) for harvest rates above 50 lb/24 h; round the mean harvest rate to the nearest 0.1 lb/24 h for harvest rates less than or equal to 50 lb/24 h.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to automatic commercial ice makers; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The energy use in kilowatt hours per 100 pounds of ice (kWh/100 lb), the condenser water use in gallons per 100 pounds of ice (gal/100 lb), the harvest rate in lb/24 h, the type of cooling, and the equipment type.

(3) For reporting, round harvest rate to the nearest 1 lb/24 h for harvest rates above 50 lb/24 h; round condenser water use to the nearest 1 gal/100 lb; and round energy use to the nearest 0.01 kWh/100 lb.

[76 FR 12451, Mar. 7, 2011; 76 FR 24776, May 2, 2011, as amended at 87 FR 65899, Nov. 1, 2022; 89 FR 82067, Oct. 9, 2024]

### § 429.46 Commercial clothes washers.

NOTE 1 TO § 429.46: Prior to February 17, 2023, certification reports must be submitted as required either in this section or 10 CFR 429.46 as it appears in the 10 CFR parts 200 through 499 edition revised as of January 1, 2022. On or after February 17, 2023, certification reports must be submitted as required in this section.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to commercial clothes washers; and

(2) For each basic model of commercial clothes washers, a sample of sufficient size shall be randomly selected and tested to ensure that—

(i) Any represented value of the integrated water factor or other measure of energy or water consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The upper 97½ percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(ii) Any represented value of the modified energy factor, active-mode energy efficiency ratio, water efficiency ratio, or other measure of energy or water consumption of a basic model for which consumers would favor higher values shall be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The lower 97½ percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.975}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.975}$ is the t statistic for a 97.5% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(3) The clothes container capacity of a basic model reported in accordance with paragraph (b)(2) of this section shall be the mean of the measured clothes container capacity (C) of all tested units of the basic model.

(4) The corrected remaining moisture content (RMC) of a basic model reported in accordance with paragraph (b)(2) of this section shall be the mean of the final RMC value measured for all tested units of the basic model.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to commercial clothes washers; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information:

(i) The modified energy factor ($MEF_{J2}$), in cubic feet per kilowatt-hour per cycle (cu ft/kWh/cycle);

(ii) The integrated water factor (IWF), in gallons per cycle per cubic feet (gal/cycle/cu ft);

(iii) The clothes container capacity, in cubic feet (cu ft);

(iv) The type of loading (top-loading or front-loading); and

(v) The corrected RMC (expressed as a percentage).

(c) *Reported values.* Values reported pursuant to this section must be rounded as follows: Clothes container capacity to the nearest 0.1 cu ft, and corrected RMC to the nearest 0.1 percentage point.

[76 FR 12451, Mar. 7, 2011; 76 FR 24777, May 2, 2011, as amended at 79 FR 71630, Dec. 3, 2014; 87 FR 33379, June 1, 2022; 87 FR 43979, July 22, 2022]

### § 429.47 Distribution transformers.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to distribution transformers; and

(2) For each basic model of distribution transformer, efficiency must be determined either by testing, in accordance with § 431.193 and the provisions of this section, or by application of an AEDM that meets the requirements of § 429.70 and the provisions of this section.

(i) For each basic model selected for testing:

(A) If the manufacturer produces five or fewer units of a basic model over 6 months, each unit must be tested. A manufacturer may not use a basic model with a sample size of fewer than five units to substantiate an AEDM pursuant to § 429.70.

(B) If the manufacturer produces more than five units over 6 months, a sample of at least five units must be selected and tested.

(ii) Any represented value of efficiency of a basic model must satisfy the condition:

$$RE \leq \frac{100}{1 + \left(\frac{100 - \bar{x}}{\bar{x}}\right)\left(\frac{\sqrt{n}}{\sqrt{n} + .08}\right)}$$

where $\bar{x}$ is the average efficiency of the sample.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to distribution transformers except that required information in paragraph (b) of this section may be reported by kVA grouping instead of by basic model and paragraph (b)(6) of this section does not apply; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: For the most and least efficient basic models within each ''kVA grouping'' for which part 431 prescribes an efficiency standard, the kVA rating, the insulation type (*i.e.*, low-voltage dry-type, medium-voltage dry-type or liquid-immersed), the number of phases (*i.e.*, single-phase or three-phase), and the basic impulse insulation level (BIL) group rating (for medium-voltage dry-types).

(c) *Alternative methods for determining efficiency or energy use* for distribution transformers can be found in § 429.70 of this subpart.

(d) *Kilovolt ampere (kVA) grouping.* As used in this section, a ''kVA grouping'' is a group of basic models which all have the same kVA rating, have the same insulation type (*i.e.*, low-voltage dry-type, medium-voltage dry-type or liquid-immersed), have the same number of phases (*i.e.*, single-phase or three-phase), and, for medium-voltage dry-types, have the same BIL group rating (*i.e.*, 20–45 kV BIL, 46–95 kV BIL or greater than or equal to96 kV BIL).

### § 429.48 Illuminated exit signs.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to illuminated exit signs; and

(2) For each basic model of illuminated exit sign selected for testing, a sample of sufficient size shall be randomly selected and tested to ensure that—

(i) Any represented value of input power demand or other measure of energy consumption of a basic model for which consumers would favor lower

values shall be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.10, where:

$$UCL = \bar{x} + t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% two-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(ii) Any represented value of the energy efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.90, where:

$$LCL = \bar{x} - t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% two-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to illuminated exit signs; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The input power demand in watts (W) and the number of faces.

[76 FR 12451, Mar. 7, 2011; 76 FR 24778, May 2, 2011]

### § 429.49 Traffic signal modules and pedestrian modules.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to traffic signal modules and pedestrian modules; and

(2) For each basic model of traffic signal module or pedestrian module selected for testing, a sample of sufficient size shall be randomly selected and tested to ensure that—

(i) Any represented value of estimated maximum and nominal wattage or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.10, where:

$$UCL = \bar{x} + t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% two-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(ii) Any represented value of the energy efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.90, where:

$$LCL = \bar{x} - t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% two-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to traffic signal modules and pedestrian modules; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The maximum wattage at 74 degrees Celsius (°C) in watts (W), the nominal wattage at 25 degrees Celsius (°C) in watts (W), and the signal type.

[76 FR 12451, Mar. 7, 2011; 76 FR 24778, May 2, 2011]

### § 429.50 Commercial unit heaters.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to commercial unit heaters; and

(2) [Reserved]

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to commercial unit heaters; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The type of ignition system and a declaration that the manufacturer has incorporated the applicable design requirements.

### § 429.51 Commercial pre-rinse spray valves.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 apply to commercial prerinse spray valves; and

(2) For each basic model of commercial prerinse spray valve, a sample of sufficient size must be randomly selected and tested to ensure that any represented value of flow rate must be greater than or equal to the higher of:

(i) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean;
n is the number of samples; and
$x_i$ is the $i^{th}$ sample; Or,

(ii) The upper 95-percent confidence limit (UCL) of the true mean divided by 1.10, where:

$$UCL = \bar{x} + t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

and, $\bar{x}$ is the sample mean;
s is the sample standard deviation;
n is the number of samples; and
$t_{0.95}$ is the t statistic for a 95-percent two-tailed confidence interval with n-1 degrees of freedom (from Appendix A of this subpart).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to commercial prerinse spray valves; and

(2) Pursuant to § 429.12(b)(13), a certification report must include the following public product-specific information: The flow rate, in gallons per minute (gpm), rounded to the nearest 0.01 gpm, and the corresponding spray force, in ounce-force (ozf), rounded to the nearest 0.1 ozf.

[76 FR 12451, Mar. 7, 2011; 76 FR 24779, May 2, 2011, as amended at 78 FR 62986, Oct. 23, 2013; 80 FR 81453, Dec. 30, 2015; 81 FR 4801, Jan. 27, 2016]

### § 429.52 Refrigerated bottled or canned beverage vending machines.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to refrigerated bottled or canned beverage vending machine; and

(2) For each basic model of refrigerated bottled or canned beverage vending machine selected for testing, a sample of sufficient size shall be randomly selected and tested to ensure that—

(i) Any represented value of energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.10, where:

$$UCL = \bar{x} + t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% two-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

and

(ii) Any represented value of the energy efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.90, where:

$$LCL = \bar{x} - t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% two-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(3) The representative value of refrigerated volume of a basic model reported in accordance with paragraph (b)(2) of this section shall be the mean of the refrigerated volumes measured for each tested unit of the basic model and determined in accordance with the test procedure in § 431.296.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to refrigerated bottled or canned beverage vending machine; and

(2) Pursuant to § 429.12(b)(13), a certification report must include the following additional public, equipment-specific information:

(i) When using appendix A of subpart Q of part 431of this chapter, the daily energy consumption in kilowatt hours per day (kWh/day), the refrigerated volume (V) in cubic feet ($ft^3$), whether testing was conducted with payment mechanism in place and operational, and, if applicable, the lowest application product temperature in degrees Fahrenheit ( °F), if applicable.

(ii) When using appendix B of subpart Q of part 431of this chapter, the daily energy consumption in kilowatt hours per day (kWh/day), the refrigerated volume (V) in cubic feet ($ft^3$), whether testing was conducted with payment mechanism in place and operational, whether testing was conducted using an accessory low power mode, whether rating was based on the presence of a refrigeration low power mode, and, if applicable, the lowest application product temperature in degrees Fahrenheit ( °F).

[76 FR 12451, Mar. 7, 2011; 76 FR 24779, May 2, 2011, as amended at 76 FR 38292, June 30, 2011; 80 FR 45792, July 31, 2015; 81 FR 1112, Jan. 8, 2016]

### § 429.53 Walk-in coolers and walk-in freezers.

(a) *Determination of represented value.* (1) The requirements of § 429.11 apply to walk-in coolers and walk-in freezers; and

(2) For each basic model of walk-in cooler and walk-in freezer refrigeration system, the annual walk-in energy factor (AWEF) must be determined either by testing, in accordance with § 431.304 of this chapter and the provisions of this section, or by application of an AEDM that meets the requirements of § 429.70 and the provisions of this section.

(i) *Applicable test procedure.* If AWEF or AWEF2 is determined by testing, test according to the applicable provisions of § 431.304(b) of this chapter with the following equipment-specific provisions.

(A) *Dedicated condensing units.* Outdoor dedicated condensing refrigeration systems that are also designated for use in indoor applications must be tested and rated as both an outdoor dedicated condensing refrigeration system and an indoor dedicated refrigeration system.

(B) *Matched refrigeration systems.* A matched refrigeration system is not required to be rated if the constituent unit cooler(s) and dedicated condensing unit have been tested as specified in

§ 431.304(b)(4) of this chapter. However, if a manufacturer wishes to represent the efficiency of the matched refrigeration system as distinct from the efficiency of either constituent component, or if the manufacturer cannot rate one or both of the constituent components using the specified method, the manufacturer must test and rate the matched refrigeration system as specified in § 431.304(b)(4) of this chapter.

(C) *Detachable single-packaged dedicated systems.* Detachable single-packaged dedicated systems must be tested and rated as a single-packaged dedicated systems using the test procedure in § 431.304(b)(4) of this chapter.

(D) *Attached split systems.* Attached split systems must be tested and rated as dedicated condensing units and unit coolers using the test procedure in § 431.304(b)(4) of this chapter.

(ii) *Units to be tested.* (A) If the represented value for a given refrigeration system basic model is determined through testing, the general requirements of § 429.11 apply; and

(B) For each basic model, a sample of sufficient size shall be randomly selected and tested to ensure that any represented value of AWEF or other measure of energy efficiency of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample, or,

(*2*) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n–1 degrees of freedom (from appendix A to subpart B).

(C) The represented value of net capacity shall be the average of the capacities measured for the sample selected.

(iii) *Alternative efficiency determination methods.* In lieu of testing, pursuant to the requirements of § 429.70 and the provisions of this section, a represented value of AWEF for a basic model of a walk-in cooler or walk-in freezer refrigeration system may be determined through the application of an AEDM, where:

(A) Any represented value of AWEF or other measure of energy efficiency of a basic model for which consumers would favor higher values shall be less than or equal to the output of the AEDM and greater than or equal to the Federal standard for that basic model.

(B) The represented value of net capacity must be the net capacity simulated by the AEDM.

(3) For each basic model of walk-in cooler and walk-in freezer display and non-display door, the daily energy consumption must be determined by testing, in accordance with § 431.304 of this chapter and the provisions of this section, or by application of an AEDM that meets the requirements of § 429.70 and the provisions of this section.

(i) *Applicable test procedure.* Prior to October 31, 2023 use the test procedure

for walk-ins in 10 CFR part 431, subpart R, appendix A, revised as of January 1, 2022, to determine daily energy consumption. Beginning October 31, 2023, use the test procedure in part 431, subpart R, appendix A of this chapter to determine daily energy consumption.

(ii) *Units to be tested.* For each basic model, a sample of sufficient size shall be randomly selected and tested to ensure that any represented value of daily energy consumption of a basic model or other measure of energy use for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample, where:

EQUATION 3 TO PARAGRAPH (A)(3)(II)(A)

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And $\bar{x}$ is the sample mean, $n$ is the number of samples, and $\bar{x}_i$ is the ith sample; or,

(B) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.05, where:

EQUATION 4 TO PARAGRAPH (A)(3)(II)(B)

$$UCL = \bar{x} + t_{0.95}\frac{s}{\sqrt{n}}$$

And $\bar{x}$ is the sample mean, $s$ is the sample standard deviation; $n$ is the number of samples, and $t_{-0.95}$ is the statistic for a 95 percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A to this subpart).

(4) For each basic model of walk-in cooler and walk-in freezer panel and non-display door, the R-value must be determined by testing, in accordance with § 431.304 of this chapter and the provisions of this section.

(i) *Applicable test procedure.* Prior to October 31, 2023, use the test procedure for walk-ins in 10 CFR part 431, subpart R, appendix B, revised as of January 1, 2022, to determine R-value. Beginning October 31, 2023, use the test procedure in appendix B to subpart R of part 431 of this chapter to determine R-value.

(ii) *Units to be tested.* For each basic model, a sample of sufficient size shall be randomly selected and tested to ensure that any represented value of R-value or other measure of efficiency of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample, where:

EQUATION 5 TO PARAGRAPH (A)(4)(II)(A)

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And $\bar{x}$ is the sample mean, $n$ is the number of samples, and $\bar{x}_i$ is the $i^{th}$ sample; or,

(B) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.95, where:

EQUATION 6 TO PARAGRAPH (A)(4)(II)(B)

$$LCL = \bar{x} - t_{0.95}\frac{s}{\sqrt{n}}$$

And $\bar{x}$ is the sample mean, $s$ is the sample standard deviation; $n$ is the number of samples, and $t_{-0.95}$ is the statistic for a 95 percent one-tailed confidence interval with n–1 degree of freedom (from appendix A to this subpart).

(b) *Certification reports.* (1) The requirements of §429.12 apply to manufacturers of walk-in cooler and walk-in freezer panels, doors, and refrigeration systems, and;

(2) Pursuant to §429.12(b)(13), a certification report must include the following public product-specific information:

(i) For display and non-display doors:

(A) The door type;

(B) R-value of the door insulation (as applicable);

(C) A declaration that the manufacturer has incorporated the applicable design requirements;

(D) For transparent reach-in display doors and windows, the glass type of the doors and windows (*e.g.*, double-pane with heat reflective treatment, triple-pane glass with gas fill);

(E) Power draw of the anti-sweat heater in watts per square foot of door opening;

(F) Door energy consumption in kilowatt-hours per day;

(G) Rated surface area in square feet; and

(H) For doors with anti-sweat heater controls, the range of temperature conditions (in degrees Fahrenheit) and/or relative humidity conditions (in percent, %) at which the anti-sweat heater turns on.

(ii) For panels: The R-value of the insulation.

(iii) For refrigeration systems:

(A) The installed motor's functional purpose (*i.e.*, evaporator fan motor or condenser fan motor), its rated horsepower, and a declaration that the manufacturer has incorporated the applicable walk-in-specific design requirements into the motor;

(B) The refrigeration system AWEF and net capacity in BTU/h;

(C) The configuration tested for certification (*e.g.*, condensing unit only, unit cooler only, single-packaged dedicated system matched-pair, attached

split-system, or detachable single-packaged system);

(D) Whether an indoor dedicated condensing unit is also certified as an outdoor dedicated condensing unit and, if so, the basic model number for the outdoor dedicated condensing unit; and

(E) Whether the certified basic model meets the definition of a $CO_2$ unit cooler.

(3) Pursuant to § 429.12(b)(13), a certification report must include the following non-public product-specific information in addition to the information listed in paragraph (b)(2) of this section:

(i) *For display and non-display doors:*

(A) The rated power of each light, heater wire, and/or other electricity consuming device associated with each basic model of display and non-display door; and whether such device(s) has a timer, control system, or other demand-based control reducing the device's power consumption; and

(B) The conduction load through the door in Btu/h.

(ii) *For refrigeration systems:*

(A) Whether the dedicated condensing system using flooded head pressure controls; and

(B) The compressor break-in period, if used.

(4) Pursuant to § 429.12(b)(13), a certification report must include supplemental information submitted in PDF format. The equipment-specific supplemental information must be consistent with the equipment's installation or operating instructions; include any additional testing and testing set up instructions (*e.g.*, charging instructions) for the basic model; identify all special features that were included in rating the basic model; and include all other information (*e.g.*, any specific settings or controls) necessary to operate the basic model under the required conditions specified by the relevant test procedure. A manufacturer may also include with a certification report other supplementary items in PDF format (*e.g.*, operating manuals and/or installation instructions) for DOE to consider when performing testing under appendix C and appendix C1 to subpart R of part 431.

[81 FR 95799, Dec. 28, 2016, as amended at 88 FR 28835, May 4, 2023; 89 FR 82067, Oct. 9, 2024]

### § 429.54 Metal halide lamp ballasts and fixtures.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to metal halide lamp ballasts; and

(2) For each basic model of metal halide lamp ballast selected for testing, a sample of sufficient size, not less than four, shall be selected at random and tested to ensure that:

(i) Any represented value of estimated energy efficiency calculated as the measured output power to the lamp divided by the measured input power to the ballast ($P_{out}/P_{in}$), of a basic model is less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample;

Or,

(B) The lower 99-percent confidence limit (LCL) of the true mean divided by 0.99.

$$LCL = \bar{x} - t_{.99}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.99}$ is the t statistic for a 99% two-tailed confidence interval with n–1 degrees of freedom (from appendix A).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to metal halide lamp ballasts; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The minimum ballast efficiency in percent (%), the lamp wattage in watts (W), and the type of ballast (*e.g.*, pulse-start, magnetic probe-start, and non-pulse start electronic).

[76 FR 12451, Mar. 7, 2011; 76 FR 24780, May 2, 2011; 76 FR 46202, Aug. 2, 2011]

### § 429.55 Incandescent reflector lamps.

NOTE 1 TO § 429.55: Prior to February 17, 2023, certification reports must be submitted as required either in this section or 10 CFR 429.27 as it appears in the 10 CFR parts 200 through 499 edition revised as of January 1, 2022. On or after February 17, 2023, certification reports must be submitted as required in this section.

(a) *Determination of Represented Value.* Each manufacturer must determine represented values, which include the certified ratings, for each basic model, in accordance with the following sampling provisions.

(1) Units to be tested.

(i) When testing, use a sample comprised of production units. The same sample of units must be tested and used as the basis for representations for initial lumen output, rated wattage, lamp efficacy, color rendering index (CRI), correlated color temperature (CCT), and lifetime.

(ii) For each basic model, randomly select and test a sample of sufficient size, but not less than 10 units, to ensure that represented values of average lamp efficacy, CRI and initial lumen output are less than or equal to the lower of:

(A) The arithmetic mean of the sample; or,

(B) The lower 95 percent confidence limit (LCL) of the true mean divided by .97, where:

$$LCL = \bar{x} - t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(2) Any represented values of measures of energy efficiency or energy consumption for all individual models represented by a given basic model must be the same.

(3) Represented values of CCT and rated wattage must be equal to the arithmetic mean of the sample.

(4) Represented values of lifetime must be equal to or less than the median time to failure of the sample (calculated as the arithmetic mean of the time to failure of the two middle sample units (or the value of the middle sample unit if there are an odd number of units) when the measured values are sorted in value order).

(5) Calculate represented values of life (in years) by dividing the represented lifetime of these lamps as determined in paragraph (a)(4) of this section by the estimated daily operating hours as specified in 16 CFR 305.23(b)(3)(iii) multiplied by 365.

(6) Represented values of the estimated annual energy cost, expressed in dollars per year, must be the product of the rated wattage in kilowatts, an electricity cost rate as specified in 16 CFR 305.23(b)(1)(ii), and an estimated average daily use as specified in 16 CFR 305.23(b)(1)(ii) multiplied by 365.

(b) *Certification reports.* (1) The requirements of § 429.12 apply to incandescent reflector lamps; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The testing laboratory's ILAC accreditation body's identification number or other approved identification assigned by the ILAC accreditation body, average lamp efficacy in lumens per watt (lm/W), rated wattage in watts (W), rated voltage (V), diameter in inches, and CRI.

(c) *Rounding Requirements.* (1) Round rated wattage to the nearest tenth of a watt.

(2) Round initial lumen output to three significant digits.

(3) Round average lamp efficacy to the nearest tenth of a lumen per watt.

(4) Round CCT to the nearest 100 kelvin (K).

(5) Round CRI to the nearest whole number.

(6) Round lifetime to the nearest whole hour.

(7) Round life (in years) to the nearest tenth.

(8) Round annual energy cost to the nearest cent.

[87 FR 53638, Aug. 31, 2022]

## § 429.56 Integrated light-emitting diode lamps.

(a) *Determination of Represented Value.* Manufacturers must determine the represented value, which includes the certified rating, for each basic model of integrated light-emitting diode lamps by testing, in conjunction with the sampling provisions in this section.

(1) *Units to be tested.*

(i) The general requirements of § 429.11 (a) are applicable except that the sample must be comprised of production units; and

(ii) For each basic model of integrated light-emitting diode lamp, the minimum number of units tested must be no less than 10 and the same sample comprised of the same units must be used for testing all metrics. If more than 10 units are tested as part of the sample, the total number of units must be a multiple of two. For each basic model, a sample of sufficient size must be randomly selected and tested to ensure that:

(A) Represented values of initial lumen output, lamp efficacy, color rendering index (CRI), power factor, or other measure of energy consumption of a basic model for which consumers would favor higher values are less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of units; and $x_i$ is the measured value for the $i^{th}$ unit; Or,

(*2*) The lower 99 percent confidence limit (LCL) of the true mean divided by 0.96; or the lower 99 percent confidence limit (LCL) of the true mean divided by 0.98 for CRI and power factor, where:

$$LCL = \bar{x} - t_{0.99}\left(\frac{s}{\sqrt{n}}\right)$$

and, $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.99}$ is the t statistic for a 99 percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A to this subpart).

(B) Represented values of input power, standby mode power or other

measure of energy consumption of a basic model for which consumers would favor lower values are greater than or equal to the higher of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of units; and $x_i$ is the measured value for the $i^{th}$ unit;

Or,

(*2*) The upper 99 percent confidence limit (UCL) of the true mean divided by 1.02, where:

$$UCL = \bar{x} + t_{0.99}\left(\frac{s}{\sqrt{n}}\right)$$

and, $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.99}$ is the t statistic for a 99 percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A to this subpart);

(C) Represented values of correlated color temperature (CCT) of a basic model must be equal to the mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of units in the sample; and $x_i$ is the measured CCT for the $i^{th}$ unit.

(D) The represented value of lifetime of an integrated light-emitting diode lamp must be equal to or less than the median time to failure of the sample (calculated as the arithmetic mean of the time to failure of the two middle sample units when the numbers are sorted in value order) rounded to the nearest hour.

(2) The represented value of life (in years) of an integrated light-emitting diode lamp must be calculated by dividing the lifetime of an integrated light-emitting diode lamp by the estimated annual operating hours as specified in 16 CFR 305.15(b)(3)(iii).

(3) The represented value of estimated annual energy cost for an integrated light-emitting diode lamp, expressed in dollars per year, must be the product of the input power in kilowatts, an electricity cost rate as specified in 16 CFR 305.15(b)(1)(ii), and an estimated average annual use as specified in 16 CFR 305.15(b)(1)(ii).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to integrated light-emitting diode lamps;

(2) Values reported in certification reports are represented values. Pursuant to § 429.12(b)(13), a certification report must include the following public product-specific information: The testing laboratory's NVLAP identification number or other NVLAP-approved accreditation identification, the date of manufacture, initial lumen output in lumens (lm), input power in watts (W), lamp efficacy in lumens per watt (lm/W), CCT in kelvin (K), power factor,

lifetime in years (and whether value is estimated), and life (and whether value is estimated). For lamps with multiple modes of operation (such as variable CCT or CRI), the certification report must also list which mode was selected for testing and include detail such that another laboratory could operate the lamp in the same mode. Lifetime and life are estimated values until testing is complete. When reporting estimated values, the certification report must specifically describe the prediction method, which must be generally representative of the methods specified in appendix BB. Manufacturers are required to maintain records per § 429.71 of the development of all estimated values and any associated initial test data.

(c) *Rounding requirements.* (1) Round input power to the nearest tenth of a watt.

(2) Round lumen output to three significant digits.

(3) Round lamp efficacy to the nearest tenth of a lumen per watt.

(4) Round correlated color temperature to the nearest 100 Kelvin.

(5) Round color rendering index to the nearest whole number.

(6) Round power factor to the nearest hundredths place.

(7) Round lifetime to the nearest whole hour.

(8) Round standby mode power to the nearest tenth of a watt.

[81 FR 43425, July 1, 2016]

### § 429.57 General service lamps.

(a) *Determination of represented value.* Manufacturers must determine represented values, which includes certified ratings, for each basic model of general service lamp in accordance with following sampling provisions.

(1) The requirements of § 429.11 are applicable to general service lamps, and

(2) For general service incandescent lamps, use § 429.27(a);

(3) For compact fluorescent lamps, use § 429.35(a);

(4) For integrated LED lamps, use § 429.56(a);

(5) For other incandescent lamps, use § 429.27(a);

(6) For other fluorescent lamps, use § 429.35(a); and

(7) For OLED lamps and non-integrated LED lamps, use § 429.56(a).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to general service lamps;

(2) Values reported in certification reports are represented values;

(3) For general service incandescent lamps, use § 429.27(b);

(4) For compact fluorescent lamps, use § 429.35(b);

(5) For integrated LED lamps, use § 429.56(b); and

(6) For other incandescent lamps, for other fluorescent lamps, for OLED lamps and non-integrated LED lamps, pursuant to § 429.12(b)(13), a certification report must include the following public product-specific information: The testing laboratory's ILAC accreditation body's identification number or other approved identification assigned by the ILAC accreditation body, initial lumen output, input power, lamp efficacy, and power factor. For non-integrated LED lamps, the certification report must also include the input voltage and current used for testing.

(c) *Rounding requirements.* (1) Round input power to the nearest tenth of a watt.

(2) Round initial lumen output to three significant digits.

(3) Round lamp efficacy to the nearest tenth of a lumen per watt.

(4) Round power factor to the nearest hundredths place.

(5) Round standby mode power to the nearest tenth of a watt.

[81 FR 72503, Oct. 20, 2016]

### § 429.58 Furnace fans.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to furnace fans; and

(2) For each basic model of furnace fan within the scope of appendix AA of subpart B of part 430, a sample of sufficient size shall be randomly selected and tested to ensure that any represented value of fan energy rating (FER), rounded to the nearest integer, shall be greater than or equal to the higher of:

(i) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And, $\bar{x}$ is the sample mean; $n$ is the number of samples; and $x_i$ is the measured value for the $i^{th}$ sample; Or,

(ii) The upper 90 percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{0.90}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; $s$ is the sample standard deviation; $n$ is the number of samples; and $t_{0.90}$ is the t statistic for a 90% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to residential furnace fans; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The fan energy rating (FER) in watts per thousand cubic feet per minute (W/1000 cfm); the calculated maximum airflow at the reference system external static pressure (ESP) in cubic feet per minute (cfm); the control system configuration for achieving the heating and constant-circulation airflow-control settings required for determining FER as specified in the furnace fan test procedure (10 CFR part 430, subpart B, appendix AA); the measured steady-state gas, oil, or electric heat input rate ($Q_{IN}$) in the heating setting required for determining FER; and for modular blowers, the manufacturer and model number of the electric heat resistance kit with which it is equipped for certification testing.

[79 FR 520, Jan. 3, 2014, as amended at 79 FR 38208, July 3, 2014]

### § 429.59 Pumps.

NOTE 1 TO § 429.59: Prior to February 17, 2023, certification reports must be submitted as required either in this section or 10 CFR 429.59 as it appears in the 10 CFR parts 200 through 499 edition revised as of January 1, 2022. On or after February 17, 2023, certification reports must be submitted as required in this section.

(a) *Determination of represented value.* Manufacturers must determine the represented value, which includes the certified rating, for each basic model of general purpose pump either by testing (which includes the calculation-based methods in the test procedure), in conjunction with the following sampling provisions, or by application of an AEDM that meets the requirements of § 429.70 and the provisions of this section. Manufacturers must determine the represented value, which includes the certified rating, for each basic model of dedicated-purpose pool pump by testing, in conjunction with the following sampling provisions. Manufacturers must update represented values to account for any change in the applicable motor standards in subpart B of part 431 of this chapter and certify amended values as of the next annual certification.

(1) Units to be tested. The requirements of § 429.11 are applicable to pumps; and for each basic model, a sample of sufficient size shall be randomly selected and tested to ensure that—

(i) Any representation of the constant load pump energy index ($PEI_{CL}$), variable load pump energy index ($PEI_{VL}$), circulator energy index (CEI), or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample,

where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and $\bar{x}$ is the sample mean, n is the number of samples, and $x_i$ is the maximum of the ith sample;

Or,

(B) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.05,

where:

$$UCL = \bar{x} \mp t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

and $\bar{x}$ is the sample mean, *s* is the sample standard deviation, n is the number of samples, and $t_{0.95}$ is the t statistic for a 95 percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A of subpart B of part 429).

(ii) Any representation of weighted energy factor of a basic model must be less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the maximum of the ith sample; or,

(B) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95 percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A of this subpart).

(2) *Other representations*—(i) *Rated hydraulic horsepower.* The representative value of rated hydraulic horsepower of a basic model of dedicated-purpose pool pump or circulator pump must be the mean of the rated hydraulic horsepower for each tested unit.

(ii) *Dedicated-purpose pool pump motor total horsepower.* The representative value of dedicated-purpose pool pump motor total horsepower of a basic model of dedicated-purpose pool pump must be the mean of the dedicated-purpose pool pump motor total horsepower for each tested unit.

(iii) *True power factor ($PF_i$).* The representative value of true power factor at each load point i of a basic model of dedicated-purpose pool pump must be the mean of the true power factors at that load point for each tested unit of dedicated-purpose pool pump.

(iv) *General pumps.* The representative values for pump total head in feet at BEP and nominal speed, volume per

unit time in gallons per minute at BEP and nominal speed, and calculated driver power input at each load point must be the arithmetic mean of the value determined for each tested unit of general pump.

(v) *Input power*. The representative value(s) of input power of a basic model of circulator pump at a load point(s) used in the calculation of CEI must be determined based on the mean of the input power at measured data point(s) for each tested unit.

(vi) *Flow at BEP and maximum speed*. The representative value of flow at BEP and maximum speed of a basic model of circulator pump must be determined based on the mean of the flow at BEP and maximum speed for each tested unit.

(vii) *Head at BEP and maximum speed*. The representative value of head at BEP and maximum speed of a basic model of circulator pump must be determined based on the mean of the head at BEP and maximum speed for each tested unit.

(viii) *Other reported values*. The representative value of any other reported value of a basic model of circulator pump must be determined based on the mean of that value for each tested unit.

(3) *Alternative efficiency determination methods*. In lieu of testing, a represented value of efficiency or consumption for a basic model of pump must be determined through the application of an AEDM pursuant to the requirements of § 429.70 and the provisions of this section, where:

(i) Any represented value of energy consumption or other measure of energy use of a basic model for which consumers would favor lower values shall be greater than or equal to the output of the AEDM and less than or equal to the Federal standard for that basic model; and

(ii) Any represented value of energy efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the output of the AEDM and greater than or equal to the Federal standard for that basic model.

(b) *Certification reports*. (1) The requirements of § 429.12 are applicable to pumps; and

(2) Pursuant to § 429.12(b)(13), a certification report must include the following public product-specific information:

(i) For a pump subject to the test methods prescribed in section III of appendix A to subpart Y of part 431 of this chapter: $PEI_{CL}$; pump total head in feet (ft.) at BEP and nominal speed; volume per unit time (flow rate) in gallons per minute (gpm) at BEP and nominal speed; the nominal speed of rotation in revolutions per minute (rpm); calculated driver power input at each load point *i* ($P_i^{in}$), corrected to nominal speed, in horsepower (hp); full impeller diameter in inches (in.); and for RSV and ST pumps, the number of stages tested.

(ii) For a pump subject to the test methods prescribed in section IV or V of appendix A to subpart Y of part 431 of this chapter: $PEI_{CL}$; pump total head in feet (ft.) at BEP and nominal speed; volume per unit time (flow rate) in gallons per minute (gpm) at BEP and nominal speed; the nominal speed of rotation in revolutions per minute (rpm); driver power input at each load point i ($P_i^{in}$), corrected to nominal speed, in horsepower (hp); full impeller diameter in inches (in.); whether the $PEI_{CL}$ is calculated or tested; and for RSV and ST pumps, number of stages tested.

(iii) For a pump subject to the test methods prescribed in section VI or VII of appendix A to subpart Y of part 431 of this chapter: $PEI_{VL}$; pump total head in feet (ft.) at BEP and nominal speed; volume per unit time (flow rate) in gallons per minute (gpm) at BEP and nominal speed; the nominal speed of rotation in revolutions per minute (rpm); driver power input (measured as the input power to the driver and controls) at each load point i ($P_i^{in}$), corrected to nominal speed, in horsepower (hp); full impeller diameter in inches (in.); whether the $PEI_{VL}$ is calculated or tested; and for RSV and ST pumps, the number of stages tested.

(iv) For a dedicated-purpose pool pump (other than an integral cartridge-filter or sand-filter pool pump): weighted energy factor (WEF) in

kilogallons per kilowatt-hour (kgal/kWh); rated hydraulic horsepower in horsepower (hp); the speed configuration for which the pump is being rated (*i.e.*, single-speed, two-speed, multi-speed, or variable-speed); true power factor at all applicable test procedure load points i (dimensionless), as specified in Table 1 of appendix B or C to subpart Y of part 431 of this chapter, as applicable; dedicated-purpose pool pump nominal motor horsepower in horsepower (hp); dedicated-purpose pool pump motor total horsepower in horsepower (hp); dedicated-purpose pool pump service factor (dimensionless); for self-priming pool filter pumps and non-self-priming pool filter pumps: the maximum head (in feet) which is based on the mean of the units in the tested sample; a statement regarding whether freeze protection is shipped enabled or disabled; for dedicated-purpose pool pumps (DPPPs) distributed in commerce with freeze protection controls enabled: the default dry-bulb air temperature setting (in °F), default run time setting (in minutes), and default motor speed (in rpm); for self-priming pool filter pumps a statement regarding whether the pump is certified with NSF/ANSI 50–2015 (incorporated by reference, see § 429.4) as self-priming; and, for self-priming pool filter pumps that are not certified with NSF/ANSI 50–2015 as self-priming: the vertical lift (in feet) and true priming time (in minutes) for the DPPP model.

(v) For integral cartridge-filter and sand-filter pool pumps, the maximum run-time (in hours) of the pool pump control with which the integral cartridge-filter or sand-filter pump is distributed in commerce.

(3) Pursuant to § 429.12(b)(13), a certification report may include the following public product-specific information:

(i) For a pump subject to the test methods prescribed in section III of appendix A to subpart Y of part 431 of this chapter: Pump efficiency at BEP in percent (%) and $PER_{CL}$.

(ii) For a pump subject to the test methods prescribed in section IV or V of appendix A to subpart Y of part 431 of this chapter: Pump efficiency at BEP in percent (%) and $PER_{CL}$.

(iii) For a pump subject to the test methods prescribed in section VI or VII of appendix A to subpart Y of part 431 of this chapter: Pump efficiency at BEP in percent (%) and $PER_{VL}$.

(iv) For a dedicated-purpose pool pump (other than an integral cartridge-filter or sand-filter pool pump): Calculated driver power input and flow rate at each load point i ($P_i$ and $Q_i$), in horsepower (hp) and gallons per minute (gpm), respectively.

(4) Pursuant to § 429.12(b)(13), a certification report will include the following product-specific information:

(i) For a pump subject to the test methods prescribed in section III of appendix A to subpart Y of part 431 of this chapter: The pump configuration (*i.e.*, bare pump); and for ST pumps, the bowl diameter in inches (in.).

(ii) For a pump subject to the test methods prescribed in section IV or V of appendix A to subpart Y of part 431 of this chapter: The pump configuration (*i.e.*, pump sold with an electric motor); for pumps sold with electric motors regulated by DOE's energy conservation standards for electric motors at § 431.25, the nominal motor efficiency in percent (%) and the motor horsepower (hp) for the motor with which the pump is being rated; and for ST pumps, the bowl diameter in inches (in.).

(iii) For a pump subject to the test methods prescribed in section VI or VII of appendix A to subpart Y of part 431 of this chapter: The pump configuration (*i.e.*, pump sold with a motor and continuous or non-continuous controls); for pumps sold with electric motors regulated by DOE's energy conservation standards for electric motors at § 431.25, the nominal motor efficiency in percent (%) and the motor horsepower (hp) for the motor with which the pump is being rated; and for ST pumps, the bowl diameter in inches (in.).

(c) *Individual model numbers.* (1) For a pump subject to the test methods prescribed in appendix A to subpart Y of part 431 of this chapter, each individual model number required to be reported pursuant to § 429.12(b)(6) must consist of the following:

| Equipment configuration (as distributed in commerce) | Basic model number | Individual model number(s) | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Bare pump | Number unique to the basic model | Bare pump | N/A | N/A. |
| Bare pump with driver | Number unique to the basic model | Bare pump | Driver | N/A. |
| Bare pump with driver and controls | Number unique to the basic model | Bare pump | Driver | Controls. |

(2) Or must otherwise provide sufficient information to identify the specific driver model and/or controls model(s) with which a bare pump is distributed.

[81 FR 4144, Jan. 25, 2016, as amended at 81 FR 4430, Jan. 26, 2016; 82 FR 36918, Aug. 7, 2017; 87 FR 43979, July 22, 2022; 87 FR 57297, Sept. 19, 2022; 88 FR 17973, Mar. 24, 2023; 88 FR 24471, Apr. 21, 2023; 89 FR 82067, Oct. 9, 2024]

### § 429.60 Commercial packaged boilers.

(a) *Determination of represented value.* Manufacturers must determine the represented value, which includes the certified rating, for each basic model of commercial packaged boilers either by testing in accordance with § 431.86 of this chapter, in conjunction with the applicable sampling provisions, or by applying an AEDM.

(1) *Units to be tested.* (i) If the represented value is determined through testing, the general requirements of § 429.11 are applicable, except that, if the represented value is determined through testing pursuant to § 431.86(c) of this chapter, the number of units selected for testing may be one; and

(ii) For each basic model selected for testing, a sample of sufficient size shall be randomly selected and tested to ensure that—

(A) Any represented value of energy consumption or other measure of energy use of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample; Or,

(*2*) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n − 1 degrees of freedom (from Appendix A to subpart B of part 429). And,

(B) Any represented value of energy efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the $i^{th}$ sample; Or,

(*2*) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n − 1 degrees of freedom (from Appendix A to subpart B of part 429).

(2) *Alternative efficiency determination methods*. In lieu of testing, a represented value of efficiency or consumption for a basic model of commercial packaged boiler must be determined through the application of an AEDM pursuant to the requirements of § 429.70 and the provisions of this section, where:

(i) Any represented value of energy consumption or other measure of energy use of a basic model for which consumers would favor lower values shall be greater than or equal to the output of the AEDM and less than or equal to the Federal standard for that basic model; and

(ii) Any represented value of energy efficiency or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the output of the AEDM and greater than or equal to the Federal standard for that basic model.

(3) The rated input for a basic model reported in accordance with paragraph (b)(2) of this section must be the maximum rated input listed on the nameplate and in manufacturer literature for the commercial packaged boiler basic model. In the case where the nameplate and the manufacturer literature are not identical, DOE will use the nameplate on the unit for determining the rated input.

(4) For a model of commercial packaged boiler capable of supplying either steam or hot water, representative values for steam mode must be based on efficiency in steam mode and representative values for hot water mode must be based on either the efficiency in hot water mode or steam mode in accordance with the test procedure in § 431.86 of this chapter and the provisions of this section.

(b) *Certification reports*. (1) The requirements of § 429.12 are applicable to commercial packaged boilers; and

(2) Pursuant to § 429.12(b)(13), a certification report must include the following public, equipment-specific information:

(i) If oil-fired, the manufacturer (including brand, if applicable) and model number of the burner;

(ii) The rated input in British thermal units per hour (Btu/h);

(iii) The combustion efficiency in percent (%) to the nearest tenth of one percent or thermal efficiency in percent (%) to the nearest one tenth of one percent, as specified in § 431.87 of this chapter; and

(iv) For a basic model of commercial packaged boiler that cannot be tested using the standard inlet temperatures required in appendix A to subpart E of part 431, the average inlet water temperature measured at Point B in Figure C9 of ANSI/AHRI Standard 1500–2015 (incorporated by reference, see § 429.4) at which the model was tested.

(3) Pursuant to § 429.12(b)(13), a certification report must include the following additional equipment-specific information:

(i) Whether the basic model is engineered-to-order; and

(ii) For any basic model rated with an AEDM, whether the manufacturer elects the witness test option for verification testing. (See § 429.70(c)(5)(iii) for options). However, the manufacturer may not select more than 10% of AEDM-rated basic models to be eligible for witness testing.

(iii) For basic models of commercial packaged boilers that have a rated input greater than 5,000,000 Btu/h, a declaration about whether the certified efficiency rating is based on testing conducted pursuant to § 431.86(c) of this chapter.

(4) Pursuant to § 429.12(b)(13), a certification report may include supplemental testing instructions in PDF format. If necessary to run a valid test, the equipment-specific, supplemental information must include any additional testing and testing set up instructions (*e.g.*, specific operational or control codes or settings), which would be necessary to operate the basic model under the required conditions specified by the relevant test procedure. A manufacturer may also include with a certification report other supplementary items in PDF format (*e.g.*, manuals) for DOE consideration in performing testing under subpart C of this part.

(5) Any field tested pursuant to § 431.86(c) of this chapter basic model of a commercial packaged boiler that has not been previously certified through testing or an AEDM must be certified within 15 days of commissioning.

(c) Alternative methods for determining efficiency or energy use for commercial packaged boilers can be found in § 429.70.

[79 FR 25504, May 5, 2014, as amended at 80 FR 151, Jan. 5, 2015; 81 FR 89303, Dec. 9, 2016]

### § 429.61 Consumer miscellaneous refrigeration products.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to miscellaneous refrigeration products; and

(2) For each basic model of miscellaneous refrigeration product, a sample of sufficient size shall be randomly selected and tested to ensure that—

(i) Any represented value of estimated annual operating cost, energy consumption, or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the ith sample; or

(B) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.10, where:

$$UCL = \bar{x} + t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from appendix A of this subpart).

and

(ii) Any represented value of the energy factor or other measure of energy consumption of a basic model for which

consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And, $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the ith sample; or

(B) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.90, where:

$$LCL = \bar{x} - t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from appendix A of this subpart).

(3) The value of total refrigerated volume of a basic model reported in accordance with paragraph (b)(2) of this section shall be the mean of the total refrigerated volumes measured for each tested unit of the basic model or the total refrigerated volume of the basic model as calculated in accordance with § 429.72(d). The value of adjusted total volume of a basic model reported in accordance with paragraph (b)(2) of this section shall be the mean of the adjusted total volumes measured for each tested unit of the basic model or the adjusted total volume of the basic model as calculated in accordance with § 429.72(d).

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to miscellaneous refrigeration products; and

(2) Pursuant to § 429.12(b)(13), a certification report must include the following public product-specific information: The annual energy use in kilowatt hours per year (kWh/yr); the total refrigerated volume in cubic feet (cu ft) and the total adjusted volume in cubic feet (cu ft).

(3) Pursuant to § 429.12(b)(13), a certification report coolers or combination cooler refrigeration products shall include the following additional product-specific information: Whether the basic model has variable defrost control (in which case, manufacturers must also report the values, if any, of $CT_L$ and $CT_M$ (See section 5.3 in appendix A to subpart B of part 430 of this chapter) used in the calculation of energy consumption), whether the basic model has variable anti-sweat heater control (in which case, manufacturers must also report the values of heater Watts at the ten humidity levels (5%, 15%, 25%, 35%, 45%, 55%, 65%, 75%, 85%, and 95%) used to calculate the variable anti-sweat heater ''Correction Factor''), and whether testing has been conducted with modifications to the standard temperature sensor locations, as specified in section 5.1(g) of appendix A to subpart B of part 430 of this chapter.

(c) *Rounding requirements for representative values, including certified and rated values.* (1) The represented value of annual energy use must be rounded to the nearest kilowatt hour per year.

(2) The represented value of total refrigerated volume must be rounded to the nearest 0.1 cubic foot.

(3) The represented value of adjusted total volume must be rounded to the nearest 0.1 cubic foot.

(d) *Product category determination.* Each basic model of miscellaneous refrigeration product must be certified according to the appropriate product category as defined in § 430.2 of this chapter based on compartment volumes and compartment temperatures. If one or more compartments could be classified as both a fresh food compartment and a freezer compartment, the model must be certified to each applicable product category based on the operation of the compartment(s) as both fresh food and freezer compartments.

(1) Compartment volume used to determine product category shall be, for each compartment, the mean of the volumes of that specific compartment for the sample of tested units of the basic model, measured according to the provisions in section 4.1 of appendix A of subpart B of part 430 of this chapter, or, for each compartment, the volume of that specific compartment calculated for the basic model in accordance with § 429.72(d).

(2) For compartments other than cooler compartments, determination of the compartment temperature ranges shall be based on operation of the product under the conditions specified in appendix A to subpart B of part 430 of this chapter for miscellaneous refrigeration products. The determination of compartment status may require evaluation of a model at the extremes of the range of user-selectable temperature control settings. If the temperature ranges for the same compartment of multiple units of a sample are different, the maximum and minimum compartment temperatures for compartment status determination shall be based on the mean measurements for the units in the sample.

[81 FR 46790, July 18, 2016, as amended at 86 FR 56819, Oct. 12, 2021; 88 FR 7845, Feb. 7, 2023]

### § 429.62 Portable air conditioners.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to portable air conditioners; and

(2) For each basic model of portable air conditioner, a sample of sufficient size must be randomly selected and tested to ensure that—

(i) Any represented value of energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values is greater than or equal to the higher of:

(A) The mean of the sample:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Where:

$\bar{x}$ is the sample mean;
$x_i$ is the ith sample; and
n is the number of units in the test sample.

Or,

(B) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.10:

$$UCL = \bar{x} + t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

Where:

$\bar{x}$ is the sample mean;
s is the sample standard deviation;
n is the number of units in the test sample; and
$t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n–1 degrees of freedom.

And,

(ii) Any represented value of the combined energy efficiency ratio or other measure of energy consumption of a basic model for which consumers would favor higher values is less than or equal to the lower of:

(A) The mean of the sample:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Where:

$\bar{x}$ is the sample mean;
$x_i$ is the ith sample; and
n is the number of units in the test sample.

Or,

(B) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.90:

$$LCL = \bar{x} - t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

Where:

$\bar{x}$ is the sample mean;
s is the sample standard deviation;
n is the number of units in the test sample; and
$t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n–1 degrees of freedom.

And,

(3) When testing in accordance with appendix CC of subpart B of part 430 of this chapter, the represented value of cooling capacity for a single-speed portable AC shall be seasonally adjusted cooling capacity (''SACC'') and the represented value of cooling capacity for a variable-speed portable AC shall be full-load seasonally adjusted cooling capacity (''$SACC_{Full}$''), as determined in appendix CC to subpart B of part 430 of this chapter. When testing in accordance with appendix CC1 to subpart B of part 430 of this chapter, the represented value of cooling capacity for both single-speed and variable-speed portable ACs shall be SACC, as determined in appendix CC1 to subpart B of part 430 of this chapter.

(4) Where SACC is used for representation, the represented value of SACC of a basic model must be the mean of the SACC for each tested unit of the basic model. Likewise, where $SACC_{Full}$ is used for representation, the represented value of $SACC_{Full}$ of a basic model must be the mean of the $SACC_{Full}$ for each tested unit of the basic model. When using appendix CC to subpart B of part 430 of this chapter, round the mean SACC or $SACC_{Full}$ value to the nearest 50, 100, 200, or 500 Btu/h, depending on the magnitude of the calculated SACC or $SACC_{Full}$, as applicable, in accordance with Table 1 of ANSI/AHAM PAC–1–2015, (incorporated by reference, see § 429.4), ''Multiples for reporting Dual Duct Cooling Capacity, Single Duct Cooling Capacity, Spot Cooling Capacity, Water Cooled Condenser Capacity and Power Input Ratings''. When using appendix CC1 to subpart B of part 430 of this chapter, round SACC to the nearest 50, 100, 200, or 500 Btu/h, depending on the magnitude of the calculated SACC, in accordance with Table 1 of AHAM PAC–1–2022, (incorporated by reference, see § 429.4), ''Multiples for reporting Dual Duct Cooling Capacity, Single Duct Cooling Capacity, Spot Cooling Capacity, Water Cooled Condenser Capacity and Power Input Ratings''.

(5) The represented value of combined energy efficiency ratio (CEER) or annualized energy efficiency ratio of a basic model must be rounded to the nearest 0.1 British thermal units per Watt-hour (Btu/Wh).

(6) Single-duct and dual-duct portable air conditioners distributed in commerce by the manufacturer with multiple duct configuration options that meet DOE's definitions for single-duct portable AC and dual-duct portable AC, must be rated and certified under both applicable duct configurations.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to single-duct and dual-duct portable air conditioners; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The CEER in Btu/Wh, the seasonally adjusted cooling capacity in British thermal units per hour (Btu/h), the duct configuration used for testing (single-duct or dual-duct), the ability to operate in both duct configurations (yes or no), presence of heating function, and primary condensate removal feature (auto-evaporation, gravity drain, removable internal collection bucket, or condensate pump).

(3) Pursuant to § 429.12(b)(13), a certification report shall include the following additional public product-specific information: whether the basic model is variable-speed (yes or no), and if yes; the full-load seasonally adjusted cooling capacity ($SACC_{Full}$), in British thermal units per hour (Btu/h).

[81 FR 35264, June 1, 2016, as amended at 85 FR 1446, Jan. 10, 2020; 88 FR 31126, May 15, 2023; 89 FR 82068, Oct. 9, 2024]

## § 429.63 Compressors.

(a) *Determination of represented value.* Manufacturers must determine the represented value, which includes the certified rating, for each basic model of compressor either by testing in conjunction with the applicable sampling provisions or by applying an AEDM.

(1) *Units to be tested.* (i) If the represented value is determined through testing, the general requirements of § 429.11 apply; and

(ii) For each basic model selected for testing, a sample of sufficient size must be randomly selected and tested to ensure that—

(A) *Measures of energy efficiency.* Any represented value of the full- or part-load package isentropic efficiency or other measure of energy efficiency of a basic model for which customers would favor higher values is less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And $\bar{x}$ is the sample mean; n is the number of samples; and $x_i$ is the measured value for the $i^{th}$ sample; or,

(*2*) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95 percent one-tailed confidence interval with $n-1$ degrees of freedom (from appendix A of this subpart); and

(B) *Package specific power.* The representative value(s) of package specific power of a basic model must be the mean of the package specific power measurement(s) for each tested unit of the basic model.

(2) *Alternative efficiency determination methods.* In lieu of testing, any represented value of efficiency, consumption, or other non-energy metrics listed in paragraph (a)(3) of this section for a basic model may be determined through the application of an AEDM pursuant to the requirements of § 429.70

and the provisions of this section, where:

(i) Any represented values of package isentropic efficiency or other measure of energy consumption of a basic model for which customers would favor higher values must be less than or equal to the output of the AEDM; and

(ii) Any represented values of package specific power, pressure ratio at full-load operating pressure, full-load actual volume flow rate, or full-load operating pressure must be the output of the AEDM corresponding to the represented value of package isentropic efficiency determined in paragraph (a)(2)(i) of this section.

(3) *Representations of non-energy metrics*—(i) *Full-load actual volume flow rate.* The representative value of full-load actual volume flow rate of a basic model must be either—

(A) The mean of the full-load actual volume flow rate for the units in the sample; or

(B) As determined through the application of an AEDM pursuant to the requirements of § 429.70.

(ii) *Full-load operating pressure.* The representative value of full-load operating pressure of a basic model must be less than or equal to the maximum full-flow operating pressure and greater than or equal to the lesser of—

(A) 90 percent of the maximum full-flow operating pressure; or

(B) 10 psig less than the maximum full-flow operating pressure, where the maximum full-flow operating pressure must either be determined as the mean of the maximum full-flow operating pressure values for the units in the sample or through the application of an AEDM pursuant to the requirements of § 429.70.

(iii) *Pressure ratio at full-load operating pressure.* The representative value of pressure ratio at full-load operating pressure of a basic model must be either be determined as the mean of the pressure ratio at full-load operating pressure for the units in the sample or through the application of an AEDM pursuant to the requirements of § 429.70.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to compressors; and

(2) Pursuant to § 429.12(b)(13), a certification report will include the following public product-specific information:

(i) Full-load package isentropic efficiency or part-load package isentropic efficiency, as applicable (dimensionless).

(ii) Full-load actual volume flow rate (in cubic feet per minute).

(iii) Compressor motor nominal horsepower (in horsepower).

(iv) Full-load operating pressure (in pounds per square inch, gauge).

(v) Maximum full-flow operating pressure (in pounds per square inch, gauge).

(vi) Pressure ratio at full-load operating pressure (dimensionless).

(vii) For any ancillary equipment that is installed for test, but is not part of the compressor package as distributed in commerce (per the requirements of 10 CFR part 431, subpart T, appendix A, section I(B)(4)), the following must be reported:

(A) A general description of the ancillary equipment, based on the list provided in the first column of Table 1 of 10 CFR part 431, subpart T, appendix A, section I(B)(4).

(B) The manufacturer of the ancillary equipment.

(C) The brand of the ancillary equipment (if different from the manufacturer).

(D) The model number of the ancillary equipment.

(E) The serial number of the ancillary equipment (if applicable).

(F) The following electrical characteristics, if applicable:

(*1*) Input Voltage.

(*2*) Number of Phases.

(*3*) Input Frequency.

(G) The following mechanical characteristics, if applicable:

(*1*) Size of any connections.

(*2*) Type of any connections.

(H) Installation instructions for the ancillary equipment, accompanied by photos that clearly illustrate the ancillary equipment, as installed on compressor package. Instructions and photo(s) to be provided in portable document format (*i.e.*, a PDF file).

[82 FR 1099, Jan. 4, 2017, as amended at 85 FR 1591, Jan. 10, 2020]

**§ 429.64 Electric motors.**

(a) *Applicability*. When a party determines the energy efficiency of an electric motor in order to comply with an obligation imposed on it by or pursuant to Part C of Title III of EPCA, 42 U.S.C. 6311–6316, this section applies. This section does not apply to enforcement testing conducted pursuant to § 431.383 of this subchapter. This section applies to electric motors that are subject to requirements in subpart B of part 431 of this subchapter and does not apply to dedicated-purpose pool pump motors subject to requirements in subpart Z of part 431.

(1) Prior to the date described in paragraph (a)(2) of this section, manufacturers of electric motors subject to energy conservation standards in subpart B of part 431 must make representations of energy efficiency, including representations for certification of compliance, in accordance with paragraphs (b) and (c) of this section.

(2) On and after the compliance date for any new or amended standards for electric motors published after January 1, 2021, manufacturers of electric motors subject to energy conservation standards in subpart B of part 431 of this subchapter must make representations of energy efficiency, including representations for certification of compliance, in accordance with paragraphs (d) through (f) of this section.

(3) On or after April 17, 2023, manufacturers of electric motors subject to the test procedures in appendix B of subpart B of part 431 but are subject to the energy conservation standards in subpart B of part 431 of this subchapter, must, if they chose to voluntarily make representations of energy efficiency, follow the provisions in paragraph (e) of this section.

(b) *Compliance certification*—(1) *General requirements*. The represented value of nominal full-load efficiency of each basic model of electric motor must be determined either by testing in accordance with § 431.16 of this subchapter, or by application of an alternative efficiency determination method (AEDM) that meets the requirements of paragraph (b)(2) of this section.

(2) *Alternative efficiency determination method*. In lieu of testing, the represented value of nominal full-load efficiency for a basic model of electric motor must be determined through the application of an AEDM pursuant to the requirements of § 429.70(j) and the provisions of this paragraph (b) and paragraph (c) of this section, where:

(i) The average full-load efficiency of any basic model used to validate an AEDM must be calculated under paragraph (c) of this section.

(ii) The represented value is the nominal full-load efficiency of a basic model of electric motor and is to be used in marketing materials and all public representations, as the certified value of efficiency, and on the nameplate. (*See* § 431.31(a) of this subchapter.) Determine the nominal full-load efficiency by selecting a value from the ''Nominal Full-Load Efficiency'' table in appendix B to subpart B of this part that is no greater than the simulated full-load efficiency predicted by the AEDM for the basic model.

(3) *Use of a certification program or accredited laboratory*. (i) A manufacturer may have a certification program, that DOE has classified as nationally recognized under § 429.73, certify the nominal full-load efficiency of a basic model of electric motor, and issue a certificate of conformity for the motor.

(ii) For each basic model for which a certification program is not used as described in paragraph (b)(3)(i) of this section, any testing of the motor pursuant to paragraph (b)(1) or (2) of this section to determine its energy efficiency must be carried out in an accredited laboratory that meets the requirements of § 431.18 of this subchapter;

(c) *Additional testing requirements applicable when a certification program is not used*—(1) *Selection of units for testing*. For each basic model selected for testing, a sample of units shall be selected at random and tested. Components of similar design may be substituted without requiring additional testing if the represented measures of energy consumption continue to satisfy the applicable sampling provision.

(2) *Sampling requirements*. The sample shall be comprised of production units of the basic model, or units that are representative of such production units. The sample size shall be not

fewer than five units, except that when fewer than five units of a basic model would be produced over a reasonable period of time (approximately 180 days), then each unit shall be tested. In a test of compliance with a represented average or nominal efficiency:

(i) The average full-load efficiency of the sample, which is defined by:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

where $x_i$ is the measured full-load efficiency of unit $i$ and n is the number of units tested, shall satisfy the condition:

$$\bar{x} \geq \frac{100}{1 + 1.05(\frac{100}{RE} - 1)}$$

where RE is the represented nominal full-load efficiency, and

(ii) The lowest full-load efficiency in the sample $x_{min}$, which is defined by:

$x_{min} = \min(x_i)$

shall satisfy the condition:

$$x_{min} \geq \frac{100}{1 + 1.15(\frac{100}{RE} - 1)}$$

(d) *Compliance certification.* A manufacturer may not certify the compliance of an electric motor pursuant to § 429.12 unless:

(1) Testing of the electric motor basic model was conducted using an accredited laboratory that meets the requirements of paragraph (f) of this section;

(2) Testing was conducted using a laboratory other than an accredited laboratory that meets the requirements of paragraph (f) of this section, or the nominal full-load efficiency of the electric motor basic model was determined through the application of an AEDM pursuant to the requirements of § 429.70(j), and a third-party certification organization that is nationally recognized in the United States under § 429.73 has certified the nominal full-load efficiency of the electric motor basic model through issuance of a certificate of conformity for the basic model.

(e) *Determination of represented value.* A manufacturer must determine the represented value of nominal full-load efficiency (inclusive of the inverter for inverter-only electric motors) for each basic model of electric motor either by testing in conjunction with the applicable sampling provisions or by applying an AEDM as set forth in this section and in § 429.70(j).

(1) *Testing*—(i) *Units to be tested.* If the represented value for a given basic model is determined through testing, the requirements of § 429.11 apply except that, for electric motors, the minimum sample size is five units. If fewer units than the minimum sample size are produced, each unit produced must be tested and the test results must

demonstrate that the basic model performs at or better than the applicable standard(s). If one or more units of the basic model are manufactured subsequently, compliance with the default sampling and representations provisions is required.

(ii) *Average Full-load Efficiency:* Determine the average full-load efficiency for the basic model $\bar{x}$, for the units in the sample as follows:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Where $x_i$ is the measured full-load efficiency of unit i and n is the number of units tested.

(iii) *Represented value.* The represented value is the nominal full-load efficiency of a basic model of electric motor and is to be used in marketing materials and all public representations, as the certified value of efficiency, and on the nameplate. (*See* § 431.31(a) of this subchapter.) Determine the nominal full-load efficiency by selecting an efficiency from the ''Nominal Full-load Efficiency'' table in appendix B that is no greater than the average full-load efficiency of the basic model as calculated in § 429.64(e)(1)(ii).

(iv) *Minimum full-load efficiency:* To ensure a high level of quality control and consistency of performance within the basic model, the lowest full-load efficiency in the sample $X_{min}$, must satisfy the condition:

$$x_{min} \geq \frac{100}{1 + 1.15(\frac{100}{Std} - 1)}$$

where *Std* is the value of the applicable energy conservation standard. If the lowest measured full-load efficiency of a unit in the tested sample does not satisfy the condition in this section, then the basic model cannot be certified as compliant with the applicable standard.

(2) *Alternative efficiency determination methods.* In lieu of testing, the represented value of nominal full-load efficiency for a basic model of electric motor must be determined through the application of an AEDM pursuant to the requirements of § 429.70(j) and the provisions of this section, where:

(i) The average full-load efficiency of any basic model used to validate an AEDM must be calculated under paragraph (e)(1)(ii) of this section; and

(ii) The represented value is the nominal full-load efficiency of a basic model of electric motor and is to be used in marketing materials and all public representations, as the certified value of efficiency, and on the nameplate. (See § 431.31(a) of this subchapter) Determine the nominal full-load efficiency by selecting a value from the ''Nominal Full-Load Efficiency'' table in appendix B to subpart B of this part, that is no greater than the simulated full-load efficiency predicted by the AEDM for the basic model.

(f) *Accredited laboratory.* (1) Testing pursuant to paragraphs (b)(3)(ii) and (d)(1) of this section must be conducted in an accredited laboratory for which the accreditation body was:

(i) The National Institute of Standards and Technology/National Voluntary Laboratory Accreditation Program (NIST/NVLAP); or

(ii) A laboratory accreditation body having a mutual recognition arrangement with NIST/NVLAP; or

(iii) An organization classified by the Department, pursuant to § 429.74, as an accreditation body.

(2) NIST/NVLAP is under the auspices of the National Institute of Standards and Technology (NIST)/National Voluntary Laboratory Accreditation Program (NVLAP), which is part of the U.S. Department of Commerce. NIST/NVLAP accreditation is granted on the basis of conformance with criteria published in 15 CFR part 285. The National Voluntary Laboratory Accreditation Program, ''Procedures and General Requirements,'' NIST Handbook 150–10, April 2020 (referenced for guidance only, *see* § 429.3) present the technical requirements of NVLAP for the Efficiency of Electric Motors field of accreditation. This handbook supplements NIST Handbook 150, National Voluntary Laboratory Accreditation Program ''Procedures and General Requirements,'' which contains 15 CFR part 285 plus all general NIST/NVLAP procedures, criteria, and policies. Information regarding NIST/NVLAP and its Efficiency of Electric Motors Program (EEM) can be obtained from NIST/NVLAP, 100 Bureau Drive, Mail Stop 2140, Gaithersburg, MD 20899–2140, (301) 975–4016 (telephone), or (301) 926–2884 (fax).

[87 FR 63647, Oct. 19, 2022]

### § 429.65 Dedicated-purpose pool pump motors.

(a) *Applicability*. This section applies to dedicated purpose motors that are subject to requirements in subpart Z of part 431 of this subchapter. Starting on the compliance date for any standards for dedicated-purpose pool pump motors published after January 1, 2021, manufacturers of dedicated-purpose pool pump motors subject to such standards must make representations of energy efficiency, including representations for certification of compliance, in accordance with this section. Prior to the compliance date for any standards for dedicated-purpose pool pump motors published after January 1, 2021, and on or after April 17, 2023, manufacturers of dedicated-purpose pool pump motors subject to test procedures in subpart Z of part 431 of this subchapter choosing to make representations of energy efficiency must follow the provisions in paragraph (c) of this section.

(b) *Compliance certification*. A manufacturer may not certify the compliance of a dedicated-purpose pool pump motor pursuant to 10 CFR 429.12 unless:

(1) Testing of the dedicated-purpose pool pump motor basic model was conducted using an accredited laboratory that meets the requirements of paragraph (d) of this section;

(2) Testing was conducted using a laboratory other than an accredited laboratory that meets the requirements of paragraph (d) of this section, or the full-load efficiency of the dedicated-purpose pool pump motor basic model was determined through the application of an AEDM pursuant to the requirements of § 429.70(k), and a third-party certification organization that is nationally recognized in the United States under § 429.73 has certified the full-load efficiency of the dedicated-purpose pool pump motor basic model through issuance of a certificate of conformity for the basic model.

(c) *Determination of represented value*. A manufacturer must determine the represented value of full-load efficiency (inclusive of the drive, if the dedicated-purpose pool pump motor basic model is placed into commerce with a drive, or is unable to operate without the presence of a drive) for each basic model of dedicated-purpose pool pump motor either by testing in conjunction with the applicable sampling provisions or by applying an AEDM as set forth in this section and in § 429.70(k).

(1) *Testing*—(i) *Units to be tested*. If the represented value for a given basic model is determined through testing, the requirements of § 429.11 apply except that, for dedicated-purpose pool pump motors, the minimum sample size is five units. If fewer units than the minimum sample size are produced, each unit produced must be tested and the test results must demonstrate that the basic model performs at or better than the applicable standard(s). If one or more units of the basic model are manufactured subsequently, compliance with the default sampling and representations provisions is required.

(ii) *Full-load efficiency.* Any value of full-load efficiency must be lower than or equal to the average of the sample $\bar{x}$, calculated as follows:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Where $x_i$ is the measured full-load efficiency of unit i and n is the number of units tested in the sample.

(iii) *Represented value.* The represented value is the full-load efficiency of a basic model of dedicated-purpose pool pump motor and is to be used in marketing materials and all public representations, as the certified value of efficiency, and on the nameplate. (*See* § 431.486 of this subchapter). Alternatively, a manufacturer may make representations using the nominal full-load efficiency of a basic model of dedicated-purpose pool pump motor provided that the manufacturer uses the nominal full-load efficiency consistently on all marketing materials, and as the value on the nameplate. Determine the nominal full-load efficiency by selecting an efficiency from the ''Nominal Full-load Efficiency'' table in appendix B to subpart B of this part, that is no greater than the full-load efficiency of the basic model as calculated in § 429.65(c)(1)(ii).

(iv) *Minimum full-load efficiency:* To ensure quality control and consistency of performance within the basic model, the lowest full-load efficiency in the sample $X_{min}$, must satisfy the condition:

$$x_{min} \geq \frac{100}{1 + 1.15(\frac{100}{Std} - 1)}$$

where *Std* is the value of any applicable energy conservation standard. If the lowest measured full-load efficiency of a motor in the tested sample does not satisfy the condition in this section, then the basic model cannot be certified as compliant with the applicable standard.

(v) *Dedicated-purpose pool pump motor total horsepower.* The represented value of the total horsepower of a basic model of dedicated-purpose pool pump motor must be the mean of the dedicated-purpose pool pump motor total horsepower for each tested unit in the sample.

(2) *Alternative efficiency determination methods.* In lieu of testing, the represented value of full-load efficiency for a basic model of dedicated-purpose pool pump motor must be determined through the application of an AEDM pursuant to the requirements of § 429.70(k) and the provisions of this section, where:

(i) The full-load efficiency of any basic model used to validate an AEDM must be calculated under paragraph (c)(1)(ii) of this section; and

(ii) The represented value is the full-load efficiency of a basic model of dedicated-purpose pool pump motor and is to be used in marketing materials and all public representations, as the certified value of efficiency, and on the nameplate. (*See* § 431.485 of this subchapter). Alternatively, a manufacturer may make representations using the nominal full-load efficiency of a basic model of dedicated-purpose pool pump motor provided that the manufacturer uses the nominal full-load efficiency consistently on all marketing materials, and as the value on the nameplate. Determine the nominal

full-load efficiency by selecting an efficiency from the ''Nominal Full-load Efficiency'' table in appendix B to subpart B of this part, that is no greater than the full-load efficiency of the basic model as calculated in § 429.65(c)(1)(ii).

(d) *Accredited laboratory*. (1) Testing pursuant to paragraph (b) of this section must be conducted in an accredited laboratory for which the accreditation body was:

(i) The National Institute of Standards and Technology/National Voluntary Laboratory Accreditation Program (NIST/NVLAP); or

(ii) A laboratory accreditation body having a mutual recognition arrangement with NIST/NVLAP; or

(iii) An organization classified by the Department, pursuant to § 429.74, as an accreditation body.

(2) NIST/NVLAP is under the auspices of the National Institute of Standards and Technology (NIST)/National Voluntary Laboratory Accreditation Program (NVLAP), which is part of the U.S. Department of Commerce. NIST/NVLAP accreditation is granted on the basis of conformance with criteria published in 15 CFR part 285. The National Voluntary Laboratory Accreditation Program, ''Procedures and General Requirements,'' NIST Handbook 150–10, April 2020, (referenced for guidance only, *see* § 429.3) present the technical requirements of NVLAP for the Efficiency of Electric Motors field of accreditation. This handbook supplements NIST Handbook 150, National Voluntary Laboratory Accreditation Program ''Procedures and General Requirements,'' which contains 15 CFR part 285 plus all general NIST/NVLAP procedures, criteria, and policies. Information regarding NIST/NVLAP and its Efficiency of Electric Motors Program (EEM) can be obtained from NIST/NVLAP, 100 Bureau Drive, Mail Stop 2140, Gaithersburg, MD 20899–2140, (301) 975–4016 (telephone), or (301) 926–2884 (fax).

(e) *Certification reports for dedicated purpose pool pump motors*. (1) The requirements of § 429.12 apply to dedicated-purpose pool pump motors.

(2) Pursuant to § 429.12(b)(13), a certification report must include the following public, product-specific information for each basic model:

(i) The dedicated-purpose pool pump motor total horsepower as described in paragraph (c)(1)(v) of this section;

(ii) For all basic models with total horsepower less than 0.5 THP, the full-load efficiency in percent (%) as described in this section; and

(iii) For all basic models with total horsepower greater than or equal to 0.5 THP: a statement confirming that the motor is a variable speed control dedicated purpose pool pump motor, as defined at § 431.483 of this chapter; and a statement regarding whether freeze protection is shipped enabled or disabled; for dedicated-purpose pool pump motors distributed in commerce with freeze protection controls enabled: The default dry-bulb air temperature setting (in °F), default run time setting (in minutes), maximum operating speed (in revolutions per minute, or rpm), and default motor speed in freeze protection mode (in revolutions per minute, or rpm).

(f) *Rounding requirements*. (1) Round dedicated-purpose-pool pump motor total horsepower to the nearest hundredth of a THP;

(2) Round full-load efficiency to the nearest tenth of a percent; and

(3) For dedicated-purpose pool pump motor basic models with total horsepower greater than or equal to 0.5 THP and distributed in commerce with freeze protection controls enabled, round the dry-bulb temperature setting, run time setting, maximum operating speed, and default motor speed in freeze protection mode to the nearest whole number.

[87 FR 63648, Oct. 19, 2022, as amended at 89 FR 82068, Oct. 9, 2024]

### § 429.66 General service incandescent lamps.

NOTE 1 TO § 429.66: Prior to February 17, 2023, certification reports must be submitted as required either in this section or 10 CFR 429.27 as it appears in the 10 CFR parts 200 through 499 edition revised as of January 1, 2022. On or after February 17, 2023, certification reports must be submitted as required in this section.

(a) *Determination of Represented Value*. Each manufacturer must determine represented values, which include certified ratings, for each basic model by

testing in accordance with the following sampling provisions.

(1) Units to be tested.

(i) When testing, use a sample comprised of production units. The same sample of units must be tested and used as the basis for representations for initial lumen output, rated wattage, color rendering index (CRI), correlated color temperature (CCT), and lifetime.

(ii) For each basic model, randomly select and test a sample of sufficient size, but not less than 10 units, to ensure that—

(A) Represented values of initial lumen output and CRI are less than or equal to the lower of:

(*1*) The arithmetic mean of the sample: or,

(*2*) The lower 95 percent confidence limit (LCL) of the true mean divided by .97, where:

$$LCL = \bar{x} - t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from Appendix A).

(B) Represented values of rated wattage are greater than or equal to the higher of:

(*1*) The arithmetic mean of the sample: or,

(*2*) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.03, where:

$$UCL = \bar{x} + t_{.95}\left(\frac{s}{\sqrt{n}}\right)$$

and $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from appendix A to this subpart).

(2) Any represented values of measures of energy efficiency or energy consumption for all individual models represented by a given basic model must be the same.

(3) Represented values of CCT must be equal to the arithmetic mean of the sample.

(4) Represented values of lifetime must be equal to or less than the median time to failure of the sample (calculated as the arithmetic mean of the time to failure of the two middle sample units (or the value of the middle sample unit if there are an odd number of units) when the measured values are sorted in value order).

(5) Calculate represented values of life (in years) by dividing the represented lifetime of these lamps as determined in paragraph (a)(4) of this section by the estimated daily operating hours as specified in 16 CFR 305.23(b)(3)(iii) multiplied by 365.

(6) Represented values of the estimated annual energy cost, expressed in dollars per year, must be the product of the rated wattage in kilowatts, an electricity cost rate as specified in 16 CFR 305.23(b)(1)(ii), and an estimated average daily use as specified in 16 CFR 305.23(b)(1)(ii) multiplied by 365.

(b) *Certification reports.* (1) The requirements of § 429.12 apply to general service incandescent lamps; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information: The testing laboratory's ILAC accreditation body's identification number or other approved identification assigned by the ILAC accreditation body, rated wattage in watts (W), the lifetime in hours, CRI, and initial lumen output in lumens (lm).

(c) *Rounding Requirements.* (1) Round rated wattage to the nearest tenth of a watt.

(2) Round initial lumen output to three significant digits.

(3) Round CCT to the nearest 100 kelvin (K).

(4) Round CRI to the nearest whole number.

(5) Round lifetime to the nearest whole hour.

(6) Round life (in years) to the nearest tenth.

(7) Round annual energy cost to the nearest cent.

[87 FR 53639, Aug. 31, 2022]

### § 429.67 Air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 British thermal units per hour and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 British thermal units per hour.

(a) *Applicability.* (1) For air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h subject to standards in terms of seasonal energy efficiency ratio (SEER) and heating seasonal performance factor (HSPF), representations with respect to the energy use or efficiency, including compliance certifications, are subject to the requirements in § 429.43 of this title as it appeared in the 10 CFR parts 200–499 edition revised as of January 1, 2021.

(2) For air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h subject to standards in terms of seasonal energy efficiency ratio 2 (SEER2) and heating seasonal performance factor 2 (HSPF2) metrics, representations with respect to the energy use or efficiency, including compliance certifications, are subject to the requirements in this section. If manufacturers choose to certify compliance with any standards in terms of SEER2 and HSPF2 prior to the applicable compliance date for those standards, the requirements of this section must be followed.

(b) *Determination of Represented Value*—(1) *Required represented values.* Determine the represented values (including SEER2, HSPF2, cooling capacity, and heating capacity, as applicable) for the individual models/combinations (or ''tested combinations'') specified in table 1 to this paragraph (b)(1).

TABLE 1 TO PARAGRAPH (b)(1)

| Category | Equipment subcategory | Required represented values |
|---|---|---|
| Single-Package unit | Single-Package AC (including Space-Constrained). | Every individual model distributed in commerce. |
| | Single-Package HP (including Space-Constrained). | |

TABLE 1 TO PARAGRAPH (b)(1)—Continued

| Category | Equipment subcategory | Required represented values |
|---|---|---|
| Outdoor Unit and Indoor Unit (Distributed in Commerce by OUM (Outdoor Unit Manufacturer)). | Single-Split-System AC with Single-Stage or Two-Stage Compressor (including Space-Constrained and Small-Duct, High Velocity Systems (SDHV)). | Every individual combination distributed in commerce. Each model of outdoor unit must include a represented value for at least one coil-only individual combination that is distributed in commerce and which is representative of the least efficient combination distributed in commerce with that particular model of outdoor unit. For that particular model of outdoor unit, additional represented values for coil-only and blower-coil individual combinations are allowed, if distributed in commerce. |
| | Single-Split-System AC with Other Than Single-Stage or Two-Stage Compressor (including Space-Constrained and SDHV). | Every individual combination distributed in commerce, including all coil-only and blower coil combinations. |
| | Single-Split-System HP (including Space-Constrained and SDHV). | Every individual combination distributed in commerce. |
| | Multi-Split, Multi-Circuit, or Multi-Head Mini-Split Split System—non-SDHV (including Space-Constrained). | For each model of outdoor unit, at a minimum, a non-ducted ''tested combination.'' For any model of outdoor unit also sold with models of ducted indoor units, a ducted ''tested combination.'' When determining represented values on or after the compliance date of any amended energy conservation standards, the ducted ''tested combination'' must comprise the highest static variety of ducted indoor unit distributed in commerce (i.e., conventional, mid-static, or low-static). Additional representations are allowed, as described in paragraph (d)(3) of this section. |
| | Multi-Split, Multi-Circuit, or Multi-Head Mini-Split Split System—SDHV. | For each model of outdoor unit, an SDHV ''tested combination.'' Additional representations are allowed, as described in paragraph (d)(3) of this section. |
| Indoor Unit Only Distributed in Commerce by ICM (Independent Coil Manufacturer). | Single-Split-System Air Conditioner (including Space-Constrained and SDHV). | Every individual combination distributed in commerce. |
| | Single-Split-System Heat Pump (including Space-Constrained and SDHV). | |
| | Multi-Split, Multi-Circuit, or Multi-Head Mini-Split Split System—SDHV. | For a model of indoor unit within each basic model, a SDHV ''tested combination.'' Additional representations are allowed, as described in section (d)(3)(ii) of this section. |
| Outdoor Unit with no Match | | Every model of outdoor unit distributed in commerce (tested with a model of coil-only indoor unit as specified in paragraph (c)(2) of this section). |

(2) *Refrigerants.* (i) If a model of outdoor unit (used in a single-split, multi-split, multi-circuit, multi-head mini-split, and/or outdoor unit with no match system) is distributed in commerce and approved for use with multiple refrigerants, a manufacturer must determine all represented values for that model using each refrigerant that can be used in an individual combination of the basic model (including outdoor units with no match or ''tested combinations''). This requirement may apply across the listed categories in table 1 to paragraph (b)(1) of this section. A refrigerant is considered approved for use if it is listed on the nameplate of the outdoor unit. If any of the refrigerants approved for use is HCFC–22 or has a 95 °F midpoint saturation absolute pressure that is ±18 percent of the 95 °F saturation absolute

pressure for HCFC–22, or if there are no refrigerants designated as approved for use, a manufacturer must determine represented values (including SEER2, HSPF2, cooling capacity, and heating capacity, as applicable) for, at a minimum, an outdoor unit with no match. If a model of outdoor unit is not charged with a specified refrigerant from the point of manufacture or if the unit is shipped requiring the addition of more than two pounds of refrigerant to meet the charge required for testing per Section 5.1.8 of AHRI 210/240–2023 (incorporated by reference, see § 429.4) (unless either {a} the factory charge is equal to or greater than 70 percent of the outdoor unit internal volume multiplied by the liquid density of refrigerant at 95 °F or {b} an A2L refrigerant is approved for use and listed in the certification report), a manufacturer must determine represented values (including SEER2, HSPF2, cooling capacity, and heating capacity, as applicable) for, at a minimum, an outdoor unit with no match.

(ii) If a model is approved for use with multiple refrigerants, a manufacturer may make multiple separate representations for the performance of that model (all within the same individual combination or outdoor unit with no match) using the multiple approved refrigerants. In the alternative, manufacturers may certify the model (all within the same individual combination or outdoor unit with no match) with a single representation, provided that the represented value is no more efficient than its performance using the least-efficient refrigerant. A single representation made for multiple refrigerants may not include equipment in multiple categories or equipment subcategories listed in table 1 to paragraph (b)(1) of this section.

(3) *Limitations for represented values of individual combinations.* Paragraph (b)(3)(i) of this section explains the limitations for represented values of individual combinations (or ''tested combinations'').

(i) *Multiple product classes.* Models of outdoor units that are rated and distributed in individual combinations that span multiple product classes must be tested, rated, and certified pursuant to paragraph (b) of this section as compliant with the applicable standard for each product class.

(ii) Reserved.

(4) *Requirements.* All represented values under paragraph (b) of this section must be based on testing in accordance with the requirements in paragraph (c) of this section or the application of an AEDM or other methodology as allowed in paragraph (d) of this section.

(c) *Units tested*—(1) *General.* The general requirements of § 429.11 apply to air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h, and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h; and

(2) *Sampling plans and represented values.* For individual models (for single-package systems) or individual combinations (for split-systems, including ''tested combinations'' for multi-split, multi-circuit, and multi-head mini-split systems) with represented values determined through testing, each individual model/combination (or ''tested combination'') must have a sample of sufficient size tested in accordance with the applicable provisions of this subpart. For heat pumps (other than heating-only heat pumps), all units of the sample population must be tested in both the cooling and heating modes and the results used for determining all representations. The represented values for any individual model/combination must be assigned such that:

(i) *SEER2 and HSPF2.* Any represented value of the energy efficiency or other measure of energy consumption for which consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; $n$ is the number of samples; and $x_i$ is the ith sample; or,

(B) The lower 90 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.90}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; $s$ is the sample standard deviation; $n$ is the number of samples; and $t_{0.90}$ is the t statistic for a 90 percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A of this subpart). Round represented values of SEER2 and HSPF2 to the nearest 0.05.

(ii) *Cooling Capacity and Heating Capacity.* The represented values of cooling capacity and heating capacity must each be a self-declared value that is:

(A) Less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and, $\bar{x}$ is the sample mean; $n$ is the number of samples; and $x_i$ is the $i^{th}$ sample; or,

(*2*) The lower 90 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{.90}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; $s$ is the sample standard deviation; $n$ is the number of samples; and $t_{0.90}$ is the Student's t-Distribution Values for a 90 percent one-tailed confidence interval with n−1 degrees of freedom (from appendix A to this subpart).

(B) Rounded according to:

(*1*) The nearest 100 Btu/h if cooling capacity or heating capacity is less than 20,000 Btu/h,

(*2*) The nearest 200 Btu/h if cooling capacity or heating capacity is greater than or equal to 20,000 Btu/h but less than 38,000 Btu/h, and

(*3*) The nearest 500 Btu/h if cooling capacity or heating capacity is greater than or equal to 38,000 Btu/h and less than 65,000 Btu/h.

(d) *Determination of represented values*—(1) *All basic models except outdoor units with no match and multi-split systems, multi-circuit systems, and multi-head mini-split systems.* For every individual model/combination within a basic model, either—

(i) A sample of sufficient size, comprised of production units or representing production units, must be tested as complete systems with the resulting represented values for the individual model/combination obtained in accordance with paragraphs (c)(1) and (2) of this section; or

(ii) The represented values of the measures of energy efficiency or energy consumption through the application of an AEDM in accordance with paragraph (e) of this section and § 429.70.

(2) *Outdoor units with no match.* All models of outdoor units with no match within a basic model must be tested with a model of coil-only indoor unit meeting the requirements of Section 5.1.6.2 of AHRI 210/240–2023. Models of outdoor units with no match may not be rated with an AEDM, other than to determine the represented values for models using approved refrigerants other than the one used in testing.

(3) *For multi-split systems, multi-circuit systems, and multi-head mini-split systems.* The following applies:

(i) For each non-SDHV basic model, at a minimum, a manufacturer must test the model of outdoor unit with a

''tested combination'' composed entirely of non-ducted indoor units. For any models of outdoor units also sold with models of ducted indoor units, a manufacturer must test a second ''tested combination'' composed entirely of ducted indoor units (in addition to the non-ducted combination). The ducted ''tested combination'' must comprise the highest static variety of ducted indoor unit distributed in commerce (*i.e.*, conventional, mid-static, or low-static).

(ii) If a manufacturer chooses to make representations of a variety of a basic model (*i.e.*, conventional, low static, or mid-static) other than a variety for which a representation is required under paragraph (b)(1) of this section the manufacturer must conduct testing of a tested combination according to the requirements in paragraphs (c)(1) and (2) of this section.

(iii) For basic models that include mixed combinations of indoor units (*i.e.*, combinations that are comprised of any two of the following varieties—non-ducted, low-static, mid-static, and conventional ducted indoor units), the represented value for the mixed combination is the mean of the represented values for the individual component combinations as determined in accordance with paragraphs (c)(1) and (2) and (d)(3)(i) and (ii) of this section.

(iv) For each SDHV basic model distributed in commerce by an OUM, the OUM must, at a minimum, test the model of outdoor unit with a ''tested combination'' composed entirely of SDHV indoor units. For each SDHV basic model distributed in commerce by an ICM, the ICM must test the model of indoor unit with a ''tested combination'' composed entirely of SDHV indoor units, where the outdoor unit is the least efficient model of outdoor unit with which the SDHV indoor unit will be paired. The least efficient model of outdoor unit is the model of outdoor unit in the lowest SEER2 combination as certified by the outdoor unit manufacturer. If there are multiple outdoor unit models with the same lowest SEER2 represented value, the indoor coil manufacturer may select one for testing purposes.

(v) For basic models that include SDHV and an indoor unit of another variety (*i.e.*, non-ducted, low-static, mid-static, and conventional ducted), the represented value for the mixed SDHV/other combination is the mean of the represented values for the SDHV and other tested combination as determined in accordance with paragraphs (c)(1) and (2) and paragraphs (d)(3)(i) through (ii) of this section.

(vi) All other individual combinations of models of indoor units for the same model of outdoor unit for which the manufacturer chooses to make representations must be rated as separate basic models, and the provisions of paragraphs (c)(1) and (2) and (d)(3)(i) through (v) of this section apply.

(e) *Alternative efficiency determination methods.* In lieu of testing, represented values of efficiency or consumption may be determined through the application of an AEDM pursuant to the requirements of § 429.70(l) and the provisions of this section.

(1) *Energy efficiency.* Any represented value of the SEER2, HSPF2, or other measure of energy efficiency of an individual model/combination for which consumers would favor higher values must be less than or equal to the output of the AEDM but no less than the standard.

(2) *Cooling capacity.* The represented value of cooling capacity of an individual model/combination must be no greater than the cooling capacity output simulated by the AEDM.

(3) *Heating capacity.* The represented value of heating capacity of an individual model/combination must be no greater than the heating capacity output simulated by the AEDM.

(f) *Certification reports.* This paragraph specifies the information that must be included in a certification report.

(1) The requirements of § 429.12; and

(2) Pursuant to § 429.12(b)(13), for each individual model (for single-package systems) or individual combination (for split-systems, including outdoor units with no match and ''tested combinations'' for multi-split, multi-circuit, and multi-head mini-split systems), a certification report must include the following public equipment-specific information:

(i) Commercial package air conditioning equipment that is air-cooled

with a cooling capacity of less than 65,000 Btu/h (3-Phase):

(A) When certifying compliance with a SEER standard: The seasonal energy efficiency ratio (SEER in British thermal units per Watt-hour (Btu/Wh)), and the rated cooling capacity in British thermal units per hour (Btu/h).

(B) When certifying compliance with a SEER2 standard: the seasonal energy efficiency ratio 2 (SEER2 in British thermal units per Watt-hour (Btu/Wh)) and the rated cooling capacity in British thermal units per hour (Btu/h).

(ii) Commercial package heating equipment that is air-cooled with a cooling capacity of less than 65,000 Btu/h (3-Phase):

(A) When certifying compliance with an HSPF standard: The seasonal energy efficiency ratio (SEER in British thermal units per Watt-hour (Btu/Wh)), the heating seasonal performance factor (HSPF in British thermal units per Watt-hour (Btu/Wh)), and the rated cooling capacity in British thermal units per hour (Btu/h).

(B) When certifying compliance with an HSPF2 standard: the seasonal energy efficiency ratio 2 (SEER2 in British thermal units per Watt-hour (Btu/Wh)), the heating seasonal performance factor 2 (HSPF2 in British thermal units per Watt-hour (Btu/Wh)) and the rated cooling capacity in British thermal units per hour (Btu/h).

(iii) Air-cooled, three-phase, variable refrigerant flow multi-split air conditioners with a cooling capacity of less than 65,000 Btu/h:

(A) When certifying compliance with a SEER standard: The seasonal energy efficiency ratio (SEER in British thermal units per Watt-hour (Btu/Wh)), and the rated cooling capacity in British thermal units per hour (Btu/h).

(B) When certifying compliance with a SEER2 standard: the seasonal energy efficiency ratio 2 (SEER2 in British thermal units per Watt-hour (Btu/Wh)) and the rated cooling capacity in British thermal units per hour (Btu/h).

(iv) Air-cooled, three-phase, variable refrigerant flow multi-split heat pumps with a cooling capacity of less than 65,000 Btu/h:

(A) When certifying compliance with an HSPF standard: The seasonal energy efficiency ratio (SEER in British thermal units per Watt-hour (Btu/Wh)), the heating seasonal performance factor (HSPF in British thermal units per Watt-hour (Btu/Wh)), and the rated cooling capacity in British thermal units per hour (Btu/h).

(B) When certifying compliance with an HSPF2 standard: the seasonal energy efficiency ratio 2 (SEER2 in British thermal units per Watt-hour (Btu/Wh)), the heating seasonal performance factor 2 (HSPF2 in British thermal units per Watt-hour (Btu/Wh)) and the rated cooling capacity in British thermal units per hour (Btu/h).

(3) Pursuant to § 429.12(b)(13), for each individual model/combination (including outdoor units with no match and ''tested combinations''), a certification report must include supplemental information submitted in PDF format. The equipment-specific, supplemental information must include any additional testing and testing set up instructions (e.g., charging instructions) for the basic model; identification of all special features that were included in rating the basic model; and all other information (e.g., operational codes or component settings) necessary to operate the basic model under the required conditions specified by the relevant test procedure. A manufacturer may also include with a certification report other supplementary items in PDF format (e.g., manuals) for DOE consideration in performing testing under subpart C of this part. The equipment-specific, supplemental information must include at least the following:

(i) Air cooled commercial package air conditioning equipment with a cooling capacity of less than 65,000 Btu/h (3-phase): The nominal cooling capacity in British thermal units per hour (Btu/h); rated airflow in standard cubic feet per minute (SCFM) for each fan coil; rated external static pressure in inches of water; refrigeration charging instructions (*e.g.*, refrigerant charge, superheat and/or subcooling temperatures); frequency or control set points for variable speed components (*e.g.*, compressors, VFDs); required dip switch/control settings for step or variable components; a statement whether

the model will operate at test conditions without manufacturer programming; any additional testing instructions, if applicable; if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating; and which, if any, special features were included in rating the basic model. Additionally, when certifying compliance with a SEER2 standard, the supplemental information must also include: for models of outdoor units with no match, the following characteristics of the indoor coil: the face area, the coil depth in the direction of airflow, the fin density (fins per inch), the fin material, the fin style, the tube diameter, the tube material, and the numbers of tubes high and deep.

(ii) *Commercial package heating equipment that is air-cooled with a cooling capacity of less than 65,000 Btu/h (3-phase):* The nominal cooling capacity in British thermal units per hour (Btu/h); rated heating capacity in British thermal units per hour (Btu/h); rated airflow in standard cubic feet per minute (SCFM) for each fan coil; rated external static pressure in inches of water; refrigeration charging instructions (*e.g.,* refrigerant charge, superheat and/or subcooling temperatures); frequency or control set points for variable speed components (*e.g.,* compressors, VFDs); required dip switch/control settings for step or variable components; a statement whether the model will operate at test conditions without manufacturer programming; any additional testing instructions, if applicable; if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating; and which, if any, special features were included in rating the basic model. Additionally, when certifying compliance with an HSPF2 standard, the supplemental information must also include: for models of outdoor units with no match, the following characteristics of the indoor coil: the face area, the coil depth in the direction of airflow, the fin density (fins per inch), the fin material, the fin style, the tube diameter, the tube material, and the numbers of tubes high and deep.

(iii) Variable refrigerant flow multi-split air conditioners that are air-cooled with a cooling capacity of less than 65,000 Btu/h (3-Phase): The nominal cooling capacity in British thermal units per hour (Btu/h); outdoor unit(s) and indoor units identified in the tested combination; components needed for heat recovery, if applicable; rated airflow in standard cubic feet per minute (SCFM) for each indoor unit; rated static pressure in inches of water; compressor frequency set points; required dip switch/control settings for step or variable components; a statement whether the model will operate at test conditions without manufacturer programming; any additional testing instructions, if applicable; if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating; and which, if any, special features were included in rating the basic model. Additionally, upon DOE request, the manufacturer must provide a layout of the system set-up for testing including charging instructions consistent with the installation manual.

(iv) Variable refrigerant flow multi-split heat pumps that are air-cooled with a rated cooling capacity of less than 65,000 Btu/h (3-Phase): The nominal cooling capacity in British thermal units per hour (Btu/h); rated heating capacity in British thermal units per hour (Btu/h); outdoor unit(s) and indoor units identified in the tested combination; components needed for heat recovery, if applicable; rated airflow in

standard cubic feet per minute (SCFM) for each indoor unit; rated static pressure in inches of water; compressor frequency set points; required dip switch/control settings for step or variable components; a statement whether the model will operate at test conditions without manufacturer programming; any additional testing instructions, if applicable; if a variety of motors/drive kits are offered for sale as options in the basic model to account for varying installation requirements, the model number and specifications of the motor (to include efficiency, horsepower, open/closed, and number of poles) and the drive kit, including settings, associated with that specific motor that were used to determine the certified rating; and which, if any, special features were included in rating the basic model. Additionally, upon DOE request, the manufacturer must provide a layout of the system set-up for testing including charging instructions consistent with the installation manual.

(4) The basic model number and individual model number(s) required to be reported under § 429.12(b)(6) must consist of the following:

TABLE 2 TO PARAGRAPH (f)(4)

| Equipment type | Basic model number | Individual model number(s) | | |
|---|---|---|---|---|
| | | 1 | 2 | 3 |
| Single-Package (including Space-Constrained). | Number unique to the basic model. | Package | N/A | N/A. |
| Single-Split System (including Space-Constrained and SDHV). | Number unique to the basic model. | Outdoor Unit. | Indoor Unit | If applicable—Air Mover (could be same as indoor unit if fan is part of indoor unit model number). |
| Multi-Split, Multi-Circuit, and Multi-Head Mini-Split System (including Space-Constrained and SDHV). | Number unique to the basic model. | Outdoor Unit. | When certifying a basic model based on tested combination(s): * * *. When certifying an individual combination: Each indoor units paired with the outdoor unit. | If applicable—When certifying a basic model based on tested combination(s): * * *. When certifying an individual combination: Each air movers paired with the outdoor unit. |
| Outdoor Unit with No Match | Number unique to the basic model. | Outdoor Unit. | N/A | N/A. |

[87 FR 77317, Dec. 16, 2022, as amended at 89 FR 82068, Oct. 9, 2024]

### § 429.68 Air cleaners.

(a) *Sampling plan for selection of units for testing.* (1) The requirements of § 429.11 are applicable to air cleaners; and

(2) For each basic mode of air cleaners, a sample of sufficient size shall be randomly selected and tested to ensure that—

(i) Any represented value of annual energy consumption or other measure of energy consumption of a basic mode for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Where:

$\bar{x}$ is the sample mean;
$n$ is the number of samples; and,
$x_i$ is the $i^{th}$ sample.

Or,

(B) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.10:

$$UCL = \bar{x} + t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

Where:

$\bar{x}$ is the sample mean;
$s$ is the sample standard deviation;
$n$ is the number of samples; and,
$t_{0.95}$ is the t statistic for a 95 percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A).

And

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Where:

$\bar{x}$ is the sample mean;
$n$ is the number of samples; and,
$x_i$ is the $i^{th}$ sample.

Or,

(B) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.90:

$$LCL = \bar{x} - t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

Where:

$\bar{x}$ is the sample mean;
$s$ is the sample standard deviation;
$n$ is the number of samples; and,
$t_{0.95}$ is the t statistic for a 95 percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A).

And

(3) Any represented value of the pollen, smoke, dust, and $PM_{2.5}$ clean air delivery rate (CADR) of a basic model must be the mean of the CADR for each tested unit of the basic model. Round the mean clean air delivery rate value to the nearest whole number.

(4) Any represented value of the effective room size, in square feet, of a basic model must be calculated as the product of 1.55 and the represented smoke CADR value of the basic model as determined in paragraph (a)(3) of this section. Round the value of the effective room size, in square feet, to the nearest whole number.

(ii) Any represented value of the integrated energy factor or other measure of energy consumption of a basic mode for which consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample:

(5) Round the value of the annual energy consumption, in kWh/year, of a basic model to the nearest whole number.

(6) Round the value of the integrated energy factor of a basic model to the nearest 0.1 CADR/W.

(b) *Certification reports.* (1) The requirements of § 429.12 are applicable to air cleaners; and

(2) Pursuant to § 429.12(b)(13), a certification report shall include the following public product-specific information:

(i) Smoke clean air delivery rate (CADR) in cubic feet per minute (cfm);

(ii) Dust CADR in cfm;

(iii) $PM_{2.5}$ CADR in cfm;

(iv) Annual energy consumption in kilowatt hours per year (kWh/yr);

(v) Integrated energy factor in $PM_{2.5}$ CADR per watt; and

(vi) Effective room size in square feet.

[88 FR 14043, Mar. 6, 2023, as amended at 89 FR 82069, Oct. 9, 2024]

### § 429.69 Fans and blowers.

(a) *Determination of represented values of fans and blowers other than air circulating fans.* A manufacturer must determine the represented values for each basic model, either by testing in conjunction with the applicable sampling provisions or by applying an AEDM as set forth in this section and in § 429.70(n). Manufacturers must update represented values to account for any change in the applicable motor standards in Table 5 of § 431.25 of this chapter and certify amended values as of the next annual certification (as applicable).

(1) *Testing.* (i) If the represented values for a given basic model are determined through testing, a sample of at least one unit must be selected and the requirements of § 429.11 apply.

(ii) If only one unit is tested, at each duty point characterized by a flow and speed value, any represented value of fan electrical power (''FEP''), fan shaft input power, or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the tested value. Represented values other than FEP must be rounded to the nearest hundredth. FEP must be rounded to three significant figures.

(iii) If only one unit is tested, at each duty point characterized by a flow and speed value, any represented value of fan energy index (''FEI''), or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the tested value. Represented values must be rounded to the nearest hundredth.

(iv) If more than one unit is tested, at each duty point characterized by a flow and speed value, any represented value of fan electrical input power (''FEP''), fan shaft input power, or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample, where

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Where is $\bar{x}$ the sample mean; n is the number of samples, and $x_i$ is the $i^{th}$ sample. Or,

(B) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

and $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95 percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A of subpart B of this part). Represented values other than FEP must be rounded to the nearest hundredth. FEP must be rounded to three significant figures.

(v) If more than one unit is tested, any represented value of the fan energy index (''FEI''), or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample, where

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Where $\bar{x}$ is the sample mean; n is the number of samples, and $x_i$ is the $i^{th}$ sample. Or,

(B) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

and $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95 percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A of subpart B of this part). Represented values must be rounded to the nearest hundredth.

(vi) At each duty point characterized by a flow and speed value, the representative value of static or total pressure of a basic model of must be the mean of the tested static or total pressure for each tested unit. If only one unit is tested, the representative value of static or total pressure at the duty point of a basic model is the tested value.

(2) *Alternative efficiency determination methods.* In lieu of testing, the represented values for a basic model must be determined through the application of an AEDM pursuant to the requirements of § 429.70(n) and the provisions of this section, where: the represented values of any basic model used to validate an AEDM must be calculated under paragraph (b)(1) of this section.

(b) *Determination of represented values for air circulating fans.* A manufacturer must determine the represented values for each basic model, either by testing in conjunction with the applicable sampling provisions or by applying an AEDM as set forth in this section and in § 429.70(n).

(1) *Testing.* (i) If the represented values for a given basic model are determined through testing, the requirements of § 429.11 apply.

(ii) Any represented value of fan electrical input power (''$W_E$''), or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(A) The mean of the sample, where

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Where $\bar{x}$ is the sample mean; n is the number of samples, and $x_i$ is the $i^{th}$ sample. Or,

(B) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

and $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95 percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A of subpart B of this part). Represented values must be rounded to the nearest hundredth.

(iii) Any represented value of efficacy ($Eff_{circ}$) or other measure of energy consumption of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(A) The mean of the sample, where

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Where $\bar{x}$ is the sample mean; n is the number of samples, and $x_i$ is the $i^{th}$ sample. Or,

(B) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

and $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95 percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A of subpart B of this part). Represented values must be rounded to the nearest hundredth.

(2) *Alternative efficiency determination methods.* In lieu of testing, the represented values for a basic model must be determined through the application of an AEDM pursuant to the requirements of § 429.70(n) and the provisions of this section, where: the represented values of any basic model used to validate an AEDM must be calculated under paragraph (b)(1) of this section.

[88 FR 27387, May 1, 2023, as amended at 88 FR 53375, Aug. 8, 2023]

### § 429.70 Alternative methods for determining energy efficiency and energy use.

(a) *General.* A manufacturer of covered products or covered equipment explicitly authorized to use an AEDM in §§ 429.14 through 429.69 may not distribute any basic model of such product or equipment in commerce unless the manufacturer has determined the energy consumption or energy efficiency of the basic model, either from testing the basic model in conjunction with DOE's certification sampling plans and statistics or from applying an alternative method for determining energy efficiency or energy use (*i.e.*, AEDM) to the basic model, in accordance with the requirements of this section. In instances where a manufacturer has tested a basic model to validate the AEDM, the represented value of energy consumption or efficiency of that basic model must be determined and certified according to results from actual testing in conjunction with 10 CFR part 429, subpart B certification sampling plans and statistics. In addition, a manufacturer may not knowingly use an AEDM to overrate the efficiency of a basic model.

(b) *Testing.* Testing for each covered product or covered equipment must be done in accordance with the sampling plan provisions established in § 429.11 and the testing procedures in parts 430 and 431 of this chapter.

(c) *Alternative efficiency determination method (AEDM) for commercial HVAC & WH products (excluding air-cooled, three-phase, small commercial package air conditioning and heating equipment with a*

*cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with less than 65,000 Btu/h cooling capacity), and commercial refrigerators, freezers, and refrigerator-freezers*—(1) *Criteria an AEDM must satisfy.* A manufacturer may not apply an AEDM to a basic model to determine its efficiency pursuant to this section unless:

(i) The AEDM is derived from a mathematical model that estimates the energy efficiency or energy consumption characteristics of the basic model as measured by the applicable DOE test procedure;

(ii) The AEDM is based on engineering or statistical analysis, computer simulation or modeling, or other analytic evaluation of performance data; and

(iii) The manufacturer has validated the AEDM, in accordance with paragraph (c)(2) of this section with basic models that meet the current Federal energy conservation standards.

(2) *Validation of an AEDM.* Before using an AEDM, the manufacturer must validate the AEDM's accuracy and reliability as follows:

(i) The manufacturer must select at least the minimum number of basic models for each validation class specified in paragraph (c)(2)(iv) of this section to which the particular AEDM applies. Using the AEDM, calculate the energy use or efficiency for each of the selected basic models.

(A) Except for variable refrigerant flow multi-split air conditioners and heat pumps (other than air-cooled with rated cooling capacity less than 65,000 btu/h) when certifying to standards in terms of IEER, test a single unit of each selected basic model in accordance with paragraph (c)(2)(iii) of this section. Compare the results from the single unit test and the AEDM energy use or efficiency output according to paragraph (c)(2)(ii) of this section. The manufacturer is responsible for ensuring the accuracy and reliability of the AEDM.

(B) For variable refrigerant flow multi-split air conditioners and heat pumps (other than air-cooled with rated cooling capacity less than 65,000 btu/h) when certifying to standards in terms of IEER, the following provisions apply.

(*1*) If a manufacturer makes representations for a single type of indoor unit combination (*i.e.*, only ducted, non-ducted, or SDHV indoor unit combinations) across all the basic models for which an AEDM applies, the manufacturer must test at least a single tested combination of that type of indoor unit combination for each selected basic model in accordance with paragraph (c)(2)(iii) of this section.

(*2*) If a manufacturer makes representations for two types of indoor unit combinations (*i.e.*, ducted, non-ducted, and/or SDHV) within or across all the basic models for which the AEDM applies, the manufacturer must test at least a single tested combination of a selected basic model for one of those two types of indoor unit combination, and at least a single tested combination of a different selected basic model for the other of those two types of indoor unit combination, each tested in accordance with paragraph (c)(2)(iii) of this section.

(*3*) If a manufacturer makes representations for all three types of indoor unit combinations (*i.e.*, ducted, non-ducted, and SDHV) within or across basic models for which the AEDM applies, the manufacturer must test at least a single tested combination of a selected basic model as a non-ducted tested combination and a single tested combination of a different selected basic model as a ducted tested combination, each in accordance with paragraph (c)(2)(iii) of this section.

(*4*) In all cases, compare the results from each tested basic model and the AEDM energy use or efficiency output according to paragraph (c)(2)(ii) of this section. The manufacturer is responsible for ensuring the accuracy and reliability of the AEDM.

(ii) *Individual model tolerances.* (A) For those covered products with an energy-efficiency metric, the predicted efficiency for each model calculated by applying the AEDM may not be more than five percent greater than the efficiency determined from the corresponding test of the model.

(B) For those covered products with an energy-consumption metric, the predicted energy consumption for each

model, calculated by applying the AEDM, may not be more than five percent less than the energy consumption determined from the corresponding test of the model.

(C) For all covered products, the predicted energy efficiency or consumption for each model calculated by applying the AEDM must meet or exceed the applicable federal energy conservation performance standard.

(D) An AEDM that is validated based on test results obtained from one or more field tests (pursuant to § 431.86(c)) can only be used to certify the performance of basic models of commercial packaged boilers with a certified rated input greater than 5,000,000 Btu/h.

(iii) *Additional test unit requirements.* (A) Each AEDM must be supported by test data obtained from physical tests of current models; and

(B) Test results used to validate the AEDM must meet or exceed current, applicable Federal standards as specified in part 431 of this chapter; and

(C) Each test must have been performed in accordance with the DOE test procedure specified in parts 430 or 431 of this chapter or test procedure waiver for which compliance is required at the time the basic model is distributed in commerce.

(iv) *Validation classes.*

TABLE 1 TO PARAGRAPH (c)(2)(iv)

| Validation class | Minimum number of distinct models that must be tested per AEDM |
|---|---|
| **(A) Commercial HVAC Validation Classes** | |
| Air-Cooled, Split and Packaged ACs and HPs Greater than or Equal to 65,000 Btu/h Cooling Capacity and Less than 760,000 Btu/h Cooling Capacity. | 2 Basic Models. |
| Water-Cooled, Split and Packaged ACs and HPs, All Cooling Capacities | 2 Basic Models. |
| Evaporatively-Cooled, Split and Packaged ACs and HPs, All Capacities | 2 Basic Models. |
| Water-Source HPs, All Capacities | 2 Basic Models. |
| Single Package Vertical ACs and HPs | 2 Basic Models. |
| Packaged Terminal ACs and HPs | 2 Basic Models. |
| Air-Cooled, Variable Refrigerant Flow ACs and HPs Greater than or Equal to 65,000 Btu/h Cooling Capacity. | 2 Basic Models. |
| Water-Cooled, Variable Refrigerant Flow ACs and HPs | 2 Basic Models. |
| Computer Room Air Conditioners, Air Cooled | 2 Basic Models. |
| Computer Room Air Conditioners, Water-Cooled and Glycol-Cooled | 2 Basic Models. |
| Direct Expansion-Dedicated Outdoor Air Systems, Air-cooled or Air-source Heat Pump, Without Ventilation Energy Recovery Systems. | 2 Basic Models. |
| Direct Expansion-Dedicated Outdoor Air Systems, Air-cooled or Air-source Heat Pump, With Ventilation Energy Recovery Systems. | 2 Basic Models. |
| Direct Expansion-Dedicated Outdoor Air Systems, Water-cooled, Water-source Heat Pump, or Ground Source Closed-loop Heat Pump, Without Ventilation Energy Recovery Systems. | 2 Basic Models. |
| Direct Expansion-Dedicated Outdoor Air Systems, Water-cooled, Water-source Heat Pump, or Ground Source Closed-loop Heat Pump, With Ventilation Energy Recovery Systems. | 2 Basic Models. |
| **(B) Commercial Water Heater Validation Classes** | |
| Gas-fired Water Heaters and Hot Water Supply Boilers Less than 10 Gallons | 2 Basic Models. |
| Gas-fired Water Heaters and Hot Water Supply Boilers Greater than or Equal to 10 Gallons. | 2 Basic Models. |
| Oil-fired Water Heaters and Hot Water Supply Boilers Less than 10 Gallons | 2 Basic Models. |
| Oil-fired Water Heaters and Hot Water Supply Boilers Greater than or Equal to 10 Gallons. | 2 Basic Models. |
| Electric Water Heaters | 2 Basic Models. |
| Heat Pump Water Heaters | 2 Basic Models. |
| Unfired Hot Water Storage Tanks | 2 Basic Models. |
| **(C) Commercial Packaged Boilers Validation Classes** | |
| Gas-fired, Hot Water Only Commercial Packaged Boilers | 2 Basic Models. |
| Gas-fired, Steam Only Commercial Packaged Boilers | 2 Basic Models. |
| Gas-fired Hot Water/Steam Commercial Packaged Boilers | 2 Basic Models. |
| Oil-fired, Hot Water Only Commercial Packaged Boilers | 2 Basic Models. |
| Oil-fired, Steam Only Commercial Packaged Boilers | 2 Basic Models. |

TABLE 1 TO PARAGRAPH (c)(2)(iv)—Continued

| Validation class | Minimum number of distinct models that must be tested per AEDM |
|---|---|
| Oil-fired Hot Water/Steam Commercial Packaged Boilers | 2 Basic Models. |
| **(D) Commercial Furnace Validation Classes** | |
| Gas-fired Furnaces | 2 Basic Models. |
| Oil-fired Furnaces | 2 Basic Models. |
| **(E) Commercial Refrigeration Equipment Validation Classes** [1] | |
| Self-Contained Open Refrigerators | 2 Basic Models. |
| Self-Contained Open Freezers | 2 Basic Models. |
| Remote Condensing Open Refrigerators | 2 Basic Models. |
| Remote Condensing Open Freezers | 2 Basic Models. |
| Self-Contained Closed Refrigerators | 2 Basic Models. |
| Self-Contained Closed Freezers | 2 Basic Models. |
| Remote Condensing Closed Refrigerators | 2 Basic Models. |
| Remote Condensing Closed Freezers | 2 Basic Models. |

[1] The minimum number of tests indicated above must be comprised of a transparent model, a solid model, a vertical model, a semi-vertical model, a horizontal model, and a service-over-the counter model, as applicable based on the equipment offering. However, manufacturers do not need to include all types of these models if it will increase the minimum number of tests that need to be conducted.

(3) *AEDM records retention requirements.* If a manufacturer has used an AEDM to determine representative values pursuant to this section, the manufacturer must have available upon request for inspection by the Department records showing:

(i) The AEDM, including the mathematical model, the engineering or statistical analysis, and/or computer simulation or modeling that is the basis of the AEDM;

(ii) Product information, complete test data, AEDM calculations, and the statistical comparisons from the units tested that were used to validate the AEDM pursuant to paragraph (c)(2) of this section; and

(iii) Product information and AEDM calculations for each basic model to which the AEDM has been applied.

(4) *Additional AEDM requirements.* If requested by the Department and at DOE's discretion, the manufacturer must perform at least one of the following:

(i) Conduct simulations before representatives of the Department to predict the performance of particular basic models of the product to which the AEDM was applied;

(ii) Provide analyses of previous simulations conducted by the manufacturer; or

(iii) Conduct certification testing of basic models selected by the Department.

(5) *AEDM verification testing.* DOE may use the test data for a given individual model generated pursuant to § 429.104 to verify the certified rating determined by an AEDM as long as the following process is followed:

(i) *Selection of units.* DOE will obtain units for test from retail, where available. If units cannot be obtained from retail, DOE will request that a unit be provided by the manufacturer;

(ii) *Lab requirements.* DOE will conduct testing at an independent, third-party testing facility of its choosing. In cases where no third-party laboratory is capable of testing the equipment, it may be tested at a manufacturer's facility upon DOE's request.

(iii) *Manufacturer participation.* (A) Except when testing variable refrigerant flow systems (which are governed by the rules found at § 431.96(f)), testing will be completed without a manufacturer representative on-site. In limited instances further described in paragraph (c)(5)(iii)(B) of this section, a manufacturer and DOE representative may be present to witness the test set-up.

(B) A manufacturer's representative may request to be on-site to witness the test set-up if:

(*1*) The installation manual for the basic model specifically requires it to be started only by a factory-trained installer; or

(*2*) The manufacturer has elected, as part of the certification of that basic model, to have the opportunity to witness the test set-up. A manufacturer may elect to witness the test set-up for the initial verification test for no more than 10 percent of the manufacturer's basic models submitted for certification and rated with an AEDM per validation class specified in section (c)(2)(iv) of this paragraph. The 10-percent limit applies to all of the eligible basic models submitted for certification by a given manufacturer no matter how many AEDMs a manufacturer has used to develop its ratings. The 10-percent limit is determined by first calculating 10 percent of the total number of basic models rated with an AEDM per validation class, and then truncating the resulting product. Manufacturers who have submitted fewer than 10 basic models rated with an AEDM for certification may elect to have the opportunity to witness the test set-up of one basic model. A manufacturer must identify the basic models it wishes to witness as part of its certification report(s) prior to the basic model being selected for verification testing.

(*3*) In those instances in which a manufacturer has not provided the required information as specified in § 429.12(b)(13) for a given basic model that has been rated and certified as compliant with the applicable standards, a manufacturer is precluded from witnessing the testing set up for that basic model.

(C) A DOE representative will be present for the test set-up in all cases where a manufacturer representative requests to be on-site for the test set-up. The manufacturer's representative cannot communicate with a lab representative outside of the DOE representative's presence.

(D) If DOE has obtained through retail channels a unit for test that meets either of the conditions in paragraph (c)(5)(iii)(B) of this section, DOE will notify the manufacturer that the basic model was selected for testing and that the manufacturer may have a representative present for the test set-up. If the manufacturer does not respond within five calendar days of receipt of that notification, the manufacturer waives the option to be present for test set-up, and DOE will proceed with the test set-up without a manufacturer's representative present.

(E) If DOE has obtained directly from the manufacturer a unit for test that meets either of the conditions in paragraph (c)(5)(iii)(B) of this section, DOE will notify the manufacturer of the option to be present for the test set-up at the time the unit is purchased. DOE will specify the date (not less than five calendar days) by which the manufacturer must notify DOE whether a manufacturer's representative will be present. If the manufacturer does not notify DOE by the date specified, the manufacturer waives the option to be present for the test set-up, and DOE will proceed with the test set-up without a manufacturer's representative present.

(F) DOE will review the certification submissions from the manufacturer that were on file as of the date DOE purchased a basic model (under paragraph (c)(5)(iii)(D) of this section) or the date DOE notifies the manufacturer that the basic model has been selected for testing (under paragraph (c)(5)(iii)(E) of this section) to determine if the manufacturer has indicated that it intends to witness the test set-up of the selected basic model. DOE will also verify that the manufacturer has not exceeded the allowable limit of witness testing selections as specified in paragraph (c)(5)(iii)(B)(*2*) of this section. If DOE discovers that the manufacturer exceeded the limits specified in paragraph (c)(5)(iii)(B)(*2*), DOE will notify the manufacturer of this fact and deny its request to be present for the test set-up of the selected basic model. The manufacturer must update its certification submission to ensure it has not exceeded the allowable limit of witness testing selections as specified in paragraph (c)(5)(iii)(B)(*2*) to be present at set-up for future selections. At this time DOE will also review the supplemental PDF submission(s) for the selected basic model to determine that all necessary information has been provided to the Department.

(G) If DOE determines, pursuant to paragraph (c)(5)(ii) of this section, that

the model should be tested at the manufacturer's facility, a DOE representative will be present on site to observe the test set-up and testing with the manufacturer's representative. All testing will be conducted at DOE's direction, which may include DOE-contracted personnel from a third-party lab, as well as the manufacturer's technicians.

(H) As further explained in paragraph (c)(5)(v)(B) of this section, if a manufacturer's representative is present for the initial test set-up for any reason, the manufacturer forfeits any opportunity to request a retest of the basic model. Furthermore, if the manufacturer requests to be on-site for test set-up pursuant to paragraph (c)(5)(iii)(B) of this section but is not present on site, the manufacturer forfeits any opportunity to request a retest of the basic model.

(iv) *Testing*. At no time during verification testing may the lab and the manufacturer communicate without DOE authorization. All verification testing will be conducted in accordance with the applicable DOE test procedure, as well as each of the following to the extent that they apply:

(A) Any active test procedure waivers that have been granted for the basic model;

(B) Any test procedure guidance that has been issued by DOE;

(C) The installation and operations manual that is shipped with the unit;

(D) Any additional information that was provided by the manufacturer at the time of certification (prior to DOE obtaining the unit for test); and

(E) If during test set-up or testing, the lab indicates to DOE that it needs additional information regarding a given basic model in order to test in accordance with the applicable DOE test procedure, DOE may organize a meeting between DOE, the manufacturer and the lab to provide such information.

(v) *Failure to meet certified rating*. If a model tests worse than its certified rating by an amount exceeding the tolerance prescribed in paragraph (c)(5)(vi) of this section, DOE will notify the manufacturer. DOE will provide the manufacturer with all documentation related to the test set up, test conditions, and test results for the unit. Within the timeframe allotted by DOE, the manufacturer may then:

(A) Present all claims regarding testing validity; and

(B) If the manufacturer was not on site for the initial test set-up, request a retest of the previously tested unit with manufacturer and DOE representatives on-site for the test set-up. DOE will not conduct the retest using a different unit of the same basic model unless DOE and the manufacturer determine it is necessary based on the test results, claims presented, and DOE regulations.

(vi) *Tolerances*. (A) For consumption metrics, the result from a DOE verification test must be less than or equal to the certified rating × (1 + the applicable tolerance).

(B) For efficiency metrics, the result from a DOE verification test must be greater than or equal to the certified rating × (1 − the applicable tolerance).

TABLE 2 TO PARAGRAPH (c)(5)(vi)(B)

| Equipment | Metric | Applicable tolerance |
|---|---|---|
| Commercial Packaged Boilers | Combustion Efficiency | 5% (0.05) |
| | Thermal Efficiency | 5% (0.05) |
| Commercial Water Heaters or Hot Water Supply Boilers. | Thermal Efficiency | 5% (0.05) |
| | Standby Loss | 10% (0.1) |
| Unfired Storage Tanks | R-Value | 10% (0.1) |
| Air-Cooled, Split and Packaged ACs and HPs Greater Than or Equal to 65,000 Btu/h Cooling Capacity and Less Than 760,000 Btu/h Cooling Capacity. | Energy Efficiency Ratio | 5% (0.05) |
| | Energy Efficiency Ratio 2 | 5% (0.05) |
| | Coefficient of Performance | 5% (0.05) |
| | Coefficient of Performance 2 | 5% (0.05) |
| | Integrated Energy Efficiency Ratio | 10% (0.1) |
| | Integrated Ventilation, Economizing, and Cooling | 10% (0.1) |
| | Integrated Ventilation and Heating Efficiency | 10% (0.1) |
| Water-Cooled, Split and Packaged ACs and HPs, All Cooling Capacities. | Energy Efficiency Ratio | 5% (0.05) |
| | Energy Efficiency Ratio 2 | 5% (0.05) |
| | Integrated Energy Efficiency Ratio | 10% (0.1) |
| | Integrated Ventilation, Economizing, and Cooling | 10% (0.1) |

TABLE 2 TO PARAGRAPH (c)(5)(vi)(B)—Continued

| Equipment | Metric | Applicable tolerance |
|---|---|---|
| Evaporatively-Cooled, Split and Packaged ACs and HPs, All Capacities. | Energy Efficiency Ratio | 5% (0.05) |
| | Energy Efficiency Ratio 2 | 5% (0.05) |
| | Integrated Energy Efficiency Ratio | 10% (0.1) |
| | Integrated Ventilation, Economizing, and Cooling | 10% (0.1) |
| Water-Source HPs, All Capacities | Energy Efficiency Ratio | 5% (0.05) |
| | Coefficient of Performance | 5% (0.05) |
| | Integrated Energy Efficiency Ratio | 10% (0.1) |
| Single Package Vertical ACs and HPs | Energy Efficiency Ratio | 5% (0.05) |
| | Coefficient of Performance | 5% (0.05) |
| | Integrated Energy Efficiency Ratio | 10% (0.1) |
| Packaged Terminal ACs and HPs | Energy Efficiency Ratio | 5% (0.05) |
| | Coefficient of Performance | 5% (0.05) |
| Variable Refrigerant Flow ACs and HPs (Excluding Air-Cooled, Three-phase with Less Than 65,000 Btu/h Cooling Capacity). | Energy Efficiency Ratio | 5% (0.05) |
| | Coefficient of Performance | 5% (0.05) |
| | Integrated Energy Efficiency Ratio | 10% (0.1) |
| Computer Room Air Conditioners | Sensible Coefficient of Performance | 5% (0.05) |
| | Net Sensible Coefficient of Performance | 5% (0.05) |
| Direct Expansion-Dedicated Outdoor Air Systems | Integrated Seasonal Coefficient of Performance 2 | 10% (0.1) |
| | Integrated Seasonal Moisture Removal Efficiency 2 | 10% (0.1) |
| Commercial Warm-Air Furnaces | Thermal Efficiency | 5% (0.05) |
| Commercial Refrigeration Equipment | Daily Energy Consumption | 5% (0.05) |

(vii) *Invalid rating.* If, following discussions with the manufacturer and a retest where applicable, DOE determines that the verification testing was conducted appropriately in accordance with the DOE test procedure, DOE will issue a determination that the rating for the model is invalid. The manufacturer must elect, within 15 days, one of the following to be completed in a time frame specified by DOE, which is never to exceed 180 days:

(A) Re-rate and re-certify the model based on DOE's test data alone; or

(B) Discontinue the model through the certification process; or

(C) Conduct additional testing and re-rate and re-certify the basic model based on all test data collected, including DOE's test data.

(viii) *AEDM use.* (A) If DOE has determined that a manufacturer made invalid ratings on two or more models rated using the same AEDM within a 24 month period, the manufacturer must take the action listed in the table corresponding to the number of invalid certified ratings. The twenty-four month period begins with a DOE determination that a rating is invalid through the process outlined above. Additional invalid ratings apply for the purposes of determining the appropriate consequences if the subsequent determination(s) is based on selection of a unit for testing within the twenty-four month period (i.e., subsequent determinations need not be made within 24 months).

TABLE 3 TO PARAGRAPH (C)(5)(VIII)(A)

| Number of invalid certified ratings from the same AEDM [2] within a rolling 24 month period [3] | Required manufacturer actions |
|---|---|
| 2 | Submit different test data and reports from testing to validate that AEDM within the validation classes to which it is applied.[1] Adjust the ratings as appropriate. |
| 4 | Conduct double the minimum number of validation tests for the validation classes to which the AEDM is applied. Note, the tests required under this paragraph (c)(5)(viii) must be performed on different models than the original tests required under paragraph (c)(2) of this section. |
| 6 | Conduct the minimum number of validation tests for the validation classes to which the AEDM is applied at a third-part test facility; And<br>Conduct addition testing, which is equal to ½ the minimum number of validation tests for the validation classes to which the AEDM is applied , at either the manufacturer's facility or a third-party test facility, at the manufacturer's discretion.<br>Note, the tests required under this paragraph (c)(5)(viii) must be performed on different models than the original tests performed under paragraph (c)(2) of this section. |

TABLE 3 TO PARAGRAPH (C)(5)(VIII)(A)—Continued

| Number of invalid certified ratings from the same AEDM[2] within a rolling 24 month period[3] | Required manufacturer actions |
|---|---|
| > = 8 | Manufacturer has lost privilege to use AEDM. All ratings for models within the validation classes to which the AEDM applied should be rated via testing. Distribution cannot continue until certification(s) are corrected to reflect actual test data. |

[1] A manufacturer may discuss with DOE's Office of Enforcement whether existing test data on different basic models within the validation classes to which that specific AEDM was applied may be used to meet this requirement.
[2] The ''same AEDM'' means a computer simulation or mathematical model that is identified by the manufacturer at the time of certification as having been used to rate a model or group of models.
[3] The twenty-four month period begins with a DOE determination that a rating is invalid through the process outlined above. Additional invalid ratings apply for the purposes of determining the appropriate consequences if the subsequent determination(s) is based on testing of a unit that was selected for testing within the twenty-four month period (i.e., subsequent determinations need not be made within 24 months).

(B) If, as a result of eight or more invalid ratings, a manufacturer has lost the privilege of using an AEDM for rating, the manufacturer may regain the ability to use an AEDM by:

(*1*) Investigating and identifying cause(s) for failures;

(*2*) Taking corrective action to address cause(s);

(*3*) Performing six new tests per validation class, a minimum of two of which must be performed by an independent, third-party laboratory to validate the AEDM; and

(*4*) Obtaining DOE authorization to resume use of the AEDM.

(d) *Alternative efficiency determination method for distribution transformers.* A manufacturer may use an AEDM to determine the efficiency of one or more of its untested basic models only if it determines the efficiency of at least five of its other basic models (selected in accordance with paragraph (d)(3) of this section) through actual testing.

(1) *Criteria an AEDM must satisfy.* (i) The AEDM has been derived from a mathematical model that represents the electrical characteristics of that basic model;

(ii) The AEDM is based on engineering and statistical analysis, computer simulation or modeling, or other analytic evaluation of performance data; and

(iii) The manufacturer has substantiated the AEDM, in accordance with paragraph (d)(2) of this section, by applying it to, and testing, at least five other basic models of the same type, *i.e.,* low-voltage dry-type distribution transformers, medium-voltage dry-type distribution transformers, or liquid-immersed distribution transformers.

(2) *Substantiation of an AEDM.* Before using an AEDM, the manufacturer must substantiate the AEDM's accuracy and reliability as follows:

(i) Apply the AEDM to at least five of the manufacturer's basic models that have been selected for testing in accordance with paragraph (d)(3) of this section, and calculate the power loss for each of these basic models;

(ii) Test at least five units of each of these basic models in accordance with the applicable test procedure and § 429.47, and determine the power loss for each of these basic models;

(iii) The predicted total power loss for each of these basic models, calculated by applying the AEDM pursuant to paragraph (d)(2)(i) of this section, must be within plus or minus five percent of the mean total power loss determined from the testing of that basic model pursuant to paragraph (d)(2)(ii) of this section; and

(iv) Calculate for each of these basic models the percentage that its power loss calculated pursuant to paragraph (d)(2)(i) of this section is of its power loss determined from testing pursuant to paragraph (d)(2)(ii) of this section, compute the average of these percentages, and that calculated average power loss, expressed as a percentage of the average power loss determined from testing, must be no less than 97 percent and no greater than 103 percent.

(3) *Additional testing requirements.* (i) A manufacturer must select basic models for testing in accordance with the following criteria:

(A) Two of the basic models must be among the five basic models with the highest unit volumes of production by the manufacturer in the prior year, or during the prior 12-calendar-month period beginning in 2003,[1] whichever is later;

(B) No two basic models should have the same combination of power and voltage ratings; and

(C) At least one basic model should be single-phase and at least one should be three-phase.

(ii) In any instance where it is impossible for a manufacturer to select basic models for testing in accordance with all of these criteria, the criteria shall be given priority in the order in which they are listed. Within the limits imposed by the criteria, basic models shall be selected randomly.

(4) *Subsequent verification of an AEDM.* (i) Each manufacturer that has used an AEDM under this section shall have available for inspection by the Department of Energy records showing:

(A) The method or methods used;

(B) The mathematical model, the engineering or statistical analysis, computer simulation or modeling, and other analytic evaluation of performance data on which the AEDM is based;

(C) Complete test data, product information, and related information that the manufacturer has generated or acquired pursuant to paragraph (d)(4) of this section; and

(D) The calculations used to determine the efficiency and total power losses of each basic model to which the AEDM was applied.

(ii) If requested by the Department, the manufacturer must perform at least one of the following:

(A) Conduct simulations to predict the performance of particular basic models of distribution transformers specified by the Department;

(B) Provide analyses of previous simulations conducted by the manufacturer;

(C) Conduct sample testing of basic models selected by the Department; or

(D) Conduct a combination of these.

[1] When identifying these five basic models, any basic model that does not comply with Federal energy conservation standards for distribution transformers that may be in effect shall be excluded from consideration.

(e) *Alternate Efficiency Determination Method (AEDM) for central air conditioners and heat pumps.* This paragraph (e) sets forth the requirements for a manufacturer to use an AEDM to rate central air conditioners and heat pumps.

(1) *Criteria an AEDM must satisfy.* A manufacturer may not apply an AEDM to an individual model/combination to determine its represented values (SEER, EER, HSPF, SEER2, EER2, HSPF2, and/or $P_{W,OFF}$) pursuant to this section unless authorized pursuant to § 429.16(d) and:

(i) The AEDM is derived from a mathematical model that estimates the energy efficiency or energy consumption characteristics of the individual model or combination (SEER, EER, HSPF, SEER2, EER2, HSPF2, and/or $P_{W,OFF}$) as measured by the applicable DOE test procedure; and

(ii) The manufacturer has validated the AEDM in accordance with paragraph (e)(2) of this section.

(2) *Validation of an AEDM.* Before using an AEDM, the manufacturer must validate the AEDM's accuracy and reliability as follows:

(i) Follow paragraph (e)(2)(i)(A) of this section for requirements on minimum testing. Follow paragraph (e)(2)(i)(B) of this section for requirements on ensuring the accuracy and reliability of the AEDM.

(A) *Minimum testing.* (*1*) For non-space-constrained single-split system air conditioners and heat pumps rated based on testing in accordance with appendix M to subpart B of part 430, the manufacturer must test each basic model as required under § 429.16(b)(2). Until July 1, 2024, for non-space-constrained single-split-system air conditioners and heat pumps rated based on testing in accordance with appendix M1 to subpart B of part 430, the manufacturer must test a single-unit sample from 20 percent of the basic models distributed in commerce to validate the AEDM. On or after July 1, 2024, for non-space-constrained single-split-system air conditioners and heat pumps rated based on testing in accordance with appendix M1 to subpart B of part 430, the manufacturer must complete testing of each basic model as required under § 429.16(b)(2).

(*2*) For other than non-space-constrained single-split-system air conditioners and heat pumps, the manufacturer must test each basic model as required under § 429.16(b)(2).

(B) Using the AEDM, calculate the energy use or efficiency for each of the tested individual models/combinations within each basic model. Compare the represented value based on testing and the AEDM energy use or efficiency output according to paragraph (e)(2)(ii) of this section. The manufacturer is responsible for ensuring the accuracy and reliability of the AEDM and that their representations are appropriate and the models being distributed in commerce meet the applicable standards, regardless of the amount of testing required in paragraphs (e)(2)(i)(A) and (e)(2)(i)(B) of this section.

(ii) *Individual model/combination tolerances.* This paragraph (e)(2)(ii) provides the tolerances applicable to individual models/combinations rated using an AEDM.

(A) The predicted represented values for each individual model/combination calculated by applying the AEDM may not be more than four percent greater (for measures of efficiency) or less (for measures of consumption) than the values determined from the corresponding test of the individual model/combination.

(B) The predicted energy efficiency or consumption for each individual model/combination calculated by applying the AEDM must meet or exceed the applicable federal energy conservation standard.

(iii) *Additional test unit requirements.* (A) Each AEDM must be supported by test data obtained from physical tests of current individual models/combinations; and

(B) Test results used to validate the AEDM must meet or exceed current, applicable Federal standards as specified in part 430 of this chapter; and

(C) Each test must have been performed in accordance with the applicable DOE test procedure with which compliance is required at the time the individual models/combinations used for validation are distributed in commerce.

(3) *AEDM records retention requirements.* If a manufacturer has used an AEDM to determine representative values pursuant to this section, the manufacturer must have available upon request for inspection by the Department records showing:

(i) The AEDM, including the mathematical model, the engineering or statistical analysis, and/or computer simulation or modeling that is the basis of the AEDM;

(ii) Product information, complete test data, AEDM calculations, and the statistical comparisons from the units tested that were used to validate the AEDM pursuant to paragraph (e)(2) of this section; and

(iii) Product information and AEDM calculations for each individual model/combination to which the AEDM has been applied.

(4) *Additional AEDM requirements.* If requested by the Department, the manufacturer must:

(i) Conduct simulations before representatives of the Department to predict the performance of particular individual models/combinations;

(ii) Provide analyses of previous simulations conducted by the manufacturer; and/or

(iii) Conduct certification testing of individual models or combinations selected by the Department.

(5) *AEDM verification testing.* DOE may use the test data for a given individual model/combination generated pursuant to § 429.104 to verify the represented value determined by an AEDM as long as the following process is followed:

(i) *Selection of units.* DOE will obtain one or more units for test from retail, if available. If units cannot be obtained from retail, DOE will request that a unit be provided by the manufacturer;

(ii) *Lab requirements.* DOE will conduct testing at an independent, third-party testing facility of its choosing. In cases where no third-party laboratory is capable of testing the equipment, testing may be conducted at a manufacturer's facility upon DOE's request.

(iii) *Testing.* At no time during verification testing may the lab and the manufacturer communicate without DOE authorization. If during test set-up or testing, the lab indicates to

DOE that it needs additional information regarding a given individual model or combination in order to test in accordance with the applicable DOE test procedure, DOE may organize a meeting between DOE, the manufacturer and the lab to provide such information.

(iv) *Failure to meet certified value.* If an individual model/combination tests worse than its certified value (*i.e.*, lower than the certified efficiency value or higher than the certified consumption value) by more than 5 percent, or the test results in cooling capacity that is lower than its certified cooling capacity, DOE will notify the manufacturer. DOE will provide the manufacturer with all documentation related to the test set up, test conditions, and test results for the unit. Within the timeframe allotted by DOE, the manufacturer may present any and all claims regarding testing validity.

(v) *Tolerances.* This paragraph specifies the tolerances DOE will permit when conducting verification testing.

(A) For consumption metrics, the result from a DOE verification test must be less than or equal to 1.05 multiplied by the certified represented value.

(B) For efficiency metrics, the result from a DOE verification test must be greater than or equal to 0.95 multiplied by the certified represented value.

(vi) *Invalid represented value.* If, following discussions with the manufacturer and a retest where applicable, DOE determines that the verification testing was conducted appropriately in accordance with the DOE test procedure, DOE will issue a determination that the represented values for the basic model are invalid. The manufacturer must conduct additional testing and re-rate and re-certify the individual models/combinations within the basic model that were rated using the AEDM based on all test data collected, including DOE's test data.

(vii) *AEDM use.* This paragraph (e)(5)(vii) specifies when a manufacturer's use of an AEDM may be restricted due to prior invalid represented values.

(A) If DOE has determined that a manufacturer made invalid represented values on individual models/combinations within two or more basic models rated using the manufacturer's AEDM within a 24 month period, the manufacturer must test the least efficient and most efficient individual model/combination within each basic model in addition to the individual model/combination specified in § 429.16(b)(2). The twenty-four month period begins with a DOE determination that a represented value is invalid through the process outlined above.

(B) If DOE has determined that a manufacturer made invalid represented values on more than four basic models rated using the manufacturer's AEDM within a 24-month period, the manufacturer may no longer use an AEDM.

(C) If a manufacturer has lost the privilege of using an AEDM, the manufacturer may regain the ability to use an AEDM by:

(*1*) Investigating and identifying cause(s) for failures;

(*2*) Taking corrective action to address cause(s);

(*3*) Performing six new tests per basic model, a minimum of two of which must be performed by an independent, third-party laboratory from units obtained from retail to validate the AEDM; and

(*4*) Obtaining DOE authorization to resume use of an AEDM.

(f) *Alternative efficiency determination method (AEDM) for walk-in refrigeration systems and doors*—(1) *Criteria an AEDM must satisfy.* A manufacturer may not apply an AEDM to a basic model to determine its efficiency pursuant to this section unless:

(i) The AEDM is derived from a mathematical model that estimates the energy efficiency or energy consumption characteristics of the basic model as measured by the applicable DOE test procedure;

(ii) The AEDM is based on engineering or statistical analysis, computer simulation or modeling, or other analytical evaluation of performance data; and

(iii) The manufacturer has validated the AEDM, in accordance with paragraph (f)(2) of this section.

(2) *Validation of an AEDM.* Before using an AEDM, the manufacturer must validate the AEDM's accuracy and reliability as follows:

(i) The manufacturer must select at least the minimum number of basic

models for each validation class specified in paragraph (f)(2)(iv) of this section to which the particular AEDM applies. Test a single unit of each basic model in accordance with paragraph (f)(2)(iii) of this section. Using the AEDM, calculate the energy use or energy efficiency for each of the selected basic models. Compare the results from the single unit test and the AEDM output according to paragraph (f)(2)(ii) of this section. The manufacturer is responsible for ensuring the accuracy and repeatability of the AEDM.

(ii) *Individual model tolerances.*

(A) For refrigeration systems, which are subject to an energy efficiency metric, the predicted efficiency for each model calculated by applying the AEDM may not be more than five percent greater than the efficiency determined from the corresponding test of the model.

(B) For doors, which are subject to an energy consumption metric the predicted daily energy consumption for each model calculated by applying the AEDM may not be more than five percent less than the daily energy consumption determined from the corresponding test of the model.

(C) The predicted energy efficiency or energy consumption for each model calculated by applying the AEDM must meet or exceed the applicable federal energy conservation standard.

(iii) *Additional test unit requirements.* (A) Each AEDM must be supported by test data obtained from physical tests of current models; and

(B) Test results used to validate the AEDM must meet or exceed current, applicable Federal standards as specified in part 431 of this chapter;

(C) Each test must have been performed in accordance with the applicable DOE test procedure with which compliance is required at the time the basic model is distributed in commerce; and

(D) For rating WICF refrigeration system components, an AEDM may not simulate or model portions of the system that are not required to be tested by the DOE test procedure. That is, if the test results used to validate the AEDM are for either a unit cooler only or a condensing unit only, the AEDM must estimate the system rating using the nominal values specified in the DOE test procedure for the other part of the refrigeration system.

(E) For rating doors, an AEDM may not simulate or model components of the door that are not required to be tested by the DOE test procedure. That is, if the test results used to validate the AEDM are for the U-factor test of the door, the AEDM must estimate the daily energy consumption, specifically the conduction thermal load, and the direct and indirect electrical energy consumption, using the nominal values and calculation procedure specified in the DOE test procedure.

(iv) *WICF validation classes*—(A) *Doors.*

TABLE 4 TO PARAGRAPH (f)(2)(iv)(A)

| Validation class | Minimum number of distinct models that must be tested |
|---|---|
| Display Doors, Medium Temperature | 2 Basic Models. |
| Display Doors, Low Temperature | 2 Basic Models. |
| Non-display Doors, Medium Temperature | 2 Basic Models. |
| Non-display Doors, Low Temperature | 2 Basic Models. |

(B) *Refrigeration systems.* (*1*) For representations made prior to the compliance date of revised energy conservation standards for walk-in cooler and walk-in freezer refrigeration systems, use the following validation classes.

TABLE 5 TO PARAGRAPH (f)(2)(iv)(B)(*1*)

| Validation class | Minimum number of distinct models that must be tested |
|---|---|
| Dedicated Condensing, Medium Temperature, Matched Pair Indoor System | 2 Basic Models. |
| Dedicated Condensing, Medium Temperature, Matched Pair Outdoor System [1] | 2 Basic Models. |
| Dedicated Condensing, Low Temperature, Matched Pair Indoor System | 2 Basic Models. |

TABLE 5 TO PARAGRAPH (f)(2)(iv)(B)(*1*)—Continued

| Validation class | Minimum number of distinct models that must be tested |
|---|---|
| Dedicated Condensing, Low Temperature, Matched Pair Outdoor System [1] | 2 Basic Models. |
| Unit Cooler, High-temperature | 2 Basic Models. |
| Unit Cooler, Medium Temperature | 2 Basic Models. |
| Unit Cooler, Low Temperature | 2 Basic Models. |
| Medium Temperature, Indoor Condensing Unit | 2 Basic Models. |
| Medium Temperature, Outdoor Condensing Unit [1] | 2 Basic Models. |
| Low Temperature, Indoor Condensing Unit | 2 Basic Models. |
| Low Temperature, Outdoor Condensing Unit [1] | 2 Basic Models. |

[1] AEDMs validated for an outdoor class by testing only outdoor models of that class may be used to determine representative values for the corresponding indoor class, and additional validation testing is not required. AEDMs validated only for a given indoor class by testing indoor models or a mix of indoor and outdoor models may not be used to determine representative values for the corresponding outdoor class.

(*2*) For representations made on or after the compliance date of revised energy conservation standards for walk-in cooler and walk-in freezer refrigeration systems, use the following validation classes.

TABLE 6 TO PARAGRAPH (f)(2)(iv)(B)(*2*)

| Validation class | Minimum number of distinct models that must be tested |
|---|---|
| Dedicated Condensing Unit, Medium Temperature, Indoor System | 2 Basic Models. |
| Dedicated Condensing Unit, Medium Temperature, Outdoor System [1] | 2 Basic Models. |
| Dedicated Condensing Unit, Low Temperature, Indoor System | 2 Basic Models. |
| Dedicated Condensing Unit, Low Temperature, Outdoor System [1] | 2 Basic Models. |
| Single-packaged Dedicated Condensing, High-temperature, Indoor System | 2 Basic Models. |
| Single-packaged Dedicated Condensing, High-temperature, Outdoor System [1] | 2 Basic Models. |
| Single-packaged Dedicated Condensing, Medium Temperature, Indoor System | 2 Basic Models. |
| Single-packaged Dedicated Condensing, Medium Temperature, Outdoor System [1] | 2 Basic Models. |
| Single-packaged Dedicated Condensing, Low Temperature, Indoor System | 2 Basic Models. |
| Single-packaged Dedicated Condensing, Low Temperature, Indoor System [1] | 2 Basic Models. |
| Matched Pair, High-temperature, Indoor Condensing Unit | 2 Basic Models. |
| Matched Pair, High-temperature, Outdoor Condensing Unit [1] | 2 Basic Models. |
| Matched Pair, Medium Temperature, Indoor Condensing Unit | 2 Basic Models. |
| Matched Pair, Medium Temperature, Outdoor Condensing Unit [1] | 2 Basic Models. |
| Matched Pair, Low Temperature, Indoor Condensing Unit | 2 Basic Models. |
| Matched Pair, Low Temperature, Outdoor Condensing Unit [1] | 2 Basic Models. |
| Unit Cooler, High-temperature | 2 Basic Models. |
| Unit Cooler, Medium Temperature | 2 Basic Models. |
| Unit Cooler, Low Temperature | 2 Basic Models. |

[1] AEDMs validated for an outdoor class by testing only outdoor models of that class may be used to determine representative values for the corresponding indoor class, and additional validation testing is not required. AEDMs validated only for a given indoor class by testing indoor models or a mix of indoor and outdoor models may not be used to determine representative values for the corresponding outdoor class.

(3) *AEDM records retention requirements*. If a manufacturer has used an AEDM to determine representative values pursuant to this section, the manufacturer must have available upon request for inspection by the Department records showing:

(i) The AEDM, including the mathematical model, the engineering or statistical analysis, and/or computer simulation or modeling that is the basis of the AEDM;

(ii) Equipment information, complete test data, AEDM calculations, and the statistical comparisons from the units tested that were used to validate the AEDM pursuant to paragraph (f)(2) of this section; and

(iii) Equipment information and AEDM calculations for each basic model to which the AEDM has been applied.

(4) *Additional AEDM requirements*. If requested by the Department the manufacturer must perform at least one of the following:

(i) Conduct simulations before representatives of the Department to predict the performance of particular basic models of the product to which the AEDM was applied;

(ii) Provide analyses of previous simulations conducted by the manufacturer; or

(iii) Conduct certification testing of basic models selected by the Department.

(5) *AEDM verification testing.* DOE may use the test data for a given individual model generated pursuant to § 429.104 to verify the certified rating determined by an AEDM as long as the following process is followed:

(i) *Selection of units.* DOE will obtain units for test from retail, where available. If units cannot be obtained from retail, DOE will request that a unit be provided by the manufacturer.

(ii) *Lab requirements.* DOE will conduct testing at an independent, third-party testing facility of its choosing. In cases where no third-party laboratory is capable of testing the equipment, it may be tested at a manufacturer's facility upon DOE's request.

(iii) *Manufacturer participation.* Testing will be performed without manufacturer representatives on-site.

(iv) *Testing.* All verification testing will be conducted in accordance with the applicable DOE test procedure, as well as each of the following to the extent that they apply:

(A) Any active test procedure waivers that have been granted for the basic model;

(B) Any test procedure guidance that has been issued by DOE;

(C) If during test set-up or testing, the lab indicates to DOE that it needs additional information regarding a given basic model in order to test in accordance with the applicable DOE test procedure, DOE may organize a meeting between DOE, the manufacturer and the lab to provide such information.

(D) At no time during the process may the lab communicate directly with the manufacturer without DOE present.

(v) *Failure to meet certified rating.* If a model tests worse than its certified rating by an amount exceeding the tolerance prescribed in paragraph (f)(5)(vi) of this section, DOE will notify the manufacturer. DOE will provide the manufacturer with all documentation related to the test set up, test conditions, and test results for the unit. Within the timeframe allotted by DOE, the manufacturer may then present all claims regarding testing validity.

(vi) *Tolerances.* For efficiency metrics, the result from a DOE verification test must be greater than or equal to the certified rating × (1 − the applicable tolerance). For energy consumption metrics, the result from a DOE verification test must be less than or equal to the certified rating × (1 + the applicable tolerance).

TABLE 7 TO PARAGRAPH (F)(5)(VI)

| Equipment | Metric | Applicable tolerance (%) |
|---|---|---|
| Refrigeration systems (including components) | AWEF/AWEF2 | 5 |
| Doors | Daily Energy Consumption | 5 |

(vii) *Invalid rating.* If, following discussions with the manufacturer and a retest where applicable, DOE determines that the testing was conducted appropriately in accordance with the DOE test procedure, the rating for the model will be considered invalid. Pursuant to 10 CFR 429.13(b), DOE may require a manufacturer to conduct additional testing as a remedial measure.

(g) *Alternative determination of ratings for untested basic models of residential water heaters and residential-duty commercial water heaters.* For models of water heaters that differ only in fuel type or power input, ratings for untested basic models may be established in accordance with the following procedures in lieu of testing. This method allows only for the use of ratings identical to those of a tested basic model as provided below; simulations or other modeling predictions for ratings of the uniform energy factor, volume, first-hour rating, or maximum gallons per minute (GPM) are not permitted.

(1) *Gas Water Heaters.* For untested basic models of gas-fired water heaters

that differ from tested basic models only in whether the basic models use natural gas or propane gas, the represented value of uniform energy factor, first-hour rating, and maximum gallons per minute for an untested basic model is the same as that for a tested basic model, as long as the input ratings of the tested and untested basic models are within ±10%, that is:

$$\frac{|input\ rating\ of\ untested\ basic\ model - input\ rating\ of\ tested\ basic\ model|}{input\ rating\ of\ tested\ basic\ model} \leq 10\%.$$

(2) *Electric Storage Water Heaters.* Rate an untested basic model of an electric storage-type water heater using the first-hour rating or maximum GPM (whichever is applicable under section 5.3.1 of appendix E to subpart B of this part) and uniform energy factor obtained from a tested basic model as the basis for ratings of basic models with other input ratings, provided that certain conditions are met:

(i) For an untested basic model, the represented value of the first-hour rating or maximum GPM and the uniform energy factor is the same as that of a tested basic model, provided that each heating element of the untested basic model is rated at or above the input rating for the corresponding heating element of the tested basic model.

(ii) For an untested basic model having any heating element with an input rating that is lower than that of the corresponding heating element in the tested basic model, the represented value of the first-hour rating or maximum GPM and the uniform energy factor is the same as that of a tested basic model, provided that the first-hour rating for the untested basic model results in the same draw pattern specified in Table I of appendix E for the simulated-use test as was applied to the tested basic model. To establish whether this condition is met, determine the first-hour ratings or maximum GPMs for the tested and the untested basic models in accordance with the procedure described in section 5.3 of 10 CFR part 430, subpart B, appendix E, then compare the appropriate draw pattern specified in Table I of appendix E for the first-hour rating of the tested basic model with that for the untested basic model. If this condition is not met, then the untested basic model must be tested, and the appropriate sampling provisions must be applied to determine its uniform energy factor in accordance with appendix E and this part.

(3) *Electric Instantaneous Water Heaters.* Rate an untested basic model of an electric instantaneous-type water heater using the first-hour rating or maximum GPM and the uniform energy factor obtained from a tested basic model as a basis for ratings of basic models with other input ratings, provided that certain conditions are met:

(i) For an untested basic model, the represented value of the first-hour rating or maximum GPM and the uniform energy factor is the same as that of a tested basic model, provided that the untested basic model's input is rated at or above the input rating for the corresponding tested basic model.

(ii) For an untested basic model having an input rating that is lower than that of the corresponding tested basic model, the represented value of the first-hour rating or maximum GPM and the uniform energy factor is the same as that of a tested basic model, provided that the first-hour rating or maximum GPM for the untested basic model results in the same draw pattern specified in Table II of appendix E for the 24-hour simulated-use test as was applied to the tested basic model. To establish whether this condition is met, determine the first-hour rating or maximum GPM for the tested and the untested basic models in accordance with the procedure described in section 5.3 of 10 CFR part 430, subpart B, appendix E, then compare the appropriate draw pattern specified in Table II of appendix E for the first-hour rating or maximum GPM of the tested basic model with that for the untested basic model. If this condition is not met, then the untested basic model must be tested, and the appropriate sampling

provisions must be applied to determine its uniform energy factor in accordance with appendix E and this part.

(h) *Alternative efficiency determination method (AEDM) for compressors*—(1) *Criteria an AEDM must satisfy*. A manufacturer may not apply an AEDM to a basic model to determine its efficiency pursuant to this section, unless:

(i) The AEDM is derived from a mathematical model that estimates the energy efficiency or energy consumption characteristics of the basic model as measured by the applicable DOE test procedure;

(ii) The AEDM is based on engineering or statistical analysis, computer simulation or modeling, or other analytic evaluation of performance data; and

(iii) The manufacturer has validated the AEDM, in accordance with paragraph (h)(2) of this section.

(2) *Validation of an AEDM*. Before using an AEDM, the manufacturer must validate the AEDM's accuracy and reliability as follows:

(i) *AEDM overview*. The manufacturer must select at least the minimum number of basic models for each validation class specified in paragraph (h)(2)(iv) of this section to which the particular AEDM applies. Using the AEDM, calculate the energy use or energy efficiency for each of the selected basic models. Test each basic model and determine the represented value(s) in accordance with § 429.63(a). Compare the results from the testing and the AEDM output according to paragraph (h)(2)(ii) of this section. The manufacturer is responsible for ensuring the accuracy and repeatability of the AEDM.

(ii) *AEDM basic model tolerances.* (A) The predicted representative values for each basic model calculated by applying the AEDM may not be more than five percent greater (for measures of efficiency) or less (for measures of consumption) than the represented values determined from the corresponding test of the model.

(B) The predicted package isentropic efficiency for each basic model calculated by applying the AEDM must meet or exceed the applicable federal energy conservation standard.

(iii) *Additional test unit requirements.* (A) Each AEDM must be supported by test data obtained from physical tests of current models; and

(B) Test results used to validate the AEDM must meet or exceed current, applicable Federal standards as specified in part 431 of this chapter; and

(C) Each test must have been performed in accordance with the applicable DOE test procedure with which compliance is required at the time the basic models used for validation are distributed in commerce.

(iv) *Compressor validation classes.*

TABLE 8 TO PARAGRAPH (H)(2)(IV)

| Validation class | Minimum number of distinct basic models that must be tested |
|---|---|
| Rotary, Fixed-speed | 2 Basic Models. |
| Rotary, Variable-speed | 2 Basic Models. |

(3) *AEDM Records Retention Requirements.* If a manufacturer has used an AEDM to determine representative values pursuant to this section, the manufacturer must have available upon request for inspection by the Department records showing:

(i) The AEDM, including the mathematical model, the engineering or statistical analysis, and/or computer simulation or modeling that is the basis of the AEDM;

(ii) Equipment information, complete test data, AEDM calculations, and the statistical comparisons from the units tested that were used to validate the AEDM pursuant to paragraph (h)(2) of this section; and

(iii) Equipment information and AEDM calculations for each basic model to which the AEDM was applied.

(4) *Additional AEDM requirements.* If requested by the Department, the manufacturer must:

(i) Conduct simulations before representatives of the Department to predict the performance of particular basic models of the equipment to which the AEDM was applied;

(ii) Provide analyses of previous simulations conducted by the manufacturer; and/or

(iii) Conduct certification testing of basic models selected by the Department.

(i) *Alternative determination of standby mode and off mode power consumption for untested basic models of consumer furnaces and consumer boilers.* For models of consumer furnaces or consumer boilers that have identical standby mode and off mode power consuming components, ratings for untested basic models may be established in accordance with the following procedures in lieu of testing. This method allows only for the use of ratings identical to those of a tested basic model as provided in paragraphs (i)(1) and (2) of this section; simulations or other modeling predictions for ratings for standby mode power consumption and off mode power consumption are not permitted.

(1) *Consumer furnaces.* Rate the standby mode and off mode power consumption of an untested basic model of a consumer furnace using the standby mode and off mode power consumption obtained from a tested basic model as a basis for ratings if all aspects of the electrical components, controls, and design that impact the standby mode power consumption and off mode power consumption are identical.

(2) *Consumer boilers.* Rate the standby mode and off mode power consumption of an untested basic model of a consumer boiler using the standby mode and off mode power consumption obtained from a tested basic model as a basis for ratings if all aspects of the electrical components, controls, and design that impact the standby mode power consumption and off mode power consumption are identical.

(j) *Alternative efficiency determination method (AEDM) for electric motors subject to requirements in subpart B of part 431 of this subchapter*—(1) *Criteria an AEDM must satisfy.* A manufacturer is not permitted to apply an AEDM to a basic model of electric motor to determine its efficiency pursuant to this section unless:

(i) The AEDM is derived from a mathematical model that estimates the energy efficiency characteristics and losses of the basic model as measured by the applicable DOE test procedure and accurately represents the mechanical and electrical characteristics of that basic model; and

(ii) The AEDM is based on engineering or statistical analysis, computer simulation or modeling, or other analytic evaluation of actual performance data.

(iii) The manufacturer has validated the AEDM in accordance with paragraph (i)(2) of this section with basic models that meet the current Federal energy conservation standards (if any).

(2) *Validation of an AEDM.* Before using an AEDM, the manufacturer must validate the AEDM's accuracy and reliability by comparing the simulated full-load losses to tested average full-load losses as follows.

(i) *Select basic models.* A manufacturer must select at least five basic models compliant with the energy conservation standards at § 431.25 of this subchapter (if any), in accordance with the criteria paragraphs (i)(2)(i)(A) through (D) of this section. In any instance where it is impossible for a manufacturer to select basic models for testing in accordance with all of these criteria, prioritize the criteria in the order in which they are listed. Within the limits imposed by the criteria, select basic models randomly. In addition, a basic model with a sample size of fewer than five units may not be selected to validate an AEDM.

(A) Two of the basic models must be among the five basic models with the highest unit volumes of production by the manufacturer in the prior 5 years;

(B) No two basic models may have the same horsepower rating;

(C) No two basic models may have the same frame number series; and

(D) Each basic model must have the lowest nominal full-load efficiency among the basic models within the same equipment class.

(ii) *Apply the AEDM to the selected basic models.* Using the AEDM, calculate the simulated full-load losses for each of the selected basic models as follows: $hp \times (1/\text{simulated full-load efficiency} - 1)$, where hp is the horsepower of the basic model.

(iii) *Test at least five units of each of the selected basic models in accordance with § 431.16 of this subchapter.* Use the measured full-load losses for each of the tested units to determine the average of the measured full-load losses for each of the selected basic models.

(iv) *Compare.* The simulated full-load losses for each basic model (as determined under paragraph (i)(2)(ii) of this section) must be greater than or equal to 90 percent of the average of the measured full-load losses (as determined under paragraph (i)(2)(iii) of this section) (*i.e.*, 0.90 × average of the measured full-load losses ≤ simulated full-load losses).

(3) *Verification of an AEDM.* (i) Each manufacturer must periodically select basic models representative of those to which it has applied an AEDM. The manufacturer must select a sufficient number of basic models to ensure the AEDM maintains its accuracy and reliability. For each basic model selected for verification:

(A) Subject at least one unit for each basic model to test in accordance with § 431.16 of this subchapter by an accredited laboratory that meets the requirements of § 429.65(f). If one unit per basic model is selected, the simulated full-load losses for each basic model must be greater than or equal to 90 percent of the measured full-load losses (*i.e.*, 0.90 × the measured full-load losses ≤ simulated full-load losses). If more than one unit per basic model is selected, the simulated full-load losses for each basic model must be greater than or equal to 90 percent of the average of the measured full-load losses (*i.e.*, 0.90 × average of the measured full-load losses ≤ simulated full-load losses); or

(B) Have a certification body recognized under § 429.73 certify the results of the AEDM as accurately representing the basic model's average full-load efficiency. The simulated full-load efficiency for each basic model must be greater than or equal to 90 percent of the certified full-load losses (*i.e.*, 0.90 × certified full-load losses ≤ simulated full-load losses).

(ii) Each manufacturer that has used an AEDM under this section must have available for inspection by the Department of Energy records showing:

(A) The method or methods used to develop the AEDM;

(B) The mathematical model, the engineering or statistical analysis, computer simulation or modeling, and other analytic evaluation of performance data on which the AEDM is based;

(C) Complete test data, product information, and related information that the manufacturer has generated or acquired pursuant to paragraphs (i)(2) and (3) of this section; and

(D) The calculations used to determine the simulated full-load efficiency of each basic model to which the AEDM was applied.

(iii) If requested by the Department, the manufacturer must:

(A) Conduct simulations to predict the performance of particular basic models of electric motors specified by the Department;

(B) Provide analyses of previous simulations conducted by the manufacturer; and/or

(C) Conduct testing of basic models selected by the Department.

(k) *Alternative efficiency determination method (AEDM) for dedicated-purpose pool pump motors subject to requirements in subpart Z of part 431 of this subchapter*—(1) *Criteria an AEDM must satisfy.* A manufacturer is not permitted to apply an AEDM to a basic model of dedicated-purpose pool pump motors, to determine its efficiency pursuant to this section unless:

(i) The AEDM is derived from a mathematical model that estimates the energy efficiency characteristics and losses of the basic model as measured by the applicable DOE test procedure and accurately represents the mechanical and electrical characteristics of that basic model;

(ii) The AEDM is based on engineering or statistical analysis, computer simulation or modeling, or other analytic evaluation of actual performance data; and

(iii) The manufacturer has validated the AEDM in accordance with paragraph (i)(2) of this section with basic models that meet the current Federal energy conservation standards (if any).

(2) *Validation of an AEDM.* Before using an AEDM, the manufacturer must validate the AEDM's accuracy and reliability by comparing the simulated full-load losses to tested full-load losses as follows:

(i) *Select basic models.* A manufacturer must select at least five basic models compliant with any relevant energy conservation standards at § 431.485 of this subchapter (if any), in accordance

with the criteria paragraphs (j)(2)(i)(A) through (D) of this section. In any instance where it is impossible for a manufacturer to select basic models for testing in accordance with all of these criteria, prioritize the criteria in the order in which they are listed. Within the limits imposed by the criteria, select basic models randomly. In addition, a basic model with a sample size of fewer than five units may not be selected to validate an AEDM.

(A) Two of the basic models must be among the five basic models with the highest unit volumes of production by the manufacturer in the prior 5 years.

(B) No two basic models may have the same total horsepower rating;

(C) No two basic models may have the same speed configuration; and

(D) Each basic model must have the lowest full-load efficiency among the basic models within the same equipment class.

(ii) *Apply the AEDM* to the selected basic models. Using the AEDM, calculate the simulated full-load losses for each of the selected basic models as follows: THP × (1/simulated full-load efficiency − 1), where THP is the total horsepower of the basic model.

(iii) *Test at least five units of each of the selected basic models in accordance with § 431.483 of this subchapter*. Use the measured full-load losses for each of the tested units to determine the average of the measured full-load losses for each of the selected basic models.

(iv) *Compare*. The simulated full-load losses for each basic model (paragraph (i)(2)(ii) of this section) must be greater than or equal to 90 percent of the average of the measured full-load losses (paragraph (i)(2)(iii) of this section) (*i.e.*, 0.90 × average of the measured full-load losses ≤ simulated full-load losses).

(3) *Verification of an AEDM*. (i) Each manufacturer must periodically select basic models representative of those to which it has applied an AEDM. The manufacturer must select a sufficient number of basic models to ensure the AEDM maintains its accuracy and reliability. For each basic model selected for verification:

(A) Subject at least one unit to testing in accordance with § 431.483 of this subchapter by an accredited laboratory that meets the requirements of § 429.65(d). If one unit per basic model is selected, the simulated full-load losses for each basic model must be greater than or equal to 90 percent of the measured full-load losses (*i.e.*, 0.90 × the measured full-load losses ≤ simulated full-load losses). If more than one unit per basic model is selected, the simulated full-load losses for each basic model must be greater than or equal to 90 percent of the average measured full-load losses (*i.e.*, 0.90 × average of the measured full-load losses ≤ simulated full-load losses); or

(B) Have a certification body recognized under § 429.73 certify the results of the AEDM accurately represent the basic model's full-load efficiency. The simulated full-load efficiency for each basic model must be greater than or equal to 90 percent of the certified full-load losses (*i.e.*, 0.90 × certified full-load losses ≤ simulated full-load losses).

(ii) Each manufacturer that has used an AEDM under this section must have available for inspection by the Department of Energy records showing:

(A) The method or methods used to develop the AEDM;

(B) The mathematical model, the engineering or statistical analysis, computer simulation or modeling, and other analytic evaluation of performance data on which the AEDM is based;

(C) Complete test data, product information, and related information that the manufacturer has generated or acquired pursuant to paragraphs (i)(2) and (3) of this section; and

(D) The calculations used to determine the simulated full-load efficiency of each basic model to which the AEDM was applied.

(iii) If requested by the Department, the manufacturer must:

(A) Conduct simulations to predict the performance of particular basic models of dedicated-purpose pool pump motors specified by the Department;

(B) Provide analyses of previous simulations conducted by the manufacturer;

(C) Conduct testing of basic models selected by the Department; or

(D) A combination of the foregoing.

(l) *Alternate Efficiency Determination Method (AEDM) for air-cooled, three-*

*phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with less than 65,000 Btu/h cooling capacity*—(1) *Applicability.* (i) For air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h subject to standards in terms of seasonal energy efficiency ratio (SEER) and heating seasonal performance factor (HSPF), representations with respect to the energy use or efficiency, including compliance certifications, are subject to the requirements in § 429.70(c) of this title as it appeared in the 10 CFR parts 200–499 edition revised as of January 1, 2021.

(ii) For air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h subject to standards in terms of seasonal energy efficiency ratio 2 (SEER2) and heating seasonal performance factor 2 (HSPF2) metrics, representations with respect to the energy use or efficiency, including compliance certifications, are subject to the requirements in this section. If manufacturers choose to certify compliance with any standards in terms of SEER2 and HSPF2 prior to the applicable compliance date for those standards, the requirements of this section must be followed.

(2) *Criteria an AEDM must satisfy.* A manufacturer may not apply an AEDM to an individual model/combination to determine its represented values (SEER2 and HSPF2, as applicable) pursuant to this section unless authorized pursuant to § 429.67(e) and:

(i) The AEDM is derived from a mathematical model that estimates the energy efficiency or energy consumption characteristics of the individual model or combination (SEER2 and HSPF2, as applicable) as measured by the applicable DOE test procedure; and

(ii) The manufacturer has validated the AEDM in accordance with paragraph (i)(3) of this section.

(3) *Validation of an AEDM.* For manufacturers whose models of air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h or air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h are otherwise identical to their central air conditioner and heat pump models (meaning differing only in phase or voltage of the electrical system and the phase or voltage of power input for which the motors and compressors are designed) and who have validated an AEDM for the otherwise identical central air conditioners and heat pumps under § 429.70(e)(2), no additional validation is required. For manufacturers whose models of air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h or air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h who have not validated an AEDM for otherwise identical central air conditioners and heat pumps under § 429.70(e)(2) must, before using an AEDM, validate the AEDM's accuracy and reliability as follows:

(i) *Minimum testing.* The manufacturer must test a single unit each of two basic models in accordance with paragraph (i)(3)(iii) of this section. Using the AEDM, calculate the energy use or efficiency for each of the tested individual models/combinations within each basic model. Compare the represented value based on testing and the AEDM energy use or efficiency output according to paragraph (i)(3)(ii) of this section. The manufacturer is responsible for ensuring the accuracy and reliability of the AEDM and that their representations are appropriate and the models being distributed in commerce meet the applicable standards, regardless of the amount of testing required in this paragraph.

(ii) *Individual model/combination tolerances.* This paragraph (i)(3)(ii) provides the tolerances applicable to individual models/combinations rated using an AEDM.

(A) The predicted represented values for each individual model/combination calculated by applying the AEDM may not be more than four percent greater (for measures of efficiency) or less (for measures of consumption) than the values determined from the corresponding test of the individual model/combination.

(B) The predicted energy efficiency or consumption for each individual model/combination calculated by applying the AEDM must meet or exceed the applicable federal energy conservation standard.

(iii) *Additional test unit requirements.* (A) Each AEDM must be supported by test data obtained from physical tests of current individual models/combinations; and

(B) Test results used to validate the AEDM must meet or exceed current, applicable Federal standards as specified in part 431 of this chapter; and

(C) Each test must have been performed in accordance with the applicable DOE test procedure with which compliance is required at the time the individual models/combinations used for validation are distributed in commerce.

(4) *AEDM records retention requirements.* If a manufacturer has used an AEDM to determine representative values pursuant to this section, the manufacturer must have available upon request for inspection by the Department records showing:

(i) The AEDM, including the mathematical model, the engineering or statistical analysis, and/or computer simulation or modeling that is the basis of the AEDM;

(ii) Product information, complete test data, AEDM calculations, and the statistical comparisons from the units tested that were used to validate the AEDM pursuant to paragraph (i)(3) of this section; and

(iii) Product information and AEDM calculations for each individual model/combination to which the AEDM has been applied.

(5) *Additional AEDM requirements.* If requested by the Department, the manufacturer must:

(i) Conduct simulations before representatives of the Department to predict the performance of particular individual models/combinations;

(ii) Provide analyses of previous simulations conducted by the manufacturer; and/or

(iii) Conduct certification testing of individual models or combinations selected by the Department.

(6) *AEDM verification testing.* DOE may use the test data for a given individual model/combination generated pursuant to § 429.104 to verify the represented value determined by an AEDM as long as the following process is followed:

(i) *Selection of units.* DOE will obtain one or more units for test from retail, if available. If units cannot be obtained from retail, DOE will request that a unit be provided by the manufacturer;

(ii) *Lab requirements.* DOE will conduct testing at an independent, third-party testing facility of its choosing. In cases where no third-party laboratory is capable of testing the equipment, testing may be conducted at a manufacturer's facility upon DOE's request.

(iii) *Testing.* At no time during verification testing may the lab and the manufacturer communicate without DOE authorization. If, during test set-up or testing, the lab indicates to DOE that it needs additional information regarding a given individual model or combination in order to test in accordance with the applicable DOE test procedure, DOE may organize a meeting between DOE, the manufacturer, and the lab to provide such information.

(iv) *Failure to meet certified value.* If an individual model/combination tests worse than its certified value (*i.e.*, lower than the certified efficiency value or higher than the certified consumption value) by more than 5 percent, or the test results in cooling capacity that is lower than its certified cooling capacity, DOE will notify the manufacturer. DOE will provide the manufacturer with all documentation related to the test set up, test conditions, and test results for the unit.

Within the timeframe allotted by DOE, the manufacturer may present any and all claims regarding testing validity.

(v) *Tolerances.* This paragraph specifies the tolerances DOE will permit when conducting verification testing.

(A) For consumption metrics, the result from a DOE verification test must be less than or equal to 1.05 multiplied by the certified represented value.

(B) For efficiency metrics, the result from a DOE verification test must be greater than or equal to 0.95 multiplied by the certified represented value.

(vi) *Invalid represented value.* If, following discussions with the manufacturer and a retest where applicable, DOE determines that the verification testing was conducted appropriately in accordance with the DOE test procedure, DOE will issue a determination that the represented values for the basic model are invalid. The manufacturer must conduct additional testing and re-rate and re-certify the individual models/combinations within the basic model that were rated using the AEDM based on all test data collected, including DOE's test data.

(vii) *AEDM use.* This paragraph (i)(6)(vii) specifies when a manufacturer's use of an AEDM may be restricted due to prior invalid represented values.

(A) If DOE has determined that a manufacturer made invalid represented values on individual models/combinations within two or more basic models rated using the manufacturer's AEDM within a 24-month period, the manufacturer must test the least efficient and most efficient individual model/combination within each basic model in addition to the individual model/combination specified in § 429.16(b)(2). The 24-month period begins with a DOE determination that a represented value is invalid through the process outlined in paragraphs (i)(6)(i) through (vi) of this section.

(B) If DOE has determined that a manufacturer made invalid represented values on more than four basic models rated using the manufacturer's AEDM within a 24-month period, the manufacturer may no longer use an AEDM.

(C) If a manufacturer has lost the privilege of using an AEDM, the manufacturer may regain the ability to use an AEDM by:

(*1*) Investigating and identifying cause(s) for failures;

(*2*) Taking corrective action to address cause(s);

(*3*) Performing six new tests per basic model, a minimum of two of which must be performed by an independent, third-party laboratory from units obtained from retail to validate the AEDM; and

(*4*) Obtaining DOE authorization to resume use of an AEDM.

(m) *Alternative efficiency determination method (AEDM) for general pumps*—(1) *Criteria an AEDM must satisfy.* A manufacturer may not apply an AEDM to a basic model to determine its efficiency pursuant to this section, unless:

(i) The AEDM is derived from a mathematical model that estimates the energy efficiency or energy consumption characteristics of the basic model as measured by the applicable DOE test procedure;

(ii) The AEDM is based on engineering or statistical analysis, computer simulation or modeling, or other analytic evaluation of performance data; and

(iii) The manufacturer has validated the AEDM, in accordance with paragraph (m)(2) of this section.

(2) *Validation of an AEDM.* Before using an AEDM, the manufacturer must validate the AEDM's accuracy and reliability as follows:

(i) *AEDM overview.* The manufacturer must select at least the minimum number of basic models for each validation class specified in paragraph (m)(2)(iv) of this section to which the particular AEDM applies. Using the AEDM, calculate the PEI for each of the selected basic models. Test each basic model and determine the represented value(s) in accordance with § 429.63(a). Compare the results from the testing and the AEDM output according to paragraph (m)(2)(ii) of this section. The manufacturer is responsible for ensuring the accuracy and repeatability of the AEDM.

(ii) *AEDM basic model tolerances.* (A) The predicted representative PEI for each basic model calculated by applying the AEDM may not be more than five percent less than the represented PEI determined from the corresponding test of the model.

(B) The predicted constant or variable load pump energy index for each basic model calculated by applying the AEDM must meet or exceed the applicable federal energy conservation standard.

(iii) *Additional test unit requirements.* (A) Each AEDM must be supported by test data obtained from physical tests of current models; and

(B) Test results used to validate the AEDM must meet or exceed current, applicable Federal standards as specified in part 431 of this chapter; and

(C) Each test must have been performed in accordance with the applicable DOE test procedure with which compliance is required at the time the basic models used for validation are distributed in commerce.

(iv) *Pump validation classes.*

| Validation class | Minimum number of distinct basic models that must be tested |
|---|---|
| (A) Constant Load End-suction Closed-Coupled Pumps and Constant Load End-suction Frame-Mounted Pumps. | 2 Basic Models. |
| (B) Variable Load End-suction Closed-Coupled Pumps and Variable Load End-suction Frame-Mounted Pumps. | 2 Basic Models. |
| (C) Constant Load Inline Pumps and Constant Load Small Vertical Inline Pumps | 2 Basic Models. |
| (D) Variable Load Inline Pumps and Variable Load Small Vertical Inline Pumps | 2 Basic Models. |
| (E) Constant Load Radially-Split Multi-Stage Vertical Pumps and Constant Load Radially-Split Multi-Stage Horizonal Pumps. | 2 Basic Models. |
| (F) Variable Load Radially-Split Multi-Stage Vertical Pumps and Variable Load Radially-Split Multi-Stage Horizontal Pumps. | 2 Basic Models. |
| (G) Constant Load Submersible Turbine Pumps and Constant Load Vertical Turbine Pumps | 2 Basic Models. |
| (H) Variable Load Submersible Turbine Pumps and Variable Load Vertical Turbine Pumps | 2 Basic Models. |

(3) *AEDM records retention requirements.* If a manufacturer has used an AEDM to determine representative values pursuant to this section, the manufacturer must have available upon request for inspection by the Department records showing:

(i) The AEDM, including the mathematical model, the engineering or statistical analysis, and/or computer simulation or modeling that is the basis of the AEDM;

(ii) Regarding the units tested that were used to validate the AEDM pursuant to paragraph (m)(2) of this section, equipment information, complete test data, AEDM calculations, and the statistical comparisons; and

(iii) For each basic model to which the AEDM was applied, equipment information and AEDM calculations.

(4) *Additional AEDM requirements.* If requested by the Department, the manufacturer must:

(i) Conduct simulations before representatives of the Department to predict the performance of particular basic models of the equipment to which the AEDM was applied;

(ii) Provide analyses of previous simulations conducted by the manufacturer; and/or

(iii) Conduct certification testing of basic models selected by the Department.

(5) *AEDM verification testing.* DOE may use the test data for a given individual model generated pursuant to § 429.104 to verify the certified rating determined by an AEDM as long as the following process is followed:

(i) *Selection of units.* DOE will obtain units for test from retail, where available. If units cannot be obtained from retail, DOE will request that a unit be provided by the manufacturer.

(ii) *Lab requirements.* DOE will conduct testing at an independent, third-party testing facility of its choosing. In cases where no third-party laboratory is capable of testing the equipment, it may be tested at a manufacturer's facility upon DOE's request.

(iii) *Manufacturer participation.* Testing will be performed without manufacturer representatives on-site.

(iv) *Testing.* All verification testing will be conducted in accordance with the applicable DOE test procedure, as well as each of the following to the extent that they apply:

(A) Any active test procedure waivers that have been granted for the basic model;

(B) Any test procedure guidance that has been issued by DOE;

(C) If during test set-up or testing, the lab indicates to DOE that it needs additional information regarding a given basic model in order to test in accordance with the applicable DOE test procedure, DOE may organize a meeting between DOE, the manufacturer and the lab to provide such information.

(D) At no time during the process may the lab communicate directly with the manufacturer without DOE present.

(v) *Failure to meet certified rating.* If a model's test results are worse than its certified rating by an amount exceeding the tolerance prescribed in paragraph (f)(5)(vi) of this section, DOE will notify the manufacturer. DOE will provide the manufacturer with all documentation related to the test set up, test conditions, and test results for the unit. Within the timeframe allotted by DOE, the manufacturer may then present all claims regarding testing validity.

(vi) *Tolerances.* For consumption metrics, the result from a DOE verification test must be less than or equal to the certified rating × (1 + the applicable tolerance).

TABLE 9 TO PARAGRAPH (m)(5)(vi)

| Equipment | Metric | Applicable tolerance (%) |
|---|---|---|
| General Pumps | Constant or Variable Load Pump Energy Index | 5 |

(vii) *Invalid rating.* If, following discussions with the manufacturer and a retest where applicable, DOE determines that the testing was conducted appropriately in accordance with the DOE test procedure, the rating for the model will be considered invalid. The manufacturer must conduct additional testing and re-rate and re-certify the basic models that were rated using the AEDM based on all test data collected, including DOE's test data.

(viii) *AEDM use.* This paragraph (m)(5)(viii) specifies when a manufacturer's use of an AEDM may be restricted due to prior invalid represented values.

(A) If DOE has determined that a manufacturer made invalid ratings on two or more models rated using the same AEDM within a 24-month period, the manufacturer must take the action listed in the table corresponding to the number of invalid certified ratings. The twenty-four month period begins with a DOE determination that a rating is invalid through the process outlined previously. Additional invalid ratings apply for the purposes of determining the appropriate consequences if the subsequent determination(s) is based on selection of a unit for testing within the twenty-four-month period (*i.e.*, subsequent determinations need not be made within 24 months).

TABLE 10 TO PARAGRAPH (m)(5)(viii)(A)

| Number of invalid certified ratings from the same AEDM [1] within a rolling 24-month period [2] | Required manufacturer actions |
|---|---|
| 2 | Submit different test data and reports from testing to validate that AEDM within the validation classes to which it is applied.[3] Adjust the ratings as appropriate. |
| 4 | Conduct double the minimum number of validation tests for the validation classes to which the AEDM is applied. Note, the tests required under this paragraph (m)(5)(viii) must be performed on different models than the original tests required under paragraph (m)(2) of this section. |
| 6 | Conduct the minimum number of validation tests for the validation classes to which the AEDM is applied at a third-party test facility; And<br>Conduct additional testing, which is equal to ½ the minimum number of validation tests for the validation classes to which the AEDM is applied, at either the manufacturer's facility or a third-party test facility, at the manufacturer's discretion. |

TABLE 10 TO PARAGRAPH (m)(5)(viii)(A)—Continued

| Number of invalid certified ratings from the same AEDM[1] within a rolling 24-month period[2] | Required manufacturer actions |
|---|---|
| > = 8 | Note, the tests required under this paragraph (m)(5)(viii) must be performed on different models than the original tests performed under paragraph (m)(2) of this section. Manufacturer has lost privilege to use AEDM. All ratings for models within the validation classes to which the AEDM applied should be rated via testing. Distribution cannot continue until certification(s) are corrected to reflect actual test data. |

[1] The ''same AEDM'' means a computer simulation or mathematical model that is identified by the manufacturer at the time of certification as having been used to rate a model or group of models.

[2] The twenty-four month period begins with a DOE determination that a rating is invalid through the process outlined above. Additional invalid ratings apply for the purposes of determining the appropriate consequences if the subsequent determination(s) is based on testing of a unit that was selected for testing within the twenty-four month period (i.e., subsequent determinations need not be made within 24 months).

[3] A manufacturer may discuss with DOE's Office of Enforcement whether existing test data on different basic models within the validation classes to which that specific AEDM was applied may be used to meet this requirement.

(B) If, as a result of eight or more invalid ratings, a manufacturer has lost the privilege of using an AEDM for rating, the manufacturer may regain the ability to use an AEDM by:

(*1*) Investigating and identifying cause(s) for failures;

(*2*) Taking corrective action to address cause(s);

(*3*) Performing six new tests per validation class, a minimum of two of which must be performed by an independent, third-party laboratory to validate the AEDM; and

(*4*) Obtaining DOE authorization to resume use of the AEDM.

(n) *Alternative efficiency determination method (AEDM) for fans and blowers.* (1) *Criteria an AEDM must satisfy.* A manufacturer is not permitted to apply an AEDM to a basic model of fan or blower to determine represented values pursuant to this section unless:

(i) The AEDM is derived from a mathematical model that estimates the energy use characteristics of the basic model as measured by the applicable DOE test procedure and accurately represents the performance characteristics of that basic model;

(ii) The AEDM is based on engineering or statistical analysis, computer simulation or modeling, or other analytic evaluation of actual performance data; and

(iii) The manufacturer has validated the AEDM in accordance with paragraph (n)(2) of this section.

(2) *Validation of an AEDM.* Before using an AEDM, the manufacturer must validate the AEDM's accuracy and reliability by comparing the simulated FEI, or simulated efficacy, as applicable, to the tested FEI or tested efficacy, as applicable (determined by testing), as follows.

(i) *Select basic models.* For each fan or blower validation class listed as follows: centrifugal housed fan; radial housed fan; centrifugal inline fan; centrifugal unhoused fan; centrifugal power roof ventilator exhaust fan; centrifugal power roof ventilator supply fan; axial inline fan; axial panel fan; axial power roof ventilator; unhoused ACFH; axial housed ACFH; and housed centrifugal air circulating fan to which the AEDM is applied, a manufacturer must select at least two basic models compliant with any energy conservation standards in subpart J of part 431 of this chapter. In addition, at least one basic model selected for validation testing should include a motor, or a motor and controller if the AEDM is applied to a basic model with a motor or to a basic model with a motor and controller.

(ii) *Apply the AEDM* to the selected basic models. Using the AEDM, calculate the simulated FEI, or efficacy, as applicable, for each of the selected basic models.

(iii) *Testing.* Test a sample of units of each of the selected basic models in accordance with 10 CFR 431.174 and determine the FEI or efficacy, as applicable, in accordance with § 429.69(a)(1) and (b)(1) as applicable.

(iv) *Compare.* The simulated FEI or simulated efficacy, as applicable, for each basic model must be less than or equal to 105 percent of the FEI or efficacy, as applicable, determined in

paragraph (n)(2)(iii) of this section through testing.

(v) *Additional AEDM requirements.* When making representations of values other than FEI (*e.g.*, FEP, fan shaft power) or efficacy (as applicable) for a basic model that relies on an AEDM, all other representations are required to be based on the same AEDM results used to generate the represented value of FEI or efficacy.

(3) *Verification of an AEDM*—(i) *Periodic review*s. Each manufacturer must periodically select basic models representative of those to which it has applied an AEDM. The manufacturer must select a sufficient number of basic models to ensure the AEDM maintains its accuracy and reliability. For each basic model selected for verification: subject at least one unit to testing in accordance with 10 CFR 431.174. The provisions in paragraph (n)(2)(iv) of this section must be met.

(ii) *Inspection records.* Each manufacturer that has used an AEDM under this section must have available for inspection by the Department of Energy records showing:

(A) The method or methods used to develop the AEDM;

(B) The mathematical model, the engineering or statistical analysis, computer simulation or modeling, and other analytic evaluation of performance data on which the AEDM is based;

(C) Complete test data, equipment information, and related information that the manufacturer has generated or acquired pursuant to paragraphs (n)(2) and (3) of this section; and

(D) The calculations used to determine the simulated FEI or simulated weighted-average FEI, as applicable, of each basic model to which the AEDM was applied.

(iii) *Simulations.* If requested by the Department, the manufacturer must:

(A) Conduct simulations to predict the performance of particular basic models of electric motors specified by the Department;

(B) Provide analyses of previous simulations conducted by the manufacturer; and/or

(C) Conduct testing of basic models selected by the Department.

[76 FR 12451, Mar. 7, 2011; 76 FR 24780, May 2, 2011, as amended at 78 FR 79595, Dec. 31, 2013; 79 FR 25505, May 5, 2014; 79 FR 27410, May 13, 2014; 80 FR 152, Jan. 5, 2015; 79 FR 40565, July 11, 2014; 81 FR 4145, Jan. 25, 2016; 81 FR 37054, June 8, 2016; 81 FR 89304, Dec. 9, 2016; 82 FR 1100, Jan. 4, 2017; 82 FR 1475, Jan. 5, 2017; 87 FR 43979, July 22, 2022; 87 FR 45195, July 27, 2022; 87 FR 63649, Oct. 19, 2022; 87 FR 63894, Oct. 20, 2022; 87 FR 77321, Dec. 16, 2022; 88 FR 17973, Mar. 24, 2023; 88 FR 21837 Apr. 11, 2023; 88 FR 27388, May 1, 2023; 88 FR 28835, May 4, 2023; 88 FR 40472, June 21, 2023; 88 FR 53375, Aug. 8, 2023; 89 FR 44034, May 20, 2024; 89 FR 82070, Oct. 9, 2024]

### § 429.71 Maintenance of records.

(a) The manufacturer of any covered product or covered equipment shall establish, maintain, and retain the records of certification reports, of the underlying test data for all certification testing, and of any other testing conducted to satisfy the requirements of this part, part 430, and part 431. Any manufacturer who chooses to use an alternative method for determining energy efficiency or energy use in accordance with § 429.70 must retain the records required by that section, any other records of any testing performed to support the use of the alternative method, and any certifications required by that section, on file for review by DOE for two years following the discontinuance of all models or combinations whose ratings were based on the alternative method.

(b) Such records shall be organized and indexed in a fashion that makes them readily accessible for review by DOE upon request.

(c) The records shall be retained by the manufacturer for a period of two years from the date that the manufacturer or third party submitter has notified DOE that the model has been discontinued in commerce.

(d) When considering if a pump is subject to energy conservation standards under part 431 of this chapter, DOE may need to determine if a pump was designed and constructed to the requirements set forth in Military Specifications: MIL–P–17639F, MIL–P–17881D, MIL–P–17840C, MIL–P–18682D, or MIL–P–18472G. In this case, a manufacturer must provide DOE with copies of the

original design and test data that were submitted to appropriate design review agencies, as required by MIL–P–17639F, MIL–P–17881D, MIL–P–17840C, MIL–P–18682D, or MIL–P–18472G. Military specifications and standards are available for review at *http://everyspec.com/MIL-SPECS*.

(e) When considering if a compressor is subject to energy conservation standards under part 431, DOE may need to determine if a compressors was designed and tested to the requirements set forth in the American Petroleum Institute standard 619, ''Rotary-Type Positive-Displacement Compressors for Petroleum, Petrochemical, and Natural Gas Industries'' (API 619). In this case, DOE may request that a manufacturer provide DOE with copies of the original requirements and test data that were submitted to the purchaser of the compressor, in accordance with API 619.

[76 FR 12451, Mar. 7, 2011, as amended at 81 FR 4145, Jan. 25, 2016; 85 FR 1591, Jan. 10, 2020]

### § 429.72 Alternative methods for determining non-energy ratings.

(a) *General.* Where § 429.14 through § 429.562 authorize the use of an alternative method for determining a physical or operating characteristic other than the energy consumption or efficiency, such characteristics must be determined either by testing in accordance with the applicable test procedure and applying the specified sampling plan provisions established in those sections or as described in the appropriate product-specific paragraph below. In all cases, the computer-aided design (CAD) models, measurements, and calculations used to determine the rating for the physical or operating characteristic shall be retained as part of the test records underlying the certification of the basic model in accordance with § 429.71.

(b) *Testing.* [Reserved]

(c) *Residential refrigerators, refrigerator-freezers, and freezers.* The total refrigerated volume of a basic model of refrigerator, refrigerator-freezer, or freezer may be determined by performing a calculation of the volume based upon computer-aided design (CAD) models of the basic model in lieu of physical measurements of a production unit of the basic model. Any value of total refrigerated volume of a basic model reported to DOE in a certification of compliance in accordance with § 429.14(b)(2) must be calculated using the CAD-derived volume(s) and the applicable provisions in the test procedures in 10 CFR part 430 for measuring volume, and must be within two percent, or 0.5 cubic feet (0.2 cubic feet for compact products), whichever is greater, of the volume of a production unit of the basic model measured in accordance with the applicable test procedure in 10 CFR part 430.

(d) *Miscellaneous refrigeration products.* The total refrigerated volume of a miscellaneous refrigeration product basic model may be determined by performing a calculation of the volume based upon computer-aided design (CAD) models of the basic model in lieu of physical measurements of a production unit of the basic model. Any value of total adjusted volume and value of total refrigerated volume of a basic model reported to DOE in a certification of compliance in accordance with § 429.61(b)(2) must be calculated using the CAD-derived volume(s) and the applicable provisions in the test procedures in part 430 of this chapter for measuring volume. The calculated value must be within two percent, or 0.5 cubic feet (0.2 cubic feet for products with total refrigerated volume less than 7.75 cubic feet (220 liters)), whichever is greater, of the volume of a production unit of the basic model measured in accordance with the applicable test procedure in part 430 of this chapter.

(e) *Commercial instantaneous water heaters (other than storage-type instantaneous water heaters) and hot water supply boilers.* The storage volume of a commercial instantaneous water heater (other than storage-type instantaneous water heaters) or a hot water supply boiler basic model may be determined by performing a calculation of the stored water volume based upon design drawings (including computer-aided design (CAD) models) or physical dimensions of the basic model. Any value of storage volume of a basic model reported to DOE in a certification of compliance in accordance

with § 429.44(c)(2)(iv) through (vii) must be calculated using the design drawings or physical dimensions or measured as per the applicable provisions in the test procedures in § 431.106 of this chapter. Calculations to determine storage volume must include all water contained within the water heater from the inlet connection(s) to the outlet connection(s). The storage volume of water contained in the water heater must then be computed in gallons.

(f) *Commercial refrigerators, freezers, and refrigerator-freezers.* The volume of a basic model of a commercial refrigerator, refrigerator-freezer, or freezer may be determined by performing a calculation of the volume based upon computer-aided design (CAD) models of the basic model in lieu of physical measurements of a production unit of the basic model. If volume is determined by performing a calculation of volume based on CAD drawings, any value of volume of the basic model reported to DOE in a certification of compliance in accordance with § 429.42(b)(2)(iii) must be calculated using the CAD-derived volume(s) and the applicable provisions in the test procedures in 10 CFR part 431.64 for measuring volume.

[79 FR 22348, Apr. 21, 2014, as amended at 81 FR 4145, Jan. 25, 2016; 81 FR 46790, July 18, 2016; 81 FR 79320, Nov. 10, 2016; 88 FR 66222, Sept. 26, 2023; 89 FR 82070, Oct. 9, 2024]

### § 429.73 Department of Energy recognition of nationally recognized certification programs for electric motors, including dedicated-purpose pool pump motors.

(a) *Petition.* For a certification program to be classified by the Department of Energy as being nationally recognized in the United States for the purposes of §§ 429.64 and 429.65, the organization operating the program must submit a petition to the Department requesting such classification, in accordance with paragraph (c) of this section and § 429.75. The petition must demonstrate that the program meets the criteria in paragraph (b) of this section.

(b) *Evaluation criteria.* For a certification program to be classified by the Department as nationally recognized, it must meet the following criteria:

(1) It must have satisfactory standards and procedures for conducting and administering a certification system, including periodic follow up activities to assure that basic models of electric motors continue to conform to the efficiency levels for which they were certified, and for granting a certificate of conformity;

(2) For certification of electric motors, including dedicated-purpose pool pump motors, it must be independent (as defined at § 429.2) of electric motor (including dedicated-purpose pool pump motor) manufacturers, importers, distributors, private labelers or vendors for which it is providing certification;

(3) It must be qualified to operate a certification system in a highly competent manner; and

(4) In the case of electric motors subject to requirements in subpart B of part 431 of this subchapter, the certification program must have expertise in the content and application of the test procedures at § 431.16 of this subchapter and must apply the provisions at §§ 429.64 and 429.70(j); or

(5) In the case of dedicated-purpose pool pump motors subject to requirements in subpart Z of part 431 of this subchapter, the certification program must have expertise in the content and application of the test procedures at § 431.484 of this subchapter and must apply the provisions at §§ 429.65 and 429.70(k).

(c) *Petition format.* Each petition requesting classification as a nationally recognized certification program must contain a narrative statement as to why the program meets the criteria listed in paragraph (b) of this section, must be signed on behalf of the organization operating the program by an authorized representative, and must be accompanied by documentation that supports the narrative statement. The following provides additional guidance as to the specific criteria:

(1) *Standards and procedures.* A copy of the standards and procedures for operating a certification system and for granting a certificate of conformity should accompany the petition.

(2) *Independent status.* The petitioning organization must describe how it is independent (as defined at § 429.2)

from electric motor, including dedicated-purpose pool pump motor manufacturers, importers, distributors, private labelers, vendors, and trade associations.

(3) *Qualifications to operate a certification system.* Experience in operating a certification system should be described and substantiated by supporting documents within the petition. Of particular relevance would be documentary evidence that establishes experience in the application of guidelines contained in the ISO/IEC Guide 65, ''General requirements for bodies operating product certification systems'' (referenced for guidance only, *see* § 429.3), ISO/IEC Guide 27, ''Guidelines for corrective action to be taken by a certification body in the event of either misapplication of its mark of conformity to a product, or products which bear the mark of the certification body being found to subject persons or property to risk'' (referenced for guidance only, *see* § 429.3), and ISO/IEC Guide 28, ''General rules for a model third-party certification system for products'' (referenced for guidance only, *see* § 429.3), as well as experience in overseeing compliance with the guidelines contained in the ISO/IEC Guide 25, ''General requirements for the competence of calibration and testing laboratories'' (referenced for guidance only, *see* § 429.3).

(4) *Expertise in test procedures*—(i) *General.* This part of the petition should include items such as, but not limited to, a description of prior projects and qualifications of staff members. Of particular relevance would be documentary evidence that establishes experience in applying guidelines contained in the ISO/IEC Guide 25, ''General Requirements for the Competence of Calibration and Testing Laboratories'' (referenced for guidance only, *see* § 429.3), and with energy efficiency testing of the equipment to be certified.

(ii) *Electric motors subject to requirements in subpart B of part 431 of this subchapter.* The petition should set forth the program's experience with the test procedures detailed in § 431.16 of this subchapter and the provisions in §§ 429.64 and 429.70(j).

(iii) *Dedicated-purpose pool pump motors subject to requirements in subpart Z of part 431 of this subchapter.* The petition should set forth the program's experience with the test procedures detailed in § 431.484 of this subchapter and the provisions in §§ 429.65 and 429.70(k).

(d) *Disposition.* The Department will evaluate the petition in accordance with § 429.75, and will determine whether the applicant meets the criteria in paragraph (b) of this section for classification as a nationally recognized certification program.

(e) *Periodic evaluation.* Within one year after publication of any final rule regarding electric motors, a nationally recognized certification program must evaluate whether they meet the criteria in paragraph (b) of this section and must either submit a letter to DOE certifying that no change to its program is needed to continue to meet the criteria in paragraph (b) or submit a letter describing the measures implemented to ensure the criteria in paragraph (b) are met. A certification program will continue to be classified by the Department of Energy as being nationally recognized in the United States until DOE concludes otherwise.

[87 FR 63651, Oct. 19, 2022]

### § 429.74 Department of Energy recognition of accreditation bodies for electric motors, including dedicated-purpose pool pump motors.

(a) *Petition.* To be classified by the Department of Energy as an accreditation body, an organization must submit a petition to the Department requesting such classification, in accordance with paragraph (c) of this section and § 429.75. The petition must demonstrate that the organization meets the criteria in paragraph (b) of this section.

(b) *Evaluation criteria.* To be classified as an accreditation body by the Department, the organization must meet the following criteria:

(1) It must have satisfactory standards and procedures for conducting and administering an accreditation system and for granting accreditation. This must include provisions for periodic audits to verify that the laboratories receiving its accreditation continue to conform to the criteria by which they

were initially accredited, and for withdrawal of accreditation where such conformance does not occur, including failure to provide accurate test results.

(2) It must be independent (as defined at § 429.2) of electric motor manufacturers, importers, distributors, private labelers or vendors for which it is providing accreditation.

(3) It must be qualified to perform the accrediting function in a highly competent manner.

(4)(i) In the case of electric motors subject to requirements in subpart B of part 431 of this subchapter, the organization must be an expert in the content and application of the test procedures and methodologies at § 431.16 of this subchapter and § 429.64.

(ii) In the case of dedicated-purpose pool pump motors subject to requirements in subpart Z of part 431 of this subchapter, the organization must be an expert in the content and application of the test procedures and methodologies at § 431.484 of this subchapter and § 429.65.

(c) *Petition format.* Each petition requesting classification as an accreditation body must contain a narrative statement as to why the program meets the criteria set forth in paragraph (b) of this section, must be signed on behalf of the organization operating the program by an authorized representative, and must be accompanied by documentation that supports the narrative statement. The following provides additional guidance:

(1) *Standards and procedures.* A copy of the organization's standards and procedures for operating an accreditation system and for granting accreditation should accompany the petition.

(2) *Independent status.* The petitioning organization must describe how it is independent (as defined at § 429.2) from electric motor manufacturers, importers, distributors, private labelers, vendors, and trade associations.

(3) *Qualifications to do accrediting.* Experience in accrediting should be discussed and substantiated by supporting documents. Of particular relevance would be documentary evidence that establishes experience in the application of guidelines contained in the ISO/IEC Guide 58, ''Calibration and testing laboratory accreditation systems—General requirements for operation and recognition'' (referenced for guidance only, *see* § 429.3), as well as experience in overseeing compliance with the guidelines contained in the ISO/IEC Guide 25, ''General Requirements for the Competence of Calibration and Testing Laboratories'' (referenced for guidance only, *see* § 429.3).

(4) *Expertise in test procedures.* The petition should set forth the organization's experience with the test procedures and methodologies test procedures and methodologies at § 431.16 of this subchapter and § 429.64. This part of the petition should include items such as, but not limited to, a description of prior projects and qualifications of staff members. Of particular relevance would be documentary evidence that establishes experience in applying the guidelines contained in the ISO/IEC Guide 25, ''General Requirements for the Competence of Calibration and Testing Laboratories,'' (referenced for guidance only, *see* § 429.3) to energy efficiency testing for electric motors.

(d) *Disposition.* The Department will evaluate the petition in accordance with § 429.75, and will determine whether the applicant meets the criteria in paragraph (b) of this section for classification as an accrediting body.

[87 FR 63652, Oct. 19, 2022]

### § 429.75 Procedures for recognition and withdrawal of recognition of accreditation bodies or certification programs.

(a) *Filing of petition.* Any petition submitted to the Department pursuant to § 429.73(a) or § 429.74(a), shall be entitled ''Petition for Recognition'' (''Petition'') and must be submitted to the Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office, Appliance and Equipment Standards Program, EE–5B, 1000 Independence Avenue SW, Washington, DC 20585–0121, or via email (preferred submittal method) to *AS_Motor_Petitions@ee.doe.gov*. In accordance with the provisions set forth in 10 CFR 1004.11, any request for confidential treatment of any information contained in such a Petition or in supporting documentation must be accompanied by a copy of the Petition or supporting documentation from which

the information claimed to be confidential has been deleted.

(b) *Public notice and solicitation of comments.* DOE shall publish in the FEDERAL REGISTER the Petition from which confidential information, as determined by DOE, has been deleted in accordance with 10 CFR 1004.11 and shall solicit comments, data and information on whether the Petition should be granted. The Department shall also make available for inspection and copying the Petition's supporting documentation from which confidential information, as determined by DOE, has been deleted in accordance with 10 CFR 1004.11. Any person submitting written comments to DOE with respect to a Petition shall also send a copy of such comments to the petitioner.

(c) *Responsive statement by the petitioner.* A petitioner may, within 10 working days of receipt of a copy of any comments submitted in accordance with paragraph (b) of this section, respond to such comments in a written statement submitted to the Assistant Secretary for Energy Efficiency and Renewable Energy. A petitioner may address more than one set of comments in a single responsive statement.

(d) *Public announcement of interim determination and solicitation of comments.* The Assistant Secretary for Energy Efficiency and Renewable Energy shall issue an interim determination on the Petition as soon as is practicable following receipt and review of the Petition and other applicable documents, including, but not limited to, comments and responses to comments. The petitioner shall be notified in writing of the interim determination. DOE shall also publish in the FEDERAL REGISTER the interim determination and shall solicit comments, data, and information with respect to that interim determination. Written comments and responsive statements may be submitted as provided in paragraphs (b) and (c) of this section.

(e) *Public announcement of final determination.* The Assistant Secretary for Energy Efficiency and Renewable Energy shall as soon as practicable, following receipt and review of comments and responsive statements on the interim determination, publish in the FEDERAL REGISTER notification of final determination on the Petition.

(f) *Additional information.* The Department may, at any time during the recognition process, request additional relevant information or conduct an investigation concerning the Petition. The Department's determination on a Petition may be based solely on the Petition and supporting documents, or may also be based on such additional information as the Department deems appropriate.

(g) *Withdrawal of recognition*—(1) *Withdrawal by the Department.* If DOE believes that an accreditation body or certification program that has been recognized under § 429.73 or § 429.74, respectively, is failing to meet the criteria of paragraph (b) of the section under which it is recognized, or if the certification program fails to meet the provisions at § 429.73(e), the Department will issue a Notice of Withdrawal (''Notice'') to inform such entity and request that it take appropriate corrective action(s) specified in the Notice. The Department will give the entity an opportunity to respond. In no case shall the time allowed for corrective action exceed 180 days from the date of the notice (inclusive of the 30 days allowed for disputing the bases for DOE's notification of withdrawal). If the entity wishes to dispute any bases identified in the Notice, the entity must respond to DOE within 30 days of receipt of the Notice. If after receiving such response, or no response, the Department believes satisfactory correction has not been made, the Department will withdraw its recognition from that entity.

(2) *Voluntary withdrawal.* An accreditation body or certification program may withdraw itself from recognition by the Department by advising the Department in writing of such withdrawal. It must also advise those that use it (for an accreditation body, the testing laboratories, and for a certification organization, the manufacturers) of such withdrawal.

(3) *Notice of withdrawal of recognition.* The Department will publish in the FEDERAL REGISTER notification of any withdrawal of recognition that occurs pursuant to this paragraph.

[87 FR 63652, Oct. 19, 2022]

**§ 429.76 Portable electric spas.**

(a) *Determination of represented values.* Manufacturers must determine the represented values for each basic model of portable electric spas by testing in conjunction with the following provisions.

(1) For spa covers:

(i) If a basic model is distributed in commerce with multiple covers designated by the spa manufacturer for use with the basic model, a manufacturer must determine all represented values for that basic model based on the cover that results in the highest standby loss, except that the manufacturer may choose to identify specific individual combinations of spa and cover as additional basic models.

(ii) If a basic model is distributed in commerce with no cover designated by the spa manufacturer for use with the basic model, a manufacturer must determine all represented values for that basic model by testing as specified in section 3.1.5.2 of appendix GG to subpart B of this part.

(2) The sampling requirements of § 429.11 are applicable to portable electric spas; and

(3) For each basic model of portable electric spas, a sample of sufficient size must be randomly selected and tested to ensure that any representation of standby loss or other measure of energy consumption of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(i) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

and $\bar{x}$ is the sample mean, n is the number of samples, and $x_i$ is the $i^{th}$ sample; or,

(ii) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

and $\bar{x}$ is the sample mean, s is the sample standard deviation, n is the number of samples, and $t_{0.95}$ is the t statistic for a 95 percent one-tailed confidence interval with n-1 degrees of freedom (from appendix A of subpart B of part 429).

(4) The represented value of standby loss must be a whole number of watts.

(5) The represented value of fill volume of a basic model must be a whole number of gallons that is within 5 gallons of the mean of the fill volumes measured for the units in the sample selected as described in paragraph (a)(3) of this section.

(b) [Reserved]

[88 FR 38627, June 13, 2023]

APPENDIX A TO SUBPART B OF PART 429—STUDENT'S T-DISTRIBUTION VALUES FOR CERTIFICATION TESTING

FIGURE 1—T-DISTRIBUTION VALUES FOR CERTIFICATION TESTING

[One-Sided]

| Degrees of freedom (from Appendix A) | Confidence Interval | | | |
|---|---|---|---|---|
| | 90% | 95% | 97.5% | 99% |
| 1 | 3.078 | 6.314 | 12.71 | 31.82 |
| 2 | 1.886 | 2.920 | 4.303 | 6.965 |
| 3 | 1.638 | 2.353 | 3.182 | 4.541 |
| 4 | 1.533 | 2.132 | 2.776 | 3.747 |
| 5 | 1.476 | 2.015 | 2.571 | 3.365 |
| 6 | 1.440 | 1.943 | 2.447 | 3.143 |
| 7 | 1.415 | 1.895 | 2.365 | 2.998 |
| 8 | 1.397 | 1.860 | 2.306 | 2.896 |
| 9 | 1.383 | 1.833 | 2.262 | 2.821 |
| 10 | 1.372 | 1.812 | 2.228 | 2.764 |

FIGURE 1—T-DISTRIBUTION VALUES FOR CERTIFICATION TESTING—Continued

[One-Sided]

| Degrees of freedom (from Appendix A) | Confidence Interval | | | |
|---|---|---|---|---|
| | 90% | 95% | 97.5% | 99% |
| 11 | 1.363 | 1.796 | 2.201 | 2.718 |
| 12 | 1.356 | 1.782 | 2.179 | 2.681 |
| 13 | 1.350 | 1.771 | 2.160 | 2.650 |
| 14 | 1.345 | 1.761 | 2.145 | 2.624 |
| 15 | 1.341 | 1.753 | 2.131 | 2.602 |
| 16 | 1.337 | 1.746 | 2.120 | 2.583 |
| 17 | 1.333 | 1.740 | 2.110 | 2.567 |
| 18 | 1.330 | 1.734 | 2.101 | 2.552 |
| 19 | 1.328 | 1.729 | 2.093 | 2.539 |
| 20 | 1.325 | 1.725 | 2.086 | 2.528 |

[76 FR 12451, Mar. 7, 2011; 76 FR 24780, May 2, 2011]

APPENDIX B TO SUBPART B OF PART 429—NOMINAL FULL-LOAD EFFICIENCY TABLE FOR ELECTRIC MOTORS

| | | | | |
|---|---|---|---|---|
| 99.0 | 96.5 | 88.5 | 68 | 36.5 |
| 98.9 | 96.2 | 87.5 | 66 | 34.5 |
| 98.8 | 95.8 | 86.5 | 64 | |
| 98.7 | 95.4 | 85.5 | 62 | |
| 98.6 | 95 | 84 | 59.5 | |
| 98.5 | 94.5 | 82.5 | 57.5 | |
| 98.4 | 94.1 | 81.5 | 55 | |
| 98.2 | 93.6 | 80 | 52.5 | |
| 98 | 93 | 78.5 | 50.5 | |
| 97.8 | 92.4 | 77 | 48 | |
| 97.6 | 91.7 | 75.5 | 46 | |
| 97.4 | 91 | 74 | 43.5 | |
| 97.1 | 90.2 | 72 | 41 | |
| 96.8 | 89.5 | 70 | 38.5 | |

[87 FR 63653, Oct. 19, 2022]

## Subpart C—Enforcement

### § 429.100 Purpose and scope.

This subpart describes the enforcement authority of DOE to ensure compliance with the conservation standards and regulations.

### § 429.102 Prohibited acts subjecting persons to enforcement action.

(a) Each of the following actions is prohibited:

(1) Failure of a manufacturer to provide, maintain, permit access to, or copying of records required to be supplied under the Act and this part or failure to make reports or provide other information required to be supplied under the Act and this part, including but not limited to failure to properly certify covered products and covered equipment in accordance with § 429.12 and §§ 429.14 through 429.66;

(2) Failure to test any covered product or covered equipment subject to an applicable energy conservation standard in conformance with the applicable test requirements prescribed in 10 CFR parts 430 or 431;

(3) Deliberate use of controls or features in a covered product or covered equipment to circumvent the requirements of a test procedure and produce test results that are unrepresentative of a product's energy or water consumption if measured pursuant to DOE's required test procedure;

(4) Failure of a manufacturer to supply at the manufacturer's expense a requested number of covered products or covered equipment to a designated test laboratory in accordance with a test notice issued by DOE;

(5) Failure of a manufacturer to permit a DOE representative to observe any testing required by the Act and this part and inspect the results of such testing;

(6) Distribution in commerce by a manufacturer or private labeler of any new covered product or covered equipment that is not in compliance with an applicable energy conservation standard prescribed under the Act;

(7) Distribution in commerce by a manufacturer or private labeler of a basic model of covered product or covered equipment after a notice of noncompliance determination has been issued to the manufacturer or private labeler;

(8) Knowing misrepresentation by a manufacturer or private labeler by certifying an energy use or efficiency rating of any covered product or covered equipment distributed in commerce in a manner that is not supported by test data;

(9) For any manufacturer, distributor, retailer, or private labeler to distribute in commerce an adapter that—

(i) Is designed to allow an incandescent lamp that does not have a medium screw base to be installed into a fixture or lamp holder with a medium screw base socket; and

(ii) Is capable of being operated at a voltage range at least partially within 110 and 130 volts; or

(10) For any manufacturer or private labeler to knowingly sell a product to a distributor, contractor, or dealer with knowledge that the entity routinely violates any regional standard applicable to the product.

(b) When DOE has reason to believe that a manufacturer or private labeler has undertaken a prohibited act listed in paragraph (a) of this section, DOE may:

(1) Issue a notice of noncompliance determination;

(2) Impose additional certification testing requirements;

(3) Seek injunctive relief;

(4) Assess a civil penalty for knowing violations; or

(5) Undertake any combination of the above.

(c) *Violations of regional standards.* (1) It is a violation for a distributor to knowingly sell a product to a contractor or dealer with knowledge that the entity will sell and/or install the product in violation of any regional standard applicable to the product.

(2) It is a violation for a distributor to knowingly sell a product to a contractor or dealer with knowledge that the entity routinely violates any regional standard applicable to the product.

(3) It is a violation for a contractor or dealer to knowingly sell to and/or install for an end user a central air conditioner subject to regional standards with the knowledge that such product will be installed in violation of any regional standard applicable to the product.

(4) A ''product installed in violation'' includes:

(i) A complete central air conditioning system that is not certified as a complete system that meets the applicable standard. Combinations that were previously validly certified may be installed after the manufacturer has discontinued the combination, provided all combinations within the basic model, including for single-split-system AC with single-stage or two-stage compressor at least one coil-only combination as specified in paragraph (a)(1) of this section, comply with the regional standard applicable at the time of installation.

(ii) An outdoor unit with no match (*i.e.*, that is not offered for sale with an indoor unit) that is not certified as part of a combination that meets the applicable standard.

(iii) An outdoor unit that is part of a certified combination rated less than the standard applicable in the region in which it is installed or, where applicable, an outdoor unit with no certified coil-only combination as specified in paragraph (a)(1) of this section that meets the standard applicable in the region in which it is installed.

[76 FR 12451, Mar. 7, 2011, as amended at 81 FR 4145, Jan. 25, 2016; 81 FR 45402, July 14, 2016; 87 FR 53639, Aug. 31, 2022; 87 FR 64586, Oct. 25, 2022]

### § 429.104 Assessment testing.

(a) DOE may, at any time, test a basic model to assess whether the basic

model is in compliance with the applicable energy conservation standard(s).

(b) For variable refrigerant flow multi-split air conditioners and heat pumps (other than air-cooled with rated cooling capacity less than 65,000 btu/h), when DOE may require that the manufacturer of a basic model ship at its expense any means of control for the basic model necessary for conducting testing in accordance with Appendix D1 to subpart F of 10 CFR part 431 of this subchapter.

[87 FR 63895, Oct. 20, 2022]

### § 429.106 Investigation of compliance.

(a) DOE may initiate an investigation that a basic model may not be compliant with an applicable conservation standard, certification requirement or other regulation at any time.

(b) DOE may, at any time, request any information relevant to determining compliance with any requirement under parts 429, 430 and 431, including the data underlying certification of a basic model. Such data may be used by DOE to make a determination of compliance or noncompliance with an applicable standard.

### § 429.110 Enforcement testing.

(a) *General provisions.* (1) If DOE has reason to believe that a basic model is not in compliance it may test for enforcement.

(2) For variable refrigerant flow multi-split air conditioners and heat pumps (other than air-cooled with rated cooling capacity less than 65,000 Btu/h), when determining compliance with an energy conservation standard based on IEER, DOE may test for enforcement if DOE has reason to believe that a basic model is not in compliance, has invalid certified operational settings for critical parameter values, or has an otherwise invalid certified rating.

(3) DOE will select and test units pursuant to paragraphs (c) and (e) of this section.

(4) Testing will be conducted at a laboratory accredited to the International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC), ''General requirements for the competence of testing and calibration laboratories,'' ISO/IEC 17025:2005(E) (incorporated by reference; see § 429.4). If testing cannot be completed at an independent laboratory, DOE, at its discretion, may allow enforcement testing at a manufacturer's laboratory, so long as the lab is accredited to ISO/IEC 17025:2005(E) and DOE representatives witness the testing. In addition, for commercial packaged boilers with rated input greater than 5,000,000 Btu/h, DOE, at its discretion, may allow enforcement testing of a commissioned commercial packaged boiler in the location in which it was commissioned for use, pursuant to the test provisions at § 431.86(c) of this chapter, for which accreditation to ISO/IEC 17025:2005(E) would not be required.

(b) *Test notice.* (1) To obtain units for enforcement testing to determine compliance with an applicable standard, DOE will issue a test notice addressed to the manufacturer in accordance with the following requirements:

(i) DOE will send the test notice to the manufacturer's certifying official or other company official.

(ii) The test notice will specify the basic model that will be selected for testing, the method of selecting the test sample, the maximum size of the sample and the size of the initial test sample, the dates at which testing is scheduled to be started and completed, and the facility at which testing will be conducted. The test notice may also provide for situations in which the selected basic model is unavailable for testing and may include alternative models or basic models.

(iii) DOE will state in the test notice that it will select the units of a basic model to be tested from the manufacturer, from one or more distributors, and/or from one or more retailers. If any unit is selected from a distributor or retailer, the manufacturer shall make arrangements with the distributor or retailer for compensation for or replacement of any such units.

(iv) DOE may require in the test notice that the manufacturer of a basic model ship or cause to be shipped from a retailer or distributor at its expense the requested number of units of a basic model specified in such test notice to the testing laboratory specified in the test notice. The manufacturer

shall ship the specified initial test unit(s) of the basic model to the testing laboratory within 5 working days from the time unit(s) are selected. For variable refrigerant flow multi-split air conditioners and heat pumps (other than air-cooled with rated cooling capacity less than 65,000 btu/h) the manufacturer shall also ship any means of control necessary for conducting testing in accordance with appendix D1 to subpart F of 10 CFR part 431 of this subchapter. The manufacturer may ship the means of control separately from the system(s) selected for testing.

(v) If DOE determines that the units identified are low-volume or built-to-order products, DOE will contact the manufacturer to develop a plan for enforcement testing in lieu of paragraphs (ii)–(iv) of this section.

(2) [Reserved]

(c) *Test unit selection.* (1) To select units for testing from a:

(i) Manufacturer's warehouse, distributor, or other facility affiliated with the manufacturer. DOE will select a batch sample at random in accordance with the provisions in paragraph (e) of this section and the conditions specified in the test notice. DOE will randomly select an initial test sample of units from the batch sample for testing in accordance with appendices A through C of this subpart. DOE will make a determination whether an alternative sample size will be used in accordance with the provisions in paragraph (e)(1)(iv) of this section.

(ii) Retailer or other facility not affiliated with the manufacturer. DOE will select an initial test sample of units at random that satisfies the minimum units necessary for testing in accordance with the provisions in appendices A through C of this subpart and the conditions specified in the test notice. Depending on the results of the testing, DOE may select additional units for testing from a retailer in accordance with appendices A through C of this subpart. If the full sample is not available from a retailer, DOE will make a determination whether an alternative sample size will be used in accordance with the provisions in paragraph (e)(1)(iv) of this section.

(iii) Previously commissioned commercial packaged boilers with a rated input greater than 5,000,000 Btu/h. DOE may test a sample of at least one unit in the location in which it was commissioned for use.

(2) Units tested in accordance with the applicable test procedure under this part by DOE or another Federal agency, pursuant to other provisions or programs, may count toward units in the test sample.

(3) The resulting test data shall constitute official test data for the basic model. Such test data will be used by DOE to make a determination of compliance or noncompliance if a sufficient number of tests have been conducted to satisfy the requirements of paragraph (e) of this section and appendices A through C of this subpart.

(d) *Test unit preparation.* (1) Prior to and during testing, a test unit selected for enforcement testing shall not be prepared, modified, or adjusted in any manner unless such preparation, modification, or adjustment is allowed by the applicable DOE test procedure. One test shall be conducted for each test unit in accordance with the applicable test procedures prescribed in parts 430 and 431.

(2) No quality control, testing or assembly procedures shall be performed on a test unit, or any parts and subassemblies thereof, that is not performed during the production and assembly of all other units included in the basic model.

(3) A test unit shall be considered defective if such unit is inoperative or is found to be in noncompliance due to failure of the unit to operate according to the manufacturer's design and operating instructions. Defective units, including those damaged due to shipping or handling, shall be reported immediately to DOE. DOE may authorize testing of an additional unit on a case-by-case basis.

(e) *Basic model compliance.* DOE will evaluate whether a basic model complies with the applicable energy conservation standard(s) based on testing conducted in accordance with the applicable test procedures specified in parts 430 and 431 of this chapter, and with the following statistical sampling procedures:

(1) For products with applicable energy conservation standard(s) in § 430.32

of this chapter, and commercial prerinse spray valves, illuminated exit signs, traffic signal modules and pedestrian modules, commercial clothes washers, dedicated-purpose pool pumps, circulator pumps, and metal halide lamp ballasts, DOE will use a sample size of not more than 21 units and follow the sampling plans in appendix A of this subpart (Sampling for Enforcement Testing of Covered Consumer Products and Certain High-Volume Commercial Equipment).

(2) For automatic commercial ice makers; commercial refrigerators, freezers, and refrigerator-freezers; refrigerated bottled or canned vending machines; commercial air conditioners and heat pumps; commercial packaged boilers; commercial warm air furnaces; commercial water heating equipment; and walk-in cooler and walk-in freezer doors, panels, and refrigeration systems, DOE will use an initial sample size of not more than four units and follow the sampling plans in appendix B to this subpart.

(3) If fewer than four units of a basic model are available for testing (under paragraphs (e)(1) or (2) of this section) when the manufacturer receives the notice, then:

(i) DOE will test the available unit(s); or

(ii) If one or more other units of the basic model are expected to become available within 30 calendar days, DOE may instead, at its discretion, test either:

(A) The available unit(s) and one or more of the other units that subsequently become available (up to a maximum of four); or

(B) Up to four of the other units that subsequently become available.

(4) For distribution transformers, DOE will use an initial sample size of not more than five units and follow the sampling plans in appendix C of this subpart (Sampling Plan for Enforcement Testing of Distribution Transformers). If fewer than five units of a basic model are available for testing when the manufacturer receives the test notice, then:

(i) DOE will test the available unit(s); or

(ii) If one or more other units of the basic model are expected to become available within 30 calendar days, DOE may instead, at its discretion, test either:

(A) The available unit(s) and one or more of the other units that subsequently become available (up to a maximum of five); or

(B) Up to five of the other units that subsequently become available.

(5) For pumps subject to the test procedures specified in § 431.464(a) of this chapter, DOE will use an initial sample size of not more than four units and will determine compliance based on the arithmetic mean of the sample.

(6) For uninterruptible power supplies, if a basic model is certified for compliance to the applicable energy conservation standard(s) in § 430.32 of this chapter according to the sampling plan in § 429.39(a)(2)(iv)(A) of this chapter, DOE will use a sample size of not more than 21 units and follow the sampling plan in appendix A of this subpart (Sampling for Enforcement Testing of Covered Consumer Products and Certain High-Volume Commercial Equipment). If a basic model is certified for compliance to the applicable energy conservation standard(s) in § 430.32 of this chapter according to the sampling plan in § 429.39(a)(2)(iv)(B) of this chapter, DOE will use a sample size of at least one unit and follow the sampling plan in appendix D of this subpart (Sampling for Enforcement Testing of Uninterruptible Power Supplies).

(7) Notwithstanding paragraphs (e)(1) through (6) of this section, if testing of the available or subsequently available units of a basic model would be impractical, as for example when a basic model has unusual testing requirements or has limited production, DOE may in its discretion decide to base the determination of compliance on the testing of fewer than the otherwise required number of units.

(8) When DOE makes a determination in accordance with paragraph (e)(7) of this section to test less than the number of units specified in paragraphs (e)(1) through (6) of this section, DOE will base the compliance determination on the results of such testing in accordance with appendix B of this subpart (Sampling Plan for Enforcement Testing of Covered Equipment and Certain Low-Volume Covered Products)

using a sample size ($n_1$) equal to the number of units tested.

(9) For the purposes of this section, available units are those that are available for distribution in commerce within the United States.

[76 FR 12451, Mar. 7, 2011, as amended at 81 FR 4145, Jan. 25, 2016; 81 FR 31841, May 20, 2016; 81 FR 89304, Dec. 9, 2016; 81 FR 89822, Dec. 12, 2016; 81 FR 95800, Dec. 28, 2016; 82 FR 36918, Aug. 7, 2017; 87 FR 57298, Sept. 19, 2022; 87 FR 63895, Oct. 20, 2022; 88 FR 28837, May 4, 2023]

### § 429.114 Notice of noncompliance and notice to cease distribution of a basic model.

(a) In the event that DOE determines a basic model is noncompliant with an applicable energy conservation standard, or if a manufacturer or private labeler determines a basic model to be in noncompliance, DOE may issue a notice of noncompliance determination to the manufacturer or private labeler. This notice of noncompliance determination will notify the manufacturer or private labeler of its obligation to:

(1) Immediately cease distribution in commerce of the basic model;

(2) Give immediate written notification of the determination of noncompliance to all persons to whom the manufacturer has distributed units of the basic model manufactured since the date of the last determination of compliance; and

(3) Provide DOE, within 30 calendar days of the request, records, reports and other documentation pertaining to the acquisition, ordering, storage, shipment, or sale of a basic model determined to be in noncompliance.

(b) In the event that DOE determines a manufacturer has failed to comply with an applicable certification requirement with respect to a particular basic model, DOE may issue a notice of noncompliance determination to the manufacturer or private labeler. This notice of noncompliance determination will notify the manufacturer or private labeler of its obligation to:

(1) Immediately cease distribution in commerce of the basic model;

(2) Immediately comply with the applicable certification requirement; and/or

(3) Provide DOE within 30 days of the request, records, reports and other documentation pertaining to the acquisition, ordering, storage, shipment, or sale of the basic model.

(c) If a manufacturer or private labeler fails to comply with the required actions in the notice of noncompliance determination as set forth in paragraphs (a) or (b) of this section, the General Counsel (or delegee) may seek, among other remedies, injunctive action and civil penalties, where appropriate.

(d) The manufacturer may modify a basic model determined to be noncompliant with an applicable energy conservation standard in such manner as to make it comply with the applicable standard. Such modified basic model shall then be treated as a new basic model and must be certified in accordance with the provisions of this part; except that in addition to satisfying all requirements of this part, any models within the basic model must be assigned new model numbers and the manufacturer shall also maintain, and provide upon request to DOE, records that demonstrate that modifications have been made to all units of the new basic model prior to distribution in commerce.

### § 429.116 Additional certification testing requirements.

Pursuant to § 429.102(b)(2), if DOE determines that independent, third-party testing is necessary to ensure a manufacturer's compliance with the rules of this part, part 430, or part 431, a manufacturer must base its certification of a basic model under subpart B of this part on independent, third-party laboratory testing.

### § 429.118 Injunctions.

If DOE has reason to seek an injunction under the Act:

(a) DOE will notify the manufacturer, private labeler or any other person as required, of the prohibited act at issue and DOE's intent to seek a judicial order enjoining the prohibited act unless the manufacturer, private labeler or other person, delivers to DOE within 15 calendar days a corrective action and compliance plan, satisfactory to DOE, of the steps it will take to ensure that the prohibited act ceases.

DOE will monitor the implementation of such plan.

(b) If the manufacturer, private labeler or any other person as required, fails to cease engaging in the prohibited act or fails to provide a satisfactory corrective action and compliance plan, DOE may seek an injunction.

### § 429.120 Maximum civil penalty.

Any person who knowingly violates any provision of § 429.102(a) may be subject to assessment of a civil penalty of no more than $575 for each violation. As to § 429.102(a)(1) with respect to failure to certify, and as to § 429.102(a)(2), (5) through (9), each unit of a covered product or covered equipment distributed in violation of such paragraph shall constitute a separate violation. For violations of § 429.102(a)(1), (3), and (4), each day of noncompliance shall constitute a separate violation for each basic model at issue.

[76 FR 12451, Mar. 7, 2011, as amended at 81 FR 41794, June 28, 2016; 81 FR 96351, Dec. 30, 2016; 83 FR 1291, Jan. 11, 2018; 83 FR 66083, Dec. 26, 2018; 85 FR 830, Jan. 8, 2020; 86 FR 2955, Jan. 14, 2021; 87 FR 1063, Jan. 10, 2022; 88 FR 2193, Jan. 13, 2023; 89 FR 1028, Jan. 9, 2024; 89 FR 105406, Dec. 27, 2024]

### § 429.122 Notice of proposed civil penalty.

(a) The General Counsel (or delegee) shall provide notice of any proposed civil penalty.

(b) The notice of proposed penalty shall:

(1) Include the amount of the proposed penalty;

(2) Include a statement of the material facts constituting the alleged violation; and

(3) Inform the person of the opportunity to elect in writing within 30 calendar days of receipt of the notice to have the procedures of § 429.128 (in lieu of those of § 429.126) apply with respect to the penalty.

### § 429.124 Election of procedures.

(a) In responding to a notice of proposed civil penalty, the respondent may request:

(1) An administrative hearing before an Administrative Law Judge (ALJ) under § 429.126 of this part; or

(2) Elect to have the procedures of § 429.128 apply.

(b) Any election to have the procedures of § 429.128 apply may not be revoked except with the consent of the General Counsel (or delegee).

(c) If the respondent fails to respond to a notice issued under § 429.120 or otherwise fails to indicate its election of procedures, DOE shall refer the civil penalty action to an ALJ for a hearing under § 429.126.

### § 429.126 Administrative law judge hearing and appeal.

(a) When elected pursuant to § 429.124, DOE shall refer a civil penalty action brought under § 429.122 of this part to an ALJ, who shall afford the respondent an opportunity for an agency hearing on the record.

(b) After consideration of all matters of record in the proceeding, the ALJ will issue a recommended decision, if appropriate, recommending a civil penalty. The decision will include a statement of the findings and conclusions, and the reasons therefore, on all material issues of fact, law, and discretion.

(c)(1) The General Counsel (or delegee) shall adopt, modify, or set aside the conclusions of law or discretion contained in the ALJ's recommended decision and shall set forth a final order assessing a civil penalty. The General Counsel (or delegee) shall include in the final order the ALJ's findings of fact and the reasons for the final agency actions.

(2) Any person against whom a penalty is assessed under this section may, within 60 calendar days after the date of the final order assessing such penalty, institute an action in the United States Court of Appeals for the appropriate judicial circuit for judicial review of such order in accordance with chapter 7 of title 5, United States Code. The court shall have jurisdiction to enter a judgment affirming, modifying, or setting aside in whole or in part, the final order, or the court may remand the proceeding to the Department for such further action as the court may direct.

### § 429.128 Immediate issuance of order assessing civil penalty.

(a) If the respondent elects to forgo an agency hearing pursuant to § 429.124, the General Counsel (or delegee) shall issue an order assessing the civil penalty proposed in the notice of proposed penalty under § 429.122, 30 calendar days after the respondent's receipt of the notice of proposed penalty.

(b) If within 60 calendar days of receiving the assessment order in paragraph (a) of this section the respondent does not pay the civil penalty amount, DOE shall institute an action in the appropriate United States District Court for an order affirming the assessment of the civil penalty. The court shall have authority to review de novo the law and the facts involved and shall have jurisdiction to enter a judgment enforcing, modifying, and enforcing as so modified, or setting aside in whole or in part, such assessment.

### § 429.130 Collection of civil penalties.

If any person fails to pay an assessment of a civil penalty after it has become a final and unappealable order under § 429.126 or after the appropriate District Court has entered final judgment in favor of the Department under § 429.128, the General Counsel (or delegee) shall institute an action to recover the amount of such penalty in any appropriate District Court of the United States. In such action, the validity and appropriateness of such final assessment order or judgment shall not be subject to review.

### § 429.132 Compromise and settlement.

(a) DOE may compromise, modify, or remit, with or without conditions, any civil penalty (with leave of court if necessary).

(b) In exercising its authority under paragraph (a) of this section, DOE may consider the nature and seriousness of the violation, the efforts of the respondent to remedy the violation in a timely manner, and other factors as justice may require.

(c) DOE's authority to compromise, modify or remit a civil penalty may be exercised at any time prior to a final decision by the United States Court of Appeals if § 429.126 procedures are utilized, or prior to a final decision by the United States District Court, if § 429.128 procedures are utilized.

(d) Notwithstanding paragraph (a) of this section, DOE or the respondent may propose to settle the case. If a settlement is agreed to by the parties, the respondent is notified and the case is closed in accordance with the terms of the settlement.

### § 429.134 Product-specific enforcement provisions.

(a) *General.* The following provisions apply to assessment and enforcement testing of the relevant products and equipment.

(b) *Refrigerators, refrigerator-freezers, and freezers*—(1) *Verification of total refrigerated volume.* The total refrigerated volume of the basic model will be measured pursuant to the test requirements of 10 CFR part 430 for each unit tested. The results of the measurement(s) will be averaged and compared to the value of total refrigerated volume certified by the manufacturer. The certified total refrigerated volume will be considered valid only if:

(i) The measurement is within two percent, or 0.5 cubic feet (0.2 cubic feet for compact products), whichever is greater, of the certified total refrigerated volume, or

(ii) The measurement is greater than the certified total refrigerated volume.

(A) If the certified total refrigerated volume is found to be valid, the certified adjusted total volume will be used as the basis for calculation of maximum allowed energy use for the basic model.

(B) If the certified total refrigerated volume is found to be invalid, the average measured adjusted total volume, rounded to the nearest 0.1 cubic foot, will serve as the basis for calculation of maximum allowed energy use for the tested basic model.

(2) *Test for models with two compartments, each having its own user-operable temperature control.* The test described in section 5.2(b) of the applicable test procedure for refrigerators or refrigerator-freezers in appendix A to subpart B of 10 CFR part 430 shall be used for all units of a tested basic model before DOE makes a determination of noncompliance with respect to the basic model.

(c) *Clothes washers*—(1) *Determination of Remaining Moisture Content*. These provisions address anomalous remaining moisture content (RMC) results that are not representative of a basic model's performance, as well as differences in RMC values that may result from DOE using a different test cloth lot than was used by the manufacturer for testing and certifying the basic model.

(i) When testing according to appendix J to subpart B of part 430:

(A) If the measured RMC value of a tested unit is equal to or lower than the certified RMC value of the basic model (expressed as a percentage), then the measured RMC value will be considered the tested unit's final RMC value and will be used as the basis for the calculation of per-cycle energy consumption for removal of moisture from the test load for that unit.

(B) If the measured RMC value of a tested unit is higher than the certified RMC value of the basic model but the difference between the measured and certified RMC values would not affect the unit's compliance with the applicable standards, then the measured RMC value will be considered the tested unit's final RMC value.

(C) If the measured RMC value of a tested unit is higher than the certified RMC value of the basic model and the difference between the measured and certified RMC values would affect the unit's compliance with the applicable standards, then:

(*1*) If DOE used the same test cloth lot that was used by the manufacturer for testing and certifying the basic model, then the measured RMC value will be considered the tested unit's final RMC value.

(*2*) If DOE used a different test cloth lot than was used by the manufacturer for testing and certifying the basic model, then:

(*i*) If the measured RMC value of a tested unit is higher than the certified RMC value of the basic model by more than three RMC percentage points, then a value three RMC percentage points less than the measured RMC value will be considered the tested unit's final RMC value.

(*ii*) If the measured RMC value of a tested unit is higher than the certified RMC value of the basic model, but by no more than three RMC percentage points, then the certified RMC value of the basic model will be considered the tested unit's final RMC value.

(ii) When testing according to appendix J2 to subpart B of part 430:

(A) The procedure for determining remaining moisture content (RMC) will be performed once in its entirety, pursuant to the test requirements of section 3.8 of appendix J2 to subpart B of part 430, for each unit tested.

(B) If the measured RMC value of a tested unit is equal to or lower than the certified RMC value of the basic model (expressed as a percentage), then the measured RMC value will be considered the tested unit's final RMC value and will be used as the basis for the calculation of per-cycle energy consumption for removal of moisture from the test load for that unit.

(C) If the measured RMC value of a tested unit is higher than the certified RMC value of the basic model but by no more than two RMC percentage points and the difference between the measured and certified RMC values would not affect the unit's compliance with the applicable standards, then the measured RMC value will be considered the tested unit's final RMC value.

(D) If the measured RMC value of a tested unit is higher than the certified RMC value of the basic model but by no more than two RMC percentage points and the difference between the measured and certified RMC values would affect the unit's compliance with the applicable standards, then:

(*1*) If DOE used the same test cloth lot that was used by the manufacturer for testing and certifying the basic model, then the measured RMC value will be considered the tested unit's final RMC value.

(*2*) If DOE used a different test cloth lot than was used by the manufacturer for testing and certifying the basic model, then the certified RMC value of the basic model would be considered the tested unit's final RMC value.

(E) If the measured RMC value of a tested unit is higher than the certified RMC value of the basic model by more than two RMC percentage points, then DOE will perform two replications of the RMC measurement procedure, each

pursuant to the provisions of section 3.8.5 of appendix J2 to subpart B of part 430, for a total of three independent RMC measurements of the tested unit. The average of the three RMC measurements will be calculated.

(*1*) If the average of the three RMC measurements is equal to or lower than the certified RMC value of the basic model, then the average RMC value will be considered the tested unit's final RMC value.

(*2*) If the average of the three RMC measurements is higher than the certified RMC value of the basic model but the difference between the measured and certified RMC values would not affect the unit's compliance with the applicable standards, then the average RMC value will be considered the tested unit's final RMC value.

(*3*) If the average of the three RMC measurements is higher than the certified RMC value of the basic model and the difference between the measured and certified RMC values would affect the unit's compliance with the applicable standards, then DOE will apply paragraph (c)(1)(ii)(F) of this section.

(F) If the average of the three RMC measurements is higher than the certified RMC value of the basic model and the difference between the measured and certified RMC values would affect the unit's compliance with the applicable standards, then:

(*1*) If DOE used the same test cloth lot that was used by the manufacturer for testing and certifying the basic model, then the average RMC pursuant to paragraph (c)(1)(ii)(E) of this section will be considered the tested unit's final RMC value.

(*2*) If DOE used a different test cloth lot than was used by the manufacturer for testing and certifying the basic model, then:

(*i*) If the average RMC value pursuant to paragraph (c)(1)(ii)(D) of this section is higher than the certified valued of the basic model by more than three RMC percentage points, then a value three RMC percentage points less than the average RMC value will be considered the tested unit's final RMC value.

(*ii*) If the average RMC value pursuant to paragraph (c)(1)(ii)(D) of this section is higher than the certified RMC value of the basic model, but by no more than three RMC percentage points, then the certified RMC value of the basic model will be considered the tested unit's final RMC value.

(2) [Reserved]

(d) *Residential Water Heaters and Residential-Duty Commercial Water Heaters*—(1) *Verification of first-hour rating and maximum GPM rating.* The first-hour rating or maximum gallons per minute (GPM) rating of the basic model will be measured pursuant to the test requirements of 10 CFR part 430 for each unit tested. The mean of the measured values will be compared to the rated values of first-hour rating or maximum GPM rating as certified by the manufacturer. The certified rating will be considered valid only if the measurement is within five percent of the certified rating.

(i) If the rated value of first-hour rating or maximum GPM rating is found to be within 5 percent of the mean of the measured values, then the rated value will be used as the basis for determining the applicable draw pattern pursuant to the test requirements of 10 CFR part 430 for each unit tested.

(ii) If the rated value of first-hour rating or maximum GPM rating is found to vary more than 5 percent from the measured values, then the mean of the measured values will serve as the basis for determining the applicable draw pattern pursuant to the test requirements of 10 CFR part 430 for each unit tested.

(2) *Verification of rated storage volume.* The storage volume of the basic model will be measured pursuant to the test requirements of appendix E to subpart B of 10 CFR part 430 for each unit tested. The mean of the measured values will be compared to the rated storage volume as certified by the manufacturer. The rated value will be considered valid only if the measurement is within 3 percent of the certified rating.

(i) If the rated storage volume is found to be within 3 percent of the mean of the measured value of storage volume, then the rated value will be used as the basis for calculation of the required uniform energy factor for the basic model.

(ii) If the rated storage volume is found to vary more than 3 percent from

the mean of the measured values, then the mean of the measured values will be used as the basis for calculation of the required uniform energy factor for the basic model.

(3) *Verification of fuel input rate.* The fuel input rate of each tested unit of the basic model will be measured pursuant to the test requirements of section 5.2.3 of 10 CFR part 430, subpart B, appendix E. The measured fuel input rate (either the measured fuel input rate for a single unit sample or the average of the measured fuel input rates for a multiple unit sample) will be compared to the rated input certified by the manufacturer. The certified rated input will be considered valid only if the measured fuel input rate is within ±2 percent of the certified rated input.

(i) If the certified rated input is found to be valid, then the certified rated input will be used to determine compliance with the associated energy conservation standard.

(ii) If the measured fuel input rate for gas-fired or oil-fired water heating products is not within ±2 percent of the certified rated input, the measured fuel input rate will be used to determine compliance with the associated energy conservation standard.

(4) *Circulating water heaters.* A storage tank for testing will be selected as described in paragraphs (d)(4)(i) and (ii) of this section. The effective storage volume of the circulating water heater determined in testing will be measured in accordance with appendix E to subpart B of 10 CFR part 430 with the storage tank that is used for testing.

(i) *Electric heat pump circulating water heaters.* For UEF and first-hour rating testing, electric heat pump circulating water heaters will be tested with a minimally-compliant electric storage water heater (as defined at § 430.2 of this chapter) that has a rated storage volume of between 25 and 35 gallons, and is in the low draw pattern, as determined in accordance with appendix E to subpart B of 10 CFR part 430 and the standards set at § 430.32(d) of this chapter. If the manufacturer certifies the specific model of electric storage water heater used for testing to determine the certified UEF and first-hour rating of the electric heat pump circulating water heater, that model of electric storage water heater will be used for testing. If this is not possible (such as if the electric storage water heater model is no longer available or has been discontinued), testing will be performed with an electric storage water heater that has a minimally-compliant UEF rating, in the low draw pattern, and a rated storage volume that is within ± 3 gallons of the rated storage volume of the electric storage water heater used to determine the certified ratings of the electric heat pump circulating water heater (but not less than 25 gallons and not greater than 35 gallons). If no such model is available, then testing will be performed with a minimally-compliant electric storage water heater that has a rated storage volume of between 25 and 35 gallons and is in the low draw pattern.

(ii) *All other circulating water heaters.* For UEF and first-hour rating testing, circulating water heaters are paired with unfired hot water storage tanks (''UFHWSTs'') that have certified storage volumes between 80 and 120 gallons and are at exactly the minimum thermal insulation standard, in terms of R-value, for UFHWSTs, as per the standards set at § 431.110(a) of this chapter. Testing will be performed as follows:

(A) If the manufacturer certifies the specific model of UFHWST used for testing to determine the certified UEF and first-hour rating of the circulating water heater, that model of UFHWST will be used for testing.

(B) If it is not possible to perform testing with the same model of UFHWST certified by the manufacturer, testing will be carried out with a different model of UFHWST accordingly:

(1) Testing will be performed with an UFHWST from the same manufacturer as the certified UFHWST, with the same certified storage volume as the certified UFHWST, and with a certified R-value that meets but does not exceed the standard set at § 431.110(a) of this chapter. If this is not possible,

(2) Testing will be performed with an UFHWST from a different manufacturer than the certified UFHWST, with the same certified storage volume as the certified UFHWST, and with a certified R-value that meets but does not

exceed the standard set at § 431.110(a) of this chapter. If this is not possible,

(3) Testing will be performed with an UFHWST from the same manufacturer as the certified UFHWST, having a certified storage volume within ±5 gallons of the certified UFHWST, and with a certified R-value that meets but does not exceed the standard set at § 431.110(a) of this chapter. If this is not possible,

(4) Testing will be performed with an UFHWST from a different manufacturer than the certified UFHWST, having a certified storage volume within ±5 gallons of the certified UFHWST, and with a certified R-value that meets but does not exceed the standard set at § 431.110(a) of this chapter. If this is not possible,

(5) Testing will be performed with an UFHWST having a certified storage volume between 80 gallons and 120 gallons and with a certified R-value that meets but does not exceed the standard set at § 431.110(a) of this chapter.

(e) *Packaged terminal air conditioners and packaged terminal heat pumps*—(1) *Verification of cooling capacity*. The total cooling capacity of the basic model will be measured pursuant to the test requirements of 10 CFR part 431 for each unit tested. The results of the measurement(s) will be averaged and compared to the value of cooling capacity certified by the manufacturer. The certified cooling capacity will be considered valid only if the average measured cooling capacity is within five percent of the certified cooling capacity.

(i) If the certified cooling capacity is found to be valid, that cooling capacity will be used as the basis for calculation of minimum allowed EER (and minimum allowed COP for PTHP models) for the basic model.

(ii) If the certified cooling capacity is found to be invalid, the average measured cooling capacity will serve as the basis for calculation of minimum allowed EER (and minimum allowed COP for PTHP models) for the tested basic model.

(2) [Reserved]

(f) *Dehumidifiers*—(1) *Verification of capacity*. The capacity will be measured pursuant to the test requirements of part 430 for each unit tested. The results of the measurement(s) will be averaged and compared to the value of capacity certified by the manufacturer for the basic model. The certified capacity will be considered valid only if the measurement is within five percent, or 1.00 pint per day, whichever is greater, of the certified capacity.

(i) If the certified capacity is found to be valid, the certified capacity will be used as the basis for determining the minimum energy factor or integrated energy factor allowed for the basic model.

(ii) If the certified capacity is found to be invalid, the average measured capacity of the units in the sample will be used as the basis for determining the minimum energy factor or integrated energy factor allowed for the basic model.

(2) *Verification of whole-home dehumidifier case volume*. The case volume will be measured pursuant to the test requirements of part 430 for each unit tested. The results of the measurement(s) will be averaged and compared to the value of case volume certified by the manufacturer for the basic model. The certified case volume will be considered valid only if the measurement is within two percent, or 0.2 cubic feet, whichever is greater, of the certified case volume.

(i) If the certified case volume is found to be valid, the certified case volume will be used as the basis for determining the minimum integrated energy factor allowed for the basic model.

(ii) If the certified case volume is found to be invalid, the average measured case volume of the units in the sample will be used as the basis for determining the minimum integrated energy factor allowed for the basic model.

(g) *Commercial package air conditioning and heating equipment (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h)*. Before May 15, 2025, the provisions in 10 CFR 429.134, revised as of January 1, 2024, are applicable. On and after May 15, 2025, the following provisions apply.

(1) *Verification of cooling capacity*. The cooling capacity of each tested unit of

the basic model will be measured pursuant to the test requirements of appendix A or appendix A1 to subpart F of part 431. The mean of the cooling capacity measurement(s) will be used to determine the applicable standards for purposes of compliance.

(2) *Specific components.* For assessment and enforcement testing of models subject to energy conservation standards denominated in terms of IVEC and IVHE, if a basic model includes individual models with components listed at table 7 to § 429.43(a)(3)(vi)(A) and DOE is not able to obtain an individual model with the least number (which could be zero) of those components within an otherwise comparable model group (as defined in § 429.43(a)(3)(vi)(A)(*1*)), DOE may test any individual model within the otherwise comparable model group.

(3) *Verification of cut-out and cut-in temperatures.* For assessment and enforcement testing of models of commercial package air conditioning and heating equipment subject to energy conservation standards denominated in terms of IVHE, the cut-out and cut-in temperatures may be verified using the method in appendix H to AHRI 1340–2023 (incorporated by reference, see § 429.4). If this method is conducted, the cut-in and cut-out temperatures determined using this method will be used to calculate IVHE for purposes of compliance.

(h) *Residential boilers—test protocols for functional verification of automatic means for adjusting water temperature.* These tests are intended to verify the functionality of the design requirement that a boiler has an automatic means for adjusting water temperature for single-stage, two-stage, and modulating boilers. These test methods are intended to permit the functional testing of a range of control strategies used to fulfill this design requirement. Section 2, *Definitions*, and paragraph 6.1.a of appendix EE to subpart B of part 430 of this chapter apply for the purposes of this paragraph (h).

(1) *Test protocol for all products other than single-stage products employing burner delay.* This test is intended to verify whether an automatic means for adjusting water temperature other than burner delay produces an incremental change in water supply temperature in response to an incremental change in inferred heat load.

(i) *Boiler setup*—(A) *Boiler installation.* Boiler installation in the test room shall be in accordance with the setup and apparatus requirements of section 6 of appendix EE to subpart B of 10 CFR part 430.

(B) *Establishing flow rate and temperature rise.* Start the boiler without enabling the means for adjusting water temperature. Establish a water flow rate that allows for a water temperature rise of greater than or equal to 20 °F at maximum input rate.

(C) *Temperature stabilization.* Temperature stabilization is deemed to be obtained when the boiler supply water temperature does not vary by more than ±3 °F over a period of five minutes.

(D) *Adjust the inferential load controller.* (*1*) Adjust the boiler controls (in accordance with the I&O manual) to the default setting that allows for activation of the means for adjusting water temperature. For boiler controls that do not allow for control adjustment during active mode operation, terminate call for heat and adjust the inferential load controller in accordance with the I&O manual and then reinitiate call for heat.

(*2*) If the means for adjusting water temperature uses outdoor temperature reset, the maximum outdoor temperature setting (if equipped) should be set to a temperature high enough that the boiler operates continuously during the duration of this test (*i.e.*, if the conditions in paragraph (h)(1)(ii)(A) of this section equal room ambient temperature, then the maximum outdoor temperature should be set at a temperature greater than the ambient air temperature during the test).

(ii) *Establish low inferred load conditions at minimum boiler supply water temperature*—(A) *Establish low inferred load conditions.* (*1*) Establish the inferred load conditions (simulated using a controlling parameter, such as outdoor temperature, thermostat patterns, or boiler cycling) so that the supply water temperature is maintained at the minimum supply water temperature prescribed by the boiler manufacturer's

temperature reset control strategy found in the I&O manual.

(*2*) The minimum supply water temperature of the default temperature reset curve is usually provided in the I&O manual. If there is no recommended minimum supply water temperature, set the minimum supply water temperature equal to 20 °F less than the high supply water temperature specified in paragraph (h)(1)(iii)(A) of this section.

(B) *Supply water temperature stabilization at low inferred load.* (*1*) Maintain the call for heat until the boiler supply water temperature has stabilized. Temperature stabilization is deemed to be obtained when the boiler supply water temperature does not vary by more than ±3 °F over a period of five minutes. The duration of time required to stabilize the supply water, following the procedure in paragraph (h)(1)(ii)(A) of this section, is dependent on the reset strategy and may vary from model to model.

(*2*) Record the boiler supply water temperature while the temperature is stabilized.

(iii) *Establish high inferred load conditions at maximum boiler supply water temperature*—(A) *Establish high inferred load conditions.* Establish the inferred load conditions so that the supply water temperature is set to the maximum allowable supply water temperature as prescribed in the I&O manual, or if there is no recommendation, set to a temperature greater than 170 °F.

(B) *Supply water temperature stabilization at high inferred load.* (*1*) Maintain the call for heat until the boiler supply water temperature has stabilized. Temperature stabilization is deemed to be obtained when the boiler supply water temperature does not vary by more than ±3 °F over a period of five minutes. The duration of time required to stabilize the supply water, following the procedure in paragraph (h)(1)(iii)(A) of this section, is dependent on the reset strategy and may vary from model to model.

(*2*) Record the boiler supply water temperature while the temperature is stabilized.

(*3*) Terminate the call for heat.

(iv) [Reserved]

(2) *Test protocol for single-stage products employing burner delay.* This test will be used in place of paragraph (h)(1) of this section for products manufacturers have certified to DOE under § 429.18(b)(3) as employing a burner delay automatic means strategy. This test verifies whether the automatic means in single-stage boiler products establishes a burner delay upon a call for heat until the means has determined that the inferred heat load cannot be met by the residual heat of the water in the system.

(i) *Boiler setup*—(A) *Boiler installation.* Boiler installation in the test room shall be in accordance with the setup and apparatus requirements by section 6.0 of appendix EE to subpart B of 10 CFR part 430.

(B) *Activation of controls.* Adjust the boiler controls in accordance with the I&O manual at the default setting that allows for activation of the means for adjusting water temperature.

(C) *Adjustment of water flow and temperature.* The flow and temperature of inlet water to the boiler shall be capable of being adjusted manually.

(ii) *Boiler heat-up*—(A) *Boiler start-up.* Power up the boiler and initiate a call for heat.

(B) *Adjustment of firing rate.* Adjust the boiler's firing rate to within ±5% of its maximum rated input.

(C) *Establishing flow rate and temperature rise.* Adjust the water flow through the boiler to achieve a $\Delta T$ of 20 °F (±2 °F) or greater with an inlet water temperature equal to 140 °F (±2 °F).

(D) *Terminate the call for heating.* Terminate the call for heat, stop the flow of water through the boiler, and record the time at termination.

(iii) *Verify burner delay*—(A) *Reinitiate call for heat.* Within three (3) minutes of termination (paragraph (h)(2)(ii)(D) of this section) and without adjusting the inlet water flow rate or temperature as specified in paragraph (h)(2)(ii)(C) of this section, reinitiate the call for heat and water flow and record the time.

(B) *Verify burner ignition.* At 15-second intervals, record time and supply water temperature until the main burner ignites.

(C) *Terminate the call for heat.*

(iv) [Reserved]

(i) *Pumps*—(1) *General purpose pumps.* (i) The volume rate of flow (flow rate) at BEP and nominal speed of rotation of each tested unit of the basic model will be measured pursuant to the test requirements of § 431.464 of this chapter, where the value of volume rate of flow (flow rate) at BEP and nominal speed of rotation certified by the manufacturer will be treated as the expected BEP flow rate. The results of the measurement(s) will be compared to the value of volume rate of flow (flow rate) at BEP and nominal speed of rotation certified by the manufacturer. The certified volume rate of flow (flow rate) at BEP and nominal speed of rotation will be considered valid only if the measurement(s) (either the measured volume rate of flow (flow rate) at BEP and nominal speed of rotation for a single unit sample or the average of the measured flow rates for a multiple unit sample) is within five percent of the certified volume rate of flow (flow rate) at BEP and nominal speed of rotation.

(A) If the representative value of volume rate of flow (flow rate) at BEP and nominal speed of rotation is found to be valid, the measured volume rate of flow (flow rate) at BEP and nominal speed of rotation will be used in subsequent calculations of constant load pump energy rating ($PER_{CL}$) and constant load pump energy index ($PEI_{CL}$) or variable load pump energy rating ($PER_{VL}$) and variable load pump energy index ($PEI_{VL}$) for that basic model.

(B) If the representative value of volume rate of flow (flow rate) at BEP and nominal speed of rotation is found to be invalid, the mean of all the measured volume rate of flow (flow rate) at BEP and nominal speed of rotation values determined from the tested unit(s) will serve as the new expected BEP flow rate and the unit(s) will be retested until such time as the measured rate of flow (flow rate) at BEP and nominal speed of rotation is within 5 percent of the expected BEP flow rate.

(ii) DOE will test each pump unit according to the test method specified by the manufacturer in the certification report submitted pursuant to § 429.59(b); if the model of pump unit was rated using an AEDM, DOE may use either a testing approach or calculation approach.

(2) *Dedicated-purpose pool pumps.* (i) The rated hydraulic horsepower of each tested unit of the basic model of dedicated-purpose pool pump will be measured pursuant to the test requirements of § 431.464(b) of this chapter and the result of the measurement(s) will be compared to the value of rated hydraulic horsepower certified by the manufacturer. The certified rated hydraulic horsepower will be considered valid only if the measurement(s) (either the measured rated hydraulic horsepower for a single unit sample or the average of the measured rated hydraulic horsepower values for a multiple unit sample) is within 5 percent of the certified rated hydraulic horsepower.

(A) If the representative value of rated hydraulic horsepower is found to be valid, the value of rated hydraulic horsepower certified by the manufacturer will be used to determine the standard level for that basic model.

(B) If the representative value of rated hydraulic horsepower is found to be invalid, the mean of all the measured rated hydraulic horsepower values determined from the tested unit(s) will be used to determine the standard level for that basic model.

(ii) To verify the self-priming capability of non-self-priming pool filter pumps and of self-priming pool filter pumps that are not certified with NSF/ANSI 50–2015 (incorporated by reference, see § 429.4) as self-priming, the vertical lift and true priming time of each tested unit of the basic model of self-priming or non-self-priming pool filter pump will be measured pursuant to the test requirements of § 431.464(b) of this chapter.

(A) For self-priming pool filter pumps that are not certified with NSF/ANSI 50–2015 as self-priming, at a vertical lift of 5.0 feet, the result of the true priming time measurement(s) will be compared to the value of true priming time certified by the manufacturer. The certified value of true priming time will be considered valid only if the measurement(s) (either the measured true priming time for a single unit sample or the average of true priming time values for a multiple unit

sample) is within 5 percent of the certified value of true priming time.

(*1*) If the representative value of true priming time is found to be valid, the value of true priming time certified by the manufacturer will be used to determine the appropriate equipment class and standard level for that basic model.

(*2*) If the representative value of true priming time is found to be invalid, the mean of the values of true priming time determined from the tested unit(s) will be used to determine the appropriate equipment class and standard level for that basic model.

(B) For non-self-priming pool filter pumps, at a vertical lift of 5.0 feet, the result of the true priming time measurement(s) (either the measured true priming time for a single unit sample or the average of true priming time values, for a multiple unit sample) will be compared to the value of true priming time referenced in the definition of non-self-priming pool filter pump at § 431.462 (10.0 minutes).

(*1*) If the measurement(s) of true priming time are greater than 95 percent of the value of true priming time referenced in the definition of non-self-priming pool filter pump at § 431.462 with a vertical lift of 5.0 feet, the DPPP model will be considered a non-self-priming pool filter pump for the purposes of determining the appropriate equipment class and standard level for that basic model.

(*2*) If the conditions specified in paragraph (i)(2)(ii)(B)(*1*) of this section are not satisfied, then the DPPP model will be considered a self-priming pool filter pump for the purposes of determining the appropriate equipment class and standard level for that basic model.

(iii) To verify the maximum head of self-priming pool filter pump, non-self-priming pool filter pumps, and waterfall pumps, the maximum head of each tested unit of the basic model of self-priming pool filter pump, non-self-priming pool filter pump, or waterfall pump will be measured pursuant to the test requirements of § 431.464(b) of this chapter and the result of the measurement(s) will be compared to the value of maximum head certified by the manufacturer. The certified value of maximum head will be considered valid only if the measurement(s) (either the measured maximum head for a single unit sample or the average of the maximum head values for a multiple unit sample) is within 5 percent of the certified values of maximum head.

(A) If the representative value of maximum head is found to be valid, the value of maximum head certified by the manufacturer will be used to determine the appropriate equipment class and standard level for that basic model.

(B) If the representative value of maximum head is found to be invalid, the measured value(s) of maximum head determined from the tested unit(s) will be used to determine the appropriate equipment class and standard level for that basic model.

(iv) To verify that a DPPP model complies with the applicable freeze protection control design requirements, the initiation temperature, runtime, and speed of rotation of the default control configuration of each tested unit of the basic model of dedicated-purpose pool pump will be evaluated according to the procedure specified in paragraph (i)(2)(iv)(A) of this section:

(A)(*1*) Set up and configure the dedicated-purpose pool pump under test according to the manufacturer instructions, including any necessary initial priming, in a test apparatus as described in appendix A of HI 40.6–2014–B (incorporated by reference, see § 429.4), except that the ambient temperature registered by the freeze protection ambient temperature sensor will be able to be measured and controlled by, for example, exposing the freeze protection temperature sensor to a specific temperature by submerging the sensor in a water bath of known temperature, by adjusting the actual ambient air temperature of the test chamber and measuring the temperature at the freeze protection ambient temperature sensor location, or by other means that allows the ambient temperature registered by the freeze protection temperature sensor to be reliably simulated, varied, and measured. Do not adjust the default freeze protection control settings or enable the freeze protection control if it is shipped disabled.

(*2*) Activate power to the pump with the flow rate set to zero (*i.e.*, the pump is energized but not circulating water). Set the ambient temperature to 42.0 ± 0.5 °F and allow the temperature to stabilize, where stability is determined in accordance with section 40.6.3.2.2 of HI 40.6–2014–B. After 5 minutes, decrease the temperature measured by the freeze protection temperature sensor by 1.0 ± 0.5 °F and allow the temperature to stabilize. After each reduction in ambient temperature and subsequent stabilization, record the DPPP rotating speed, if any, and freeze protection ambient temperature reading, where the ''freeze protection ambient temperature reading'' is representative of the temperature measured by the freeze protection ambient temperature sensor, which may be recorded by a variety of means depending on how the temperature is being simulated and controlled. If no flow is initiated, record zero rpm or no flow. Continue decreasing the temperature measured by the freeze protection temperature sensor by 1.0 ± 0.5 °F after 5.0 minutes of stable operation at the previous temperature reading until the pump freeze protection initiates water circulation or until the ambient temperature of 38.0 ± 0.5 °F has been evaluated (*i.e.*, the end of the 5.0 minute interval of 38.0 °F), whichever occurs first.

(*3*) If and when the DPPP freeze protection controls initiate water circulation, increase the ambient temperature reading registered by the freeze protection temperature sensor to a temperature of 42.0 ± 0.5 °F and maintain that temperature for 60.0 minutes. Do not modify or interfere with the operation of the DPPP freeze protection operating cycle. After 60.0 minutes, record the freeze protection ambient temperature and rotating speed, if any, of the dedicated-purpose pool pump under test.

(B) If the dedicated-purpose pool pump initiates water circulation at a temperature greater than 40.0 °F; if the dedicated-purpose pool pump was still circulating water after 60.0 minutes of operation at 42.0 ± 0.5 °F; or if rotating speed measured at any point during the DPPP freeze protection control test in paragraph (i)(2)(iii)(A) of this section was greater than one-half of the maximum rotating speed of the DPPP model certified by the manufacturer, that DPPP model is deemed to not comply with the design requirement for freeze protection controls.

(C) If none of the conditions specified in paragraph (i)(2)(iv)(B) of this section are met, including if the DPPP freeze protection control does not initiate water circulation at all during the test, the dedicated-purpose pool pump under test is deemed compliant with the design requirement for freeze protection controls.

(3) *Circulator pumps.* (i) The flow rate at BEP and maximum speed of each tested unit of the basic model will be measured pursuant to the test requirements of § 431.464(c) of this chapter, where the value of flow rate at BEP and maximum speed certified by the manufacturer will be treated as the expected BEP flow rate at maximum speed. The resulting measurement(s) will be compared to the value of flow rate at BEP and maximum speed certified by the manufacturer. The certified flow rate at BEP and maximum speed will be considered valid only if the measurement (either the measured flow rate at BEP and maximum speed for a single unit sample or the average of the measured flow rates for a multiple unit sample) is within 5 percent of the certified flow rate at BEP and maximum speed.

(A) If the representative value of flow rate is found to be valid, the measured flow rate at BEP and maximum speed will be used in subsequent calculations of circulator energy rating (CER) and circulator energy index (CEI) for that basic model.

(B) If the representative value of flow rate at BEP and maximum speed is found to be invalid, the mean of all the measured values of flow rate at BEP and maximum speed determined from the tested unit(s) will serve as the new expected BEP flow rate and the unit(s) will be retested until such time as the measured flow rate at BEP and maximum speed is within 5 percent of the expected BEP flow rate.

(ii) The rated hydraulic horsepower of each tested unit of the basic model will be measured pursuant to the test requirements of § 431.464(c) of this chapter. The resulting measurement will be

compared to the rated hydraulic horsepower certified by the manufacturer. The certified rated hydraulic horsepower will be considered valid only if the measurement (either the measured rated hydraulic horsepower for a single unit sample or the average of the measured rated hydraulic horsepower values for a multiple unit sample) is within 5 percent of the certified rated hydraulic horsepower.

(A) If the certified rated hydraulic horsepower is found to be valid, the certified rated hydraulic horsepower will be used as the basis for determining scope of applicability for that model.

(B) If the certified rated hydraulic horsepower is found to be invalid, the arithmetic mean of all the hydraulic horsepower values resulting from DOE's testing will be used as the basis for determining scope of applicability for that model.

(iii) DOE will test each circulator pump unit according to the control setting with which the unit was rated. If no control setting is specified and no controls were available, DOE will test using the full speed test. If no control setting is specified and a variety of controls are available, DOE will test using the test method for any one of the control varieties available on board.

(iv) DOE will test each circulator pump using the description and equation for the control curve with which it was rated, if available.

(j) *Refrigerated bottled or canned beverage vending machines*—(1) *Verification of refrigerated volume.* The refrigerated volume (V) of each tested unit of the basic model will be measured pursuant to the test requirements of 10 CFR 431.296. The results of the measurement(s) will be compared to the representative value of refrigerated volume certified by the manufacturer. The certified refrigerated volume will be considered valid only if the measurement(s) (either the measured refrigerated volume for a single unit sample or the average of the measured refrigerated volumes for a multiple unit sample) is within five percent of the certified refrigerated volume.

(i) If the representative value of refrigerated volume is found to be valid, the certified refrigerated volume will be used as the basis for calculation of maximum daily energy consumption for the basic model.

(ii) If the representative value of refrigerated volume is found to be invalid, the average measured refrigerated volume determined from the tested unit(s) will serve as the basis for calculation of maximum daily energy consumption for the tested basic model.

(2) *Verification of surface area, transparent, and non-transparent areas.* The percent transparent surface area on the front side of the basic model will be measured pursuant to these requirements for the purposes of determining whether a given basic model meets the definition of Class A or Combination A, as presented at 10 CFR 431.292. The transparent and non-transparent surface areas shall be determined on the front side of the beverage vending machine at the outermost surfaces of the beverage vending machine cabinet, from edge to edge, excluding any legs or other protrusions that extend beyond the dimensions of the primary cabinet. Determine the transparent and non-transparent areas on each side of a beverage vending machine as described in paragraphs (j)(2)(i) and (ii) of this section. For combination vending machines, disregard the surface area surrounding any refrigerated compartments that are not designed to be refrigerated (as demonstrated by the presence of temperature controls), whether or not it is transparent. Determine the percent transparent surface area on the front side of the beverage vending machine as a ratio of the measured transparent area on that side divided by the sum of the measured transparent and non-transparent areas, multiplying the result by 100.

(*i*) *Determination of transparent area.* Determine the total surface area that is transparent as the sum of all surface areas on the front side of a beverage vending machine that meet the definition of transparent at 10 CFR 431.292. When determining whether or not a particular wall segment is transparent, transparency should be determined for the aggregate performance of all the materials between the refrigerated volume and the ambient environment; the

composite performance of all those materials in a particular wall segment must meet the definition of transparent for that area be treated as transparent.

(*ii*) *Determination of non-transparent area.* Determine the total surface area that is not transparent as the sum of all surface areas on the front side of a beverage vending machine that are not considered part of the transparent area, as determined in accordance with paragraph (j)(2)(i) of this section.

(k) *Central air conditioners and heat pumps*—(1) *Verification of cooling capacity.* The cooling capacity of each tested unit of the individual model (for single-package systems) or individual combination (for split systems) will be measured pursuant to the test requirements of § 430.23(m) of this chapter. The mean of the measurement(s) (either the measured cooling capacity for a single unit sample or the average of the measured cooling capacities for a multiple unit sample) will be used to determine the applicable standards for purposes of compliance.

(2) *Verification of* $C_D$ value. (i) For central air conditioners and heat pumps other than models of outdoor units with no match, if manufacturers certify that they did not conduct the optional tests to determine the CC and/or CH value for an individual model (for single-package systems) or individual combination (for split systems), as applicable, the default CC and/or CH value will be used as the basis for calculation of SEER or HSPF for each unit tested. If manufacturers certify that they conducted the optional tests to determine the CC and/or CH value for an individual model (for single-package systems) or individual combination (for split systems), as applicable, the CC and/or CH value will be measured pursuant to the test requirements of § 430.23(m) of this chapter for each unit tested and the result for each unit tested (either the tested value or the default value, as selected according to the criteria for the cyclic test in 10 CFR part 430, subpart B, appendix M, section 3.5e) used as the basis for calculation of SEER or HSPF for that unit.

(ii) For models of outdoor units with no match, DOE will use the default CC and/or CH value pursuant to 10 CFR part 430.

(l) *Miscellaneous refrigeration products*—(1) *Verification of total refrigerated volume.* For all miscellaneous refrigeration products, the total refrigerated volume of the basic model will be measured pursuant to the test requirements of part 430 of this chapter for each unit tested. The results of the measurement(s) will be averaged and compared to the value of total refrigerated volume certified by the manufacturer. The certified total refrigerated volume will be considered valid only if:

(i) The measurement is within two percent, or 0.5 cubic feet (0.2 cubic feet for products with total refrigerated volume less than 7.75 cubic feet (220 liters)), whichever is greater, of the certified total refrigerated volume; or

(ii) The measurement is greater than the certified total refrigerated volume.

(A) If the certified total refrigerated volume is found to be valid, the certified adjusted total volume will be used as the basis for calculating the maximum allowed energy use for the tested basic model.

(B) If the certified total refrigerated volume is found to be invalid, the average measured adjusted total volume, rounded to the nearest 0.1 cubic foot, will serve as the basis for calculating the maximum allowed energy use for the tested basic model.

(2) *Test for models with two compartments, each having its own user-operable temperature control.* The test described in section 5.2(b) of the applicable test procedure in appendix A to subpart B part 430 of this chapter shall be used for all units of a tested basic model before DOE makes a determination of noncompliance with respect to the basic model.

(m) *Commercial packaged boilers*—(1) *Verification of fuel input rate.* The fuel input rate of each tested unit will be measured pursuant to the test requirements of § 431.86 of this chapter. The results of the measurement(s) will be compared to the value of rated input certified by the manufacturer. The certified rated input will be considered valid only if the measurement(s) (either the measured fuel input rate for a single unit sample or the average of

the measured fuel input rates for a multiple unit sample) is within two percent of the certified rated input.

(i) If the measured fuel input rate is within two-percent of the certified rated input, the certified rated input will serve as the basis for determination of the appropriate equipment class(es) and the mean measured fuel input rate will be used as the basis for calculation of combustion and/or thermal efficiency for the basic model.

(ii) If the measured fuel input rate for a gas-fired commercial packaged boiler is not within two-percent of the certified rated input, DOE will first attempt to increase or decrease the gas manifold pressure within the range specified in manufacturer's installation and operation manual shipped with the commercial packaged boiler being tested (or, if not provided in the manual, in supplemental instructions provided by the manufacturer pursuant to § 429.60(b)(4) of this chapter) to achieve the certified rated input (within two-percent). If the fuel input rate is still not within two-percent of the certified rated input, DOE will attempt to increase or decrease the gas inlet pressure within the range specified in manufacturer's installation and operation manual shipped with the commercial packaged boiler being tested (or, if not provided in the manual, in supplemental instructions provided by the manufacturer pursuant to § 429.60(b)(4)) to achieve the certified rated input (within two-percent). If the fuel input rate is still not within two-percent of the certified rated input, DOE will attempt to modify the gas inlet orifice if the unit is equipped with one. If the fuel input rate still is not within two percent of the certified rated input, the mean measured fuel input rate (either for a single unit sample or the average of the measured fuel input rates for a multiple unit sample) will serve as the basis for determination of the appropriate equipment class(es) and calculation of combustion and/or thermal efficiency for the basic model.

(iii) If the measured fuel input rate for an oil-fired commercial packaged boiler is not within two-percent of the certified rated input, the mean measured fuel input rate (either for a single unit sample or the average of the measured fuel input rates for a multiple unit sample) will serve as the basis for determination of the appropriate equipment class(es) and calculation of combustion and/or thermal efficiency for the basic model.

(2) *Models capable of producing both hot water and steam.* For a model of commercial packaged boiler that is capable of producing both hot water and steam, DOE may measure the thermal or combustion efficiency as applicable (see § 431.87 of this chapter) for steam and/or hot water modes. DOE will evaluate compliance based on the measured thermal or combustion efficiency in steam and hot water modes, independently.

(n) *Commercial water heating equipment other than residential-duty commercial water heaters*—(1) *Verification of fuel input rate.* The fuel input rate of each tested unit of the basic model will be measured pursuant to the test requirements of § 431.106 of this chapter. The measured fuel input rate (either the measured fuel input rate for a single unit sample or the average of the measured fuel input rates for a multiple unit sample) will be compared to the rated input certified by the manufacturer. The certified rated input will be considered valid only if the measured fuel input rate is within two percent of the certified rated input.

(i) If the certified rated input is found to be valid, then the certified rated input will serve as the basis for determination of the appropriate equipment class and calculation of the standby loss standard (as applicable).

(ii) If the measured fuel input rate for gas-fired commercial water heating equipment is not within two percent of the certified rated input, DOE will first attempt to increase or decrease the gas outlet pressure within 10 percent of the value specified on the nameplate of the model of commercial water heating equipment being tested to achieve the certified rated input (within 2 percent). If the fuel input rate is still not within two percent of the certified rated input, DOE will attempt to increase or decrease the gas supply pressure within the range specified on the nameplate of the model of commercial water heating equipment being tested. If the measured fuel input rate is still not within

two percent of the certified rated input, DOE will attempt to modify the gas inlet orifice, if the unit is equipped with one. If the measured fuel input rate still is not within two percent of the certified rated input, the measured fuel input rate will serve as the basis for determination of the appropriate equipment class and calculation of the standby loss standard (as applicable).

(iii) If the measured fuel input rate for oil-fired commercial water heating equipment is not within two percent of the certified rated input, the measured fuel input rate will serve as the basis for determination of the appropriate equipment class and calculation of the standby loss standard (as applicable).

(2) [Reserved]

(o) *Uninterruptible power supplies.* (1) Determine the UPS architecture by performing the tests specified in the definitions of VI, VFD, and VFI in sections 2.28.1 through 2.28.3 of appendix Y to subpart B of 10 CFR part 430.

(2) [Reserved]

(p) *Compressors*—(1) *Verification of full-load operating pressure.* (i) The maximum full-flow operating pressure of each tested unit of the basic model will be measured pursuant to the test requirements of appendix A to subpart T of part 431 of this chapter, where 90 percent of the value of full-load operating pressure certified by the manufacturer will be the starting point of the test method prior to increasing discharge pressure. The measured maximum full-flow operating pressure (either the single measured value for a single unit sample or the mean of the measured maximum full-flow operating pressures for a multiple unit sample) will be compared to the certified rating for full-load operating pressure to determine if the certified rating is valid or not. The certified rating for full-load operating pressure will be considered valid only if the certified rating for full-load operating pressure is less than or equal to the measured maximum full-flow operating pressure and greater than or equal to the lesser of—

(A) 90 percent of the measured maximum full-flow operating pressure; or

(B) 10 psig less than the measured maximum full-flow operating pressure.

(ii) If the certified full-load operating pressure is found to be valid, then the certified value will be used as the full-load operating pressure and will be the basis for determination of full-load actual volume flow rate, pressure ratio at full-load operating pressure, specific power, and package isentropic efficiency.

(iii) If the certified full-load operating pressure is found to be invalid, then the measured maximum full-flow operating pressure will be used as the full-load operating pressure and will be the basis for determination of full-load actual volume flow rate, pressure ratio at full-load operating pressure, specific power, and package isentropic efficiency.

(2) *Verification of full-load actual volume flow rate.* The measured full-load actual volume flow rate will be measured, pursuant to the test requirements of appendix A to subpart T of part 431 of this chapter, at the full-load operating pressure determined in paragraph (p)(1) of this section. The certified full-load actual volume flow rate will be considered valid only if the measurement(s) (either the measured full-load actual volume flow rate for a single unit sample or the mean of the measured values for a multiple unit sample) are within the percentage of the certified full-load actual volume flow rate specified in Table 1 of this section:

TABLE 1 OF § 429.134—ALLOWABLE PERCENTAGE DEVIATION FROM THE CERTIFIED FULL-LOAD ACTUAL VOLUME FLOW RATE

| Manufacturer certified full-load actual volume flow rate ($m^3/s$) × $10^{-3}$ | Allowable percent of the certified full-load actual volume flow rate (%) |
|---|---|
| 0 < and ≤ 8.3 | ±7 |
| 8.3 < and ≤ 25 | ±6 |
| 25 < and ≤ 250 | ±5 |
| > 250 | ±4 |

(i) If the certified value of full-load actual volume flow rate is found to be valid, the full-load actual volume flow rate certified by the manufacturer will be used as the basis for determination of the applicable standard.

(ii) If the certified value of full-load actual volume flow rate is found to be

invalid, the entire sample (one or multiple units) will be considered as failing the enforcement test.

(3) *Ancillary equipment.* Prior to testing each compressor, DOE will install any required ancillary equipment specified by the manufacturer in the certification report submitted pursuant to § 429.63(b).

(q) *Walk-in coolers and walk-in freezers.* Prior to October 31, 2023, the provisions in 10 CFR 429.134, revised as of January 1, 2022, are applicable. On and after October 31, 2023, the following provisions apply.(1) If DOE determines that a basic model of a panel, door, or refrigeration system for walk-in coolers or walk-in freezers fails to meet an applicable energy conservation standard, then the manufacturer of that basic model is responsible for the noncompliance. If DOE determines that a complete walk-in cooler or walk-in freezer or component thereof fails to meet an applicable energy conservation standard, then the manufacturer of that walk-in cooler or walk-in freezer is responsible for the noncompliance with the applicable standard, except that the manufacturer of a complete walk-in cooler or walk-in freezer is not responsible for the use of components that were certified and labeled (in accordance with DOE labeling requirements) as compliant by another party and later found to be noncompliant with the applicable standard(s).

(2) *Verification of refrigeration system net capacity.* The net capacity of the refrigeration system basic model will be measured pursuant to the test requirements of part 431, subpart R, appendix C of this chapter for each unit tested on and after October 31, 2023, but before the compliance date of revised energy conservation standards for walk-in cooler and walk-in freezer refrigeration systems. The net capacity of the refrigeration system basic model will be measured pursuant to the test requirements of part 431, subpart R, appendix C1 of this chapter for each unit tested on and after the compliance date of revised energy conservation standards for walk-in cooler and walk-in freezer refrigeration systems. The results of the measurement(s) will be averaged and compared to the value of net capacity certified by the manufacturer. The certified net capacity will be considered valid only if the average measured net capacity is within plus or minus five percent of the certified net capacity.

(3) *Verification of door surface area.* The surface area of a display door or non-display door basic model will be measured pursuant to the requirements of 10 CFR part 431, subpart R, appendix A for each unit tested. The results of the measurement(s) will be averaged and compared to the value of the surface area certified by the manufacturer. The certified surface area will be considered valid only if the average measured surface area is within plus or minus three percent of the certified surface area.

(i) If the certified surface area is found to be valid, the certified surface area will be used as the basis for calculating the maximum energy consumption (kWh/day) of the basic model.

(ii) If the certified surface area is found to be invalid, the average measured surface area will serve as the basis for calculating the maximum energy consumption (kWh/day) of the basic model.

(4) *Verification of door electricity-consuming device power.* For each basic model of walk-in cooler and walk-in freezer door, DOE will calculate the door's energy consumption using the input power listed on the nameplate of each electricity-consuming device shipped with the door. If an electricity-consuming device shipped with a walk-in door does not have a nameplate or the nameplate does not list the device's input power, then DOE will use the device's rated input power included in the door's certification report. If the door is not certified or if the certification does not include a rated input power for an electricity-consuming device shipped with a walk-in door, DOE will use the measured input power. DOE also may validate the power listed on the nameplate or the rated input power by measuring it when energized using a power supply that provides power within the allowable voltage range listed on the component nameplate or the door nameplate, whichever is available. If the measured input power is more than 10 percent higher than the input power listed on the nameplate or the rated

input power, as appropriate, then the measured input power shall be used in the door's energy consumption calculation.

(i) For electricity-consuming devices with controls, the maximum input wattage observed while energizing the device and activating the control shall be considered the measured input power. For anti-sweat heaters that are controlled based on humidity levels, the control may be activated by increasing relative humidity in the region of the controls without damaging the sensor. For lighting fixtures that are controlled with motion sensors, the control may be activated by simulating motion in the vicinity of the sensor. Other kinds of controls may be activated based on the functions of their sensor.

(ii) [Reserved]

(5) *Break-in period for refrigeration systems.* DOE will perform a compressor break-in period during assessment or enforcement testing using a duration specified by the manufacturer, not to exceed 20 hours, only if a break-in period duration is provided in the certification report.

(r) *Portable air conditioners. Verification of seasonally adjusted cooling capacity.* The seasonally adjusted cooling capacity will be measured pursuant to the test requirements of 10 CFR part 430 for each unit tested. The results of the measurement(s) will be averaged and compared to the value of seasonally adjusted cooling capacity certified by the manufacturer. The certified seasonally adjusted cooling capacity will be considered valid only if the average measured seasonally adjusted cooling capacity is within five percent of the certified seasonally adjusted cooling capacity.

(1) If the certified seasonally adjusted cooling capacity is found to be valid, the certified value will be used as the basis for determining the minimum allowed combined energy efficiency ratio for the basic model.

(2) If the certified seasonally adjusted cooling capacity is found to be invalid, the average measured seasonally adjusted cooling capacity will be used to determine the minimum allowed combined energy efficiency ratio for the basic model.

(s) *Direct Expansion-Dedicated Outdoor Air Systems.* (1) If a basic model includes individual models with components listed at table 1 to § 429.43(a)(3)(i)(A) and DOE is not able to obtain an individual model with the least number (which could be zero) of those components within an otherwise comparable model group (as defined in § 429.43(a)(3)(i)(A)(*1*)), DOE may test any individual model within the otherwise comparable model group.

(2) If the manufacturer certified testing in accordance with Option 1 using default VERS exhaust air transfer ratio (EATR) values or Option 2 using default VERS effectiveness and EATR values, DOE may determine the integrated seasonal moisture removal efficiency 2 (ISMRE2) and/or the integrated seasonal coefficient of performance 2 (ISCOP2) using the default values or by conducting testing to determine VERS performance according to the DOE test procedure in appendix B to subpart F of part 431 of this chapter (with the minimum purge angle and zero pressure differential between supply and return air).

(3) If the manufacturer certified testing in accordance with Option 1 using VERS exhaust air transfer ratio (EATR) values or Option 2 using VERS effectiveness and EATR values determined using an analysis tool certified in accordance with the DOE test procedure in appendix B to subpart F of part 431 of this chapter, DOE may conduct its own testing to determine VERS performance in accordance with the DOE test procedure in appendix B to subpart F of part 431 of this chapter.

(i) DOE would use the values of VERS performance certified to DOE (*i.e.* EATR, sensible effectiveness, and latent effectiveness) as the basis for determining the ISMRE2 and/or ISCOP2 of the basic model only if, for Option 1, the certified EATR is found to be no more than one percentage point less than the mean of the measured values (*i.e.* the difference between the measured EATR and the certified EATR is no more than 0.01), or for Option 2, all certified values of sensible effectiveness are found to be no greater than 105 percent of the mean of the measured values (*i.e.* the certified effectiveness divided by the measured effectiveness

is no greater than 1.05), all certified values of latent effectiveness are found to be no greater than 107 percent of the mean of the measured values, and the certified EATR is found to be no more than one percentage point less than the mean of the measured values.

(ii) If any of the conditions in paragraph (s)(2)(i) of this section do not hold true, then the mean of the measured values will be used as the basis for determining the ISMRE2 and/or ISCOP2 of the basic model.

(t) *Ceiling Fans*—(1) *Verification of blade span.* DOE will measure the blade span and round the measurement pursuant to the test requirements of 10 CFR part 430 of this chapter for each unit tested. DOE will consider the represented blade span valid only if the rounded measurement(s) (either the rounded measured value for a single unit, or the mean of the rounded measured values for a multiple unit sample, rounded to the nearest inch) is the same as the represented blade span.

(i) If DOE determines that the represented blade span is valid, that blade span will be used as the basis for determining the product class and calculating the minimum allowable ceiling fan efficiency.

(ii) If DOE determines that the represented blade span is invalid, DOE will use the rounded measured blade span(s) as the basis for determining the product class, and calculating the minimum allowable ceiling fan efficiency.

(2) *Verification of the distance between the ceiling and lowest point of fan blades.* DOE will measure the distance between the ceiling and lowest point of the fan blades and round the measurement pursuant to the test requirements of 10 CFR part 430 of this chapter for each unit tested. DOE will consider the represented distance valid only if the rounded measurement(s) (either the measured value for a single unit, or the mean of the measured values for a multiple unit sample, rounded to the nearest quarter inch) are the same as the represented distance.

(i) If DOE determines that the represented distance is valid, that distance will be used as the basis for determining the product class.

(ii) If DOE determines that the represented distance is invalid, DOE will use the rounded measured distance(s) as the basis for determining the product class.

(3) *Verification of blade revolutions per minute (RPM) measured at high speed.* DOE will measure the blade RPM at high speed pursuant to the test requirements of 10 CFR part 430 of this chapter for each unit tested. DOE will consider the represented blade RPM measured at high speed valid only if the measurement(s) (either the measured value for a single unit, or the mean of the measured values for a multiple unit sample, rounded to the nearest RPM) are within 2 percent of the represented blade RPM at high speed.

(i) If DOE determines that the represented RPM is valid, that RPM will be used as the basis for determining the product class.

(ii) If DOE determines that the represented RPM is invalid, DOE will use the rounded measured RPM(s) as the basis for determining the product class.

(4) *Verification of blade edge thickness.* DOE will measure the blade edge thickness and round the measurement pursuant to the test requirements of 10 CFR part 430 for each unit tested. DOE will consider the represented blade edge thickness valid only if the measurement(s) (either the measured value for a single unit, or the mean of the measured values for a multiple unit sample, rounded to the nearest 0.01 inch) are the same as the represented blade edge thickness.

(i) If DOE determines that the represented blade edge thickness is valid, that blade edge thickness will be used for determining product class.

(ii) If DOE determines that the represented blade edge thickness is invalid, DOE will use the rounded measured blade edge thickness(es) as the basis for determining the product class.

(u) *Battery chargers—verification of reported represented value obtained from testing in accordance with appendix Y1 of 10 CFR part 430 subpart B when using an external power supply.* If the battery charger basic model requires the use of an external power supply (''EPS''), and the manufacturer reported EPS is no longer available on the market, then DOE will test the battery charger with any compatible EPS that is minimally

compliant with DOE's energy conservation standards for EPSs as prescribed in § 430.32(w) of this subchapter and that meets the battery charger input power criteria.

(v) *Variable refrigerant flow multi-split air conditioners and heat pumps (other than air-cooled with rated cooling capacity less than 65,000 btu/h).* The following provisions apply for assessment and enforcement testing of models subject to standards in terms of IEER:

(1) *Specific components.* For each indoor unit model identified in the tested combination for which the model number certified in the STI does not fully specify the presence or absence of components listed at table 2 to 10 CFR 429.43(a)(3)(ii)(B), the following provision applies. If DOE is not able to obtain an individual model with the least number of those components, then DOE may test a system that includes any individual indoor unit model that has a model number consistent with the certified indoor unit model number.

(2) *Manufacturer involvement in assessment or enforcement testing.* A manufacturer's representative will be allowed to support commissioning and witness assessment and/or enforcement testing for variable refrigerant flow multi-split air conditioners and heat pumps, including during the controls verification procedures (CVPs) specified in paragraph (v)(3) of this section, with allowance for additional involvement as described in the following provisions.

(i) *Manufacturer involvement in CVP.* Control settings must be set by a member of the third-party laboratory consistent with the provisions in section 5.1 of appendix D1 to subpart F of 10 CFR part 431. Critical parameters must operate automatically from the system controls and must not be manually controlled or adjusted at any point by any party during the CVP.

(ii) *Manufacturer involvement in heating tests and IEER cooling tests.* All control settings other than critical parameters must be set by a member of the third-party laboratory consistent with the provisions of section 5.1 of appendix D1 to subpart F of 10 CFR part 431. In heating tests and IEER cooling tests, critical parameters may be manually controlled by a manufacturer's representative and initially set to their certified values as described in section 5.1 of appendix D1 to subpart F of 10 CFR part 431. During IEER cooling mode tests only, a manufacturer's representative may also make additional adjustments to the critical parameters as described in section 5.2 of appendix D1 to subpart F of 10 CFR part 431. Setting and adjustment of critical parameters by a manufacturer's representative must be monitored by third-party laboratory personnel using a service tool. Other than critical parameter adjustments made in accordance with section 5.3 of appendix D1 to subpart F of 10 CFR part 431, the manufacturer's representative must not make any other adjustments to the VRF multi-split system under test. If a manufacturer's representative is not present for testing, a member of the third-party laboratory must set and adjust critical parameters using the means of control provided by the manufacturer, as described in § 429.110(b)(1)(iv) for enforcement testing and § 429.104 for assessment testing.

(3) *Controls Verification Procedure (CVP).* This procedure validates the certified values of critical parameters for which positions may be manually set during the full- and part-load IEER cooling test conditions specified at appendix D1 to subpart F of 10 CFR part 431. The CVP will only be conducted for a single system.

(i) *Conducting the CVP*—The CVP will be conducted at all of the four IEER cooling test conditions as specified in appendix D1 to subpart F of 10 CFR part 431; the CVP is not conducted at any heating test conditions. The CVP will first be performed at the full-load cooling condition before being conducted at part-load cooling conditions and must be conducted per Appendix C of AHRI 1230–2021 (incorporated by reference, see § 429.4).

(ii) *Validating critical parameters*—At each load point, certified critical parameter values will be validated or invalidated according to Section C6 of AHRI 1230–2021 with the following amendments:

(A) The duration of the period used for validating certified critical parameter values must be whichever of the following is longer: three minutes, or

the time period needed to obtain five sample readings while meeting the minimum data collection interval requirements of Table C2 of AHRI 1230–2021.

(B) If at least one measurement period with duration identified in paragraph (v)(3)(ii)(A) of this section exists before $t_{OFF}$ that has an average root-sum-square (''RSS'') points total (as defined in Section 3.27 of AHRI 1230–2021) over the measurement period that is less than or equal to 70 points, the certified critical parameter values are valid.

(C) If no measurement period with duration identified in paragraph (v)(3)(ii)(A) of this section exists before $t_{OFF}$ that has an average RSS points total over the measurement period that is less than or equal to 70 points, the certified critical parameter values are invalid.

(iii) *Determining critical parameters for use in steady-state IEER cooling tests.* If, following a CVP, IEER testing is conducted per appendix D1 to subpart F of 10 CFR part 431, the following provisions apply:

(A) *Validated critical parameter settings.* At each load point, if certified critical parameter values are found to be valid according to the results of the CVP, initially set critical parameters to their certified values for the IEER test at the corresponding full- or part-load cooling condition. Perform additional adjustments to critical parameters as described in section 5.2 of appendix D1 to subpart F of 10 CFR part 431.

(B) *Invalidated critical parameter settings.* At each load point, if certified critical parameter values identified pursuant to paragraph (v)(3) of this section are found to be invalid according to the results of the CVP, determine alternate critical parameter values for use in the corresponding IEER test (as specified in appendix D1 to subpart F of 10 CFR part 431) as follows:

(*1*) Select the CVP measurement period—this period must have duration determined per paragraph (v)(3)(ii)(A) of this section and must be the period where the RSS points total has a lower average value over the measurement period than over any other time period in the CVP of the same duration. If multiple periods exist with the same RSS points total, select the measurement period closest to but before the time that the first indoor unit switches to thermally inactive (denoted as ''$t_{off}$'' in AHRI 1230–2021).

(*2*) Determine alternate critical parameters—calculate the average position for each critical parameter during the measurement period selected in paragraph (v)(3)(iii)(B)(*1*) of this section. When initially setting critical parameters per section 5.1 of appendix D1 to subpart F of 10 CFR part 431, instead of using the certified critical parameter values, use the alternate critical parameter values as control inputs. The same initial alternate critical parameter values must be used for all systems in the assessment/enforcement sample (though critical parameter adjustments as needed to achieve target capacity or sensible heat ratio (SHR) limits are made independently for each tested system, per paragraph (v)(3)(iii)(B)(*3*) of this section.

(*3*) For each system, determine whether critical parameter adjustments are needed to achieve the target capacity or SHR limit for an IEER cooling test. Perform critical parameter adjustments independently on each system as described in section 5.2 of appendix D1 to subpart F of 10 CFR part 431, with the following exceptions:

(*i*) Replace all references to ''certified critical parameter values'' with ''alternate critical parameter values'' as determined in paragraph (v)(3)(iii)(B) of this section.

(*ii*) Determine $CP_{Max}$ from a CVP conducted at full-load cooling conditions as the maximum value observed during the R2 period as described in Section C.4.4.2.3 of AHRI 1230–2021. If multiple components corresponding to a single parameter are present, determine $CP_{Max}$ at the point during the R2 period at which the average value across all components corresponding to that critical parameter is maximized.

(4) *Break-in period.* DOE will perform a compressor break-in period during assessment or enforcement testing using a duration specified by the manufacturer only if a break-in period duration is provided in the supplemental testing instructions.

(w) *Automatic commercial ice makers—verification of harvest rate.* The harvest rate will be measured pursuant to the test requirements of 10 CFR part 431 for each unit tested. The results of the measurement(s) will be averaged and compared to the value of harvest rate certified by the manufacturer of the basic model. The certified harvest rate will be considered valid only if the average measured harvest rate is within five percent of the certified harvest rate.

(1) If the certified harvest rate is found to be valid, the certified harvest rate will be used as the basis for determining the maximum energy use and maximum condenser water use, if applicable, allowed for the basic model.

(2) If the certified harvest rate is found to be invalid, the average measured harvest rate of the units in the sample will be used as the basis for determining the maximum energy use and maximum condenser water use, if applicable, allowed for the basic model.

(x) *Single package vertical air conditioners and heat pumps.* The following provisions apply for assessment and enforcement testing of models subject to standards in terms of IEER.

(1) *Verification of cooling capacity.* The cooling capacity of each tested unit of the basic model will be measured pursuant to the test requirements of appendix G1 to subpart F of 10 CFR part 431. The mean of the measurement(s) will be used to determine the applicable standards for purposes of compliance.

(2) *Specific components.* If a basic model includes individual models with components listed at table 4 to § 429.43(a)(3)(iii)(A) and DOE is not able to obtain an individual model with the least number (which could be zero) of those components within an otherwise comparable model group (as defined in § 429.43(a)(3)(iii)(A)(*1*)), DOE may test any individual model within the otherwise comparable model group.

(3) *Validation of outdoor ventilation airflow rate.* The outdoor ventilation airflow rate in cubic feet per minute (''CFM'') of the basic model will be measured in accordance with ASHRAE 41.2–1987 and Section 6.4 of ASHRAE 37–2009 (both incorporated by reference, see § 429.4). All references to the inlet shall be determined to mean the outdoor air inlet.

(i) The outdoor ventilation airflow rate validation shall be conducted at the conditions specified in Table 3 of AHRI 390–2021 (incorporated by reference, see § 429.4), Full Load Standard Rating Capacity Test, Cooling, except for the following:

The outdoor ventilation airflow rate shall be determined at 0 in. $H_2O$ external static pressure with a tolerance of $-0.00/+0.05$ in. $H_2O$.

(ii) When validating the outdoor ventilation airflow rate, the outdoor air inlet pressure shall be 0.00 in. $H_2O$, with a tolerance of $-0.00/+0.05$ in. $H_2O$ when measured against the room ambient pressure.

(y) *Air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h.* The following provisions apply for assessment and enforcement testing of models subject to standards in terms of SEER2 and HSPF2 (as applicable).

(1) *Verification of cooling capacity.* The cooling capacity of each tested unit of the individual model (for single-package units) or individual combination (for split systems) will be measured pursuant to the test requirements of appendix F1 to subpart F of part 431. The mean of the cooling capacity measurement(s) (either the measured cooling capacity for a single unit sample or the average of the measured cooling capacities for a multiple unit sample) will be used to determine the applicable standards for purposes of compliance.

(2) *Verification of $C_D$ value.* (i) For models other than models of outdoor units with no match, if manufacturers certify that they did not conduct the optional tests to determine the $C^c$ and/or $C^h$ value for an individual model (for single-package systems) or individual combination (for split systems), as applicable, the default value of $C^c$ and/or $C^h$ will be used as the basis for calculation of SEER2 or HSPF2 for each unit tested. If manufacturers certify that they conducted the optional tests to

determine the value of $C^c$ and/or $C^h$ for an individual model (for single-package systems) or individual combination (for split systems), as applicable, the value of $C^c$ and/or $C^h$ will be measured pursuant to the test requirements of appendix F1 to subpart F of part 431 for each unit tested. The result for each unit tested (either the tested value or the default value, as selected according to the criteria for the cyclic test in section 4 of appendix F1 to subpart F of part 431) will be used as the basis for calculation of SEER2 or HSPF2 for that unit.

(ii) For models of outdoor units with no match, DOE will use the default value of Cc and/or Ch specified in the test procedure in appendix F1 to subpart F of part 431.

(z) *Dishwashers*—(1) *Determination of Most Energy-Intensive Cycle.* For any dishwasher basic model that does not meet the specified cleaning index threshold at a given soil load, the most energy-intensive cycle will be determined through testing as specified in sections 4.1.1 and 5.2 of appendix C2 to subpart B of part 430.

(2) *Detergent dosing requirement.* For any dishwasher basic model certified in accordance with the test procedure at appendix C1 to subpart B of part 430 of this chapter, DOE will conduct enforcement testing using the detergent dosing requirement that was used by the manufacturer as the basis for certifying compliance with the applicable energy conservation standard, in accordance with the applicable test procedure and certification reporting requirements.

(aa) *Computer room air conditioners.* The following provisions apply for assessment and enforcement testing of models subject to energy conservation standards denominated in terms of NSenCOP.

(1) *Verification of net sensible cooling capacity.* The net sensible cooling capacity of each tested unit of the basic model will be measured pursuant to the test requirements of 10 CFR part 431, subpart F, appendix E1. The mean of the net sensible cooling capacity measurement(s) will be used to determine the applicable energy conservation standards for purposes of compliance.

(2) *Specific components.* If a basic model includes individual models with components listed at table 5 to § 429.43(a)(3)(iv)(A) and DOE is not able to obtain an individual model with the least number (which could be zero) of those components within an otherwise comparable model group (as defined in § 429.43(a)(3)(iv)(A)(*1*)), DOE may test any individual model within the otherwise comparable model group.

(bb) *Room air conditioners.* The cooling capacity will be measured pursuant to the test requirements of 10 CFR part 430 for each unit tested. The results of the measurement(s) will be averaged and compared to the value of cooling capacity certified by the manufacturer for the basic model. The certified cooling capacity will be considered valid only if the measurement is within five percent of the certified cooling capacity.

(1) If the certified cooling capacity is found to be valid, the certified cooling capacity will be used as the basis for determining the minimum combined energy efficiency ratio allowed for the basic model.

(2) If the certified cooling capacity is found to be invalid, the average measured cooling capacity of the units in the sample will be used as the basis for determining the minimum combined energy efficiency ratio allowed for the basic model.

(cc) *Pool heaters.* Beginning on May 30, 2028:

(1) *Verification of input capacity for gas-fired pool heaters.* The input capacity of each tested unit will be measured pursuant to the test requirements of § 430.23(p) of this subchapter. The results of the measurement(s) will be compared to the represented value of input capacity certified by the manufacturer for the basic model. The certified input capacity will be considered valid only if the measurement(s) (either the measured input capacity for a single unit sample or the average of the measured input capacity for a multiple unit sample) is within two percent of the certified input capacity.

(i) If the representative value of input capacity is found to be valid, the certified input capacity will serve as

the basis for determination of the applicable standard and the mean measured input capacity will be used as the basis for calculation of the integrated thermal efficiency standard for the basic model.

(ii) If the representative value of input capacity is not within two percent of the certified input capacity, DOE will first attempt to increase or decrease the gas pressure within the range specified in manufacturer's installation and operation manual shipped with the gas-fired pool heater being tested to achieve the certified input capacity (within two percent). If the input capacity is still not within two percent of the certified input capacity, DOE will attempt to modify the gas inlet orifice. If the input capacity still is not within two percent of the certified input capacity, the mean measured input capacity (either for a single unit sample or the average for a multiple unit sample) determined from the tested units will serve as the basis for calculation of the integrated thermal efficiency standard for the basic model.

(2) *Verification of active electrical power for electric pool heaters.* The active electrical power of each tested unit will be measured pursuant to the test requirements of § 430.23 of this subchapter. The results of the measurement(s) will be compared to the represented value of active electrical power city certified by the manufacturer for the basic model. The certified active electrical power will be considered valid only if the measurement(s) (either the measured active electrical power for a single unit sample or the average of the measured active electrical power for a multiple unit sample) is within five percent of the certified active electrical power.

(i) If the representative value of active electrical power is found to be valid, the certified active electrical power will serve as the basis for determination of the applicable standard and the mean measured active electrical power will be used as the basis for calculation of the integrated thermal efficiency standard for the basic model.

(ii) If the representative value of active electrical power is not within five percent of the certified active electrical power, the mean measured active electrical power (either for a single unit sample or the average for a multiple unit sample) determined from the tested units will serve as the basis for calculation of the integrated thermal efficiency standard for the basic model.

(dd) *Water-Source Heat Pumps.* The following provisions apply for assessment and enforcement testing of models subject to standards in terms of IEER and ACOP.

(1) *Verification of Cooling Capacity.* The cooling capacity of each tested unit of the basic model will be measured pursuant to the test requirements of appendix C1 to subpart F of 10 CFR part 431. The mean of the measurements will be used to determine the applicable standards for purposes of compliance.

(2) *Specific Components.* If a basic model includes individual models with components listed at table 6 to § 429.43(a)(3)(v)(A) and DOE is not able to obtain an individual model with the least number (which could be zero) of those components within an otherwise comparable model group (as defined in § 429.43(a)(3)(v)(A)(*1*)), DOE may test any individual model within the otherwise comparable model group.

(ee) *Dedicated-purpose pool pump motors.* (1) To verify the dedicated-purpose pool pump motor variable speed capability, a test in accordance with section 5 of UL 1004–10:2022 (incorporated by reference, see § 429.4) will be conducted.

(2) To verify that dedicated-purpose pool pump motor comply with the applicable freeze protection design requirements, a test in accordance with section 6 of UL 1004–10:2022 will be conducted.

(ff) *Commercial refrigerators, freezers, and refrigerator-freezers*—(1) *Verification of volume.* The volume will be measured pursuant to the test requirements of 10 CFR part 431 for each unit tested. The results of the measurement(s) will be averaged and compared to the value of the certified volume of the basic model. The certified volume will be considered valid only if the average measured volume is within five percent of the certified volume.

(i) If the certified volume is found to be valid, the certified volume will be used as the basis for determining the maximum daily energy consumption allowed for the basic model.

(ii) If the certified volume is found to be invalid, the average measured volume of the units in the sample will be used as the basis for determining the maximum daily energy consumption allowed for the basic model.

(2) *Verification of total display area.* The total display area will be measured pursuant to the test requirements of 10 CFR part 431 for each unit tested. The results of the measurement(s) will be averaged and compared to the value of the certified total display area of the basic model. The certified total display area will be considered valid only if the average measured total display area is within five percent of the certified total display area.

(i) If the certified total display area is found to be valid, the certified total display area will be used as the basis for determining the maximum daily energy consumption allowed for the basic model.

(ii) If the certified total display area is found to be invalid, the average measured total display area of the units in the sample will be used as the basis for determining the maximum daily energy consumption allowed for the basic model.

(3) *Determination of pull-down temperature application.* A classification of a basic model as pull-down temperature application will be considered valid only if a model meets the definition of ''pull-down temperature application'' specified in § 431.62 of this chapter as follows.

(i) 12-ounce beverage can temperatures will be measured for 12-ounce beverage cans loaded at the locations within the commercial refrigerator that are as close as possible to the locations that would be measured by test simulators according to the test procedure for commercial refrigerators specified in § 431.64 of this chapter.

(ii) The commercial refrigerator will be operated at ambient conditions consistent with those specified for commercial refrigerators in § 431.64 of this chapter and at the control setting necessary to achieve a stable integrated average temperature of 38 °F, prior to loading.

(iii) 12-ounce beverage cans to be fully loaded into the commercial refrigerator (with and without temperature measurements) will be maintained at 90 °F ±2 °F based on the average measured 12-ounce beverage can temperatures prior to loading into the commercial refrigerator.

(iv) The duration of pull-down (which must be 12 hours or less) will be determined starting from closing the commercial refrigerator door after completing the 12-ounce beverage can loading until the integrated average temperature reaches 38 °F ±2 °F.

(v) An average stable temperature of 38 °F will be determined by operating the commercial refrigerator for an additional 12 hours after initially reaching 38 °F ±2 °F with no changes to control settings, and determining an integrated average temperature of 38 °F ±2 °F at the end of the 12 hour stability period.

[79 FR 22348, Apr. 21, 2014, as amended at 79 FR 40566, July 11, 2014; 80 FR 37148, June 30, 2015; 80 FR 45824, July 31, 2015; 80 FR 46760, Aug. 5, 2015; 80 FR 79669, Dec. 23, 2015; 81 FR 2646, Jan. 15, 2016; 81 FR 15426, Mar. 23, 2016; 81 FR 24009, Apr. 25, 2016; 81 FR 37055, June 8, 2016; 81 FR 38395, June 13, 2016; 81 FR 46791, July 18, 2016; 81 FR 79320, Nov. 10, 2016; 81 FR 96236, Dec. 29, 2016; 81 FR 89304, Dec. 9, 2016; 81 FR 89822, Dec. 12, 2016; 81 FR 95800, Dec. 28, 2016; 82 FR 1100, Jan. 4, 2017; 82 FR 36919, Aug. 7, 2017; 85 FR 1446, Jan. 10, 2020; 86 FR 56820, Oct. 12, 2021; 87 FR 33379, June 1, 2022; 87 FR 45197, July 27, 2022; 87 FR 50423, Aug. 16, 2022; 87 FR 55122, Sept. 8, 2022; 87 FR 57298, Sept. 19, 2022; 87 FR 63895, Oct. 20, 2022; 87 FR 65667, 65899, Nov. 1, 2022; 87 FR 75167, Dec. 7, 2022; 87 FR 77324, Dec. 16, 2022; 88 FR 3276, Jan. 18, 2023; 88 FR 15537, Mar. 13, 2023; 88 FR 17975, Mar. 24, 2023; 88 FR 21838, Apr. 11, 2023; 88 FR 28837, May 4, 2023; 88 FR 40472, June 21, 2023; 88 FR 34362, May 26, 2023; 88 FR 34702, May 30, 2023; 88 FR 48357, July 27, 2023; 88 FR 66222, Sept. 26, 2023; 88 FR 67041, Sept. 28, 2023; 88 FR 84228, Dec. 4, 2023; 89 FR 37942, May 6, 2024; 89 FR 44035, May 20, 2024; 89 FR 82070, Oct. 9, 2024]

## REGIONAL STANDARDS ENFORCEMENT PROCEDURES

### § 429.140 Regional standards enforcement procedures.

Sections 429.140 through 429.158 provide enforcement procedures specific to the violations enumerated in

§ 429.102(c). These provisions explain the responsibilities of manufacturers, private labelers, distributors, contractors and dealers with respect to central air conditioners subject to regional standards; however, these provisions do not limit the responsibilities of parties otherwise subject to 10 CFR parts 429 and 430.

[81 FR 45402, July 14, 2016]

### § 429.142 Records retention.

(a) *Record retention.* The following entities must maintain the specified records—(1) *Contractors and dealers.* (i) Contractors and dealers must retain the following records for at least 48 months from the date of installation of a central air conditioner in the states of Alabama, Arizona, Arkansas, California, Delaware, Florida, Georgia, Hawaii, Kentucky, Louisiana, Maryland, Mississippi, Nevada, New Mexico, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, or Virginia or in the District of Columbia:

(A) *For split-system central air conditioner outdoor units:* The manufacturer name, model number, serial number, location of installation (including street address, city, state, and zip code), date of installation, and party from whom the unit was purchased (including person's name, full address, and phone number); and

(B) *For split-system central air conditioner indoor units:* The manufacturer name, model number, location of installation (including street address, city, state, and zip code), date of installation, and party from whom the unit was purchased (including person's name, full address, and phone number).

(ii) Contractors and dealers must retain the following, additional records for at least 48 months from the date of installation of a central air conditioner in the states of Arizona, California, Nevada, and New Mexico:

(A) *For single-package central air conditioners:* The manufacturer name, model number, serial number, location of installation (including street address, city, state, and zip code), date of installation, and party from whom the unit was purchased (including person's name, full address, and phone number).

(B) [Reserved]

(2) *Distributors.* Beginning July 1, 2016, all distributors must retain the following records for no less than 54 months from the date of sale:

(i) *For split-system central air conditioner outdoor units:* The outdoor unit manufacturer, outdoor unit model number, outdoor unit serial number, date unit was purchased from manufacturer, party from whom the unit was purchased (including company or individual's name, full address, and phone number), date unit was sold to contractor or dealer, party to whom the unit was sold (including company or individual's name, full address, and phone number), and, if delivered, delivery address.

(ii) *For single-package air conditioners:* The manufacturer, model number, serial number, date unit was purchased from manufacturer, party from whom the unit was purchased (including company or individual's name, full address, and phone number), date unit was sold to a contractor or dealer, party to whom the unit was sold (including company or individual's name, full address, and phone number), and, if delivered, delivery address.

(3) *Manufacturers and private labelers.* All manufacturers and private labelers must retain the following records for no less than 60 months from the date of sale:

(i) *For split system air conditioner outdoor units:* The model number, serial number, date of manufacture, date of sale, and party to whom the unit was sold (including person's name, full address, and phone number);

(ii) *For split system central air conditioner indoor units:* The model number, date of manufacture, date of sale, and party to whom the unit was sold (including person's name, full address, and phone number); and

(iii) *For single-package central air conditioners:* The model number, serial number, date of manufacture, date of sale, and party to whom the unit was sold (including person's name, full address, and phone number).

(b) [Reserved]

[81 FR 45402, July 14, 2016]

### § 429.144 Records request.

(a) DOE must have reasonable belief a violation has occurred to request

records specific to an on-going investigation of a violation of central air conditioner regional standards.

(b) Upon request, the manufacturer, private labeler, distributor, dealer, or contractor must provide to DOE the relevant records within 30 calendar days of the request.

(1) DOE, at its discretion, may grant additional time for records production if the party from whom records have been requested has made a good faith effort to produce records.

(2) To request additional time, the party from whom records have been requested must produce all records gathered in 30 days and provide to DOE a written explanation of the need for additional time with the requested date for completing the production of records.

[81 FR 45402, July 14, 2016]

### § 429.146 Notice of violation.

(a) If DOE determines a party has committed a violation of regional standards, DOE will issue a Notice of Violation advising that party of DOE's determination.

(b) If, however, DOE determines a noncompliant installation occurred in only one instance, the noncompliant installation is remediated prior to DOE issuing a Notice of Violation, and the party has no history of prior violations, DOE will not issue such notice.

(c) If DOE does not find a violation of regional standards, DOE will notify the party under investigation.

[81 FR 45403, July 14, 2016]

### § 429.148 Routine violator.

(a) DOE will consider, *inter alia,* the following factors in determining if a person is a routine violator: Number of violations in current and past cases, length of time over which violations occurred, ratio of compliant to noncompliant installations or sales, percentage of employees committing violations, evidence of intent, evidence of training or education provided, and subsequent remedial actions.

(b) In the event that DOE determines a person to be a routine violator, DOE will issue a Notice of Finding of Routine Violation.

(c) In making a finding of Routine Violation, DOE will consider whether the Routine Violation was limited to a specific location. If DOE finds that the routine violation was so limited, DOE may, in its discretion, in the Notice of Finding of Routine Violation limit the prohibition on manufacturer and/or private labeler sales to a particular contractor or distribution location.

[81 FR 45403, July 14, 2016]

### § 429.150 Appealing a finding of routine violation.

(a) Any person found to be a routine violator may, within 30 calendar days after the date of Notice of Finding of Routine Violation, request an administrative appeal to the Office of Hearings and Appeals.

(b) The appeal must present information rebutting the finding of violation(s).

(c) The Office of Hearings and Appeals will issue a decision on the appeal within 45 days of receipt of the appeal.

(d) A routine violator must file a Notice of Intent to Appeal with the Office of Hearings and Appeals within three business days of the date of the Notice of Finding of Routine Violation, serving a copy on the Office of the Assistant General Counsel for Enforcement to retain the ability to buy central air conditioners during the pendency of the appeal.

[81 FR 45403, July 14, 2016]

### § 429.152 Removal of finding of "routine violator".

(a) A routine violator may be removed from DOE's list of routine violators through completion of remediation in accordance with the requirements in § 429.154.

(b) A routine violator that wants to remediate must contact the Office of the Assistant General Counsel for Enforcement via the point of contact listed in the Notice of Finding of Routine Violation and identify the distributor(s), manufacturer(s), or private labeler(s) from whom it wishes to buy compliant replacement product.

(c) DOE will contact the distributor(s), manufacturer(s), or private labeler(s) and authorize sale of central

air conditioner units to the routine violator for purposes of remediation within 3 business days of receipt of the request for remediation. DOE will provide the manufacturer(s), distributor(s), and/or private labeler(s) with an official letter authorizing the sale of units for purposes of remediation.

(d) DOE will contact routine violators that requested units for remediation within 30 days of sending the official letter to the manufacturer(s), distributor(s), and/or private labeler(s) to determine the status of the remediation.

(e) If remediation is successfully completed, DOE will issue a Notice indicating a person is no longer considered to be a routine violator. The Notice will be issued no more than 30 days after DOE has received documentation demonstrating that remediation is complete.

[81 FR 45403, July 14, 2016]

### § 429.154 Remediation.

(a) Any party found to be in violation of the regional standards may remediate by replacing the noncompliant unit at cost to the violator; the end user cannot be charged for any costs of remediation.

(1) If a violator is unable to replace all noncompliant installations, then the Department may, in its discretion, consider the remediation complete if the violator satisfactorily demonstrates to the Department that it attempted to replace all noncompliant installations.

(2) The Department will scrutinize any ''failed'' attempts at replacement to ensure that there was indeed a good faith effort to complete remediation of the noncompliant unit.

(b) The violator must provide to DOE the serial number of any outdoor unit and/or indoor unit installed not in compliance with the applicable regional standard as well as the serial number(s) of the replacement unit(s) to be checked by the Department against warranty and other replacement claims.

(c) If the remediation is approved by the Department, then DOE will issue a Notice of Remediation and the violation will not count towards a finding of ''routine violator''.

[81 FR 45403, July 14, 2016]

### § 429.156 Manufacturer and private labeler liability.

(a) In accordance with § 429.102, paragraphs (a)(10) and (c), manufacturers and private labelers are prohibited from selling central air conditioners and heat pumps to a routine violator.

(1) To avoid financial penalties, manufacturers and/or private labelers must cease sales to a routine violator within 3 business days from the date of issuance of a Notice of Finding of Routine Violation.

(2) If a Routine Violator files a Notice of Intent to Appeal pursuant to § 429.150, then a manufacturer and/or private labeler may assume the risk of selling central air conditioners to the Routine Violator during the pendency of the appeal.

(3) If the appeal of the Finding of Routine Violator is denied, then the manufacturer and/or private labeler may be fined in accordance with § 429.120, for sale of any units to a routine violator during the pendency of the appeal that do not meet the applicable regional standard.

(b) If a manufacturer and/or private labeler has knowledge of routine violation, then the manufacturer can be held liable for all sales that occurred after the date the manufacturer had knowledge of the routine violation. However, if the manufacturer and/or private labeler reports its suspicion of a routine violation to DOE within 15 days of receipt of such knowledge, then it will not be liable for product sold to the suspected routine violator prior to reporting the routine violation to DOE.

[81 FR 45403, July 14, 2016]

### § 429.158 Product determined noncompliant with regional standards.

(a) If DOE determines a model of outdoor unit fails to meet the applicable regional standard(s) when tested in a combination certified by the same manufacturer, then the outdoor unit basic model will be deemed noncompliant with the regional standard(s). In accordance with § 429.102(a)(10), the outdoor unit manufacturer and/or private

labeler is liable for distribution of noncompliant units in commerce.

(b) If DOE determines a combination fails to meet the applicable regional standard(s) when tested in a combination certified by a manufacturer other than the outdoor unit manufacturer (e.g., ICM), then that combination is deemed noncompliant with the regional standard(s). In accordance with §429.102(a)(10), the certifying manufacturer is liable for distribution of noncompliant units in commerce.

(c) All such units manufactured and distributed in commerce are presumed to have been installed in a region where they would not comply with the applicable energy conservation standard; however, a manufacturer and/or private labeler may demonstrate through installer records that individual units were installed in a region where the unit is compliant with the applicable standards.

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## Appendix A to Subpart C of Part 429—Sampling Plan for Enforcement Testing of Covered Consumer Products and Certain High-Volume Commercial Equipment

(a) The first sample size ($n_1$) for enforcement testing must be four or more units, except as provided by §429.57(e)(1)(i).

(b) Compute the mean of the measured energy performance ($x_1$) for all tests as follows:

$$x_1 = \frac{1}{n_1}\left(\sum_{i=1}^{n_1} x_i\right) \quad [1]$$

where $x_i$ is the measured energy or water efficiency or consumption from test i, and $n_1$ is the total number of tests.

(c) Compute the standard deviation ($s_1$) of the measured energy performance from the $n_1$ tests as follows:

$$s_1 = \sqrt{\frac{\sum_{i=1}^{n_1}(x_i - x_1)^2}{n_1 - 1}} \quad [2]$$

(d) Compute the standard error ($s_{x1}$) of the measured energy performance from the $n_1$ tests as follows:

$$s_{x_1} = \frac{s_1}{\sqrt{n_1}} \quad [3]$$

(e)(1) Compute the upper control limit ($UCL_1$) and lower control limit ($LCL_1$) for the mean of the first sample using the applicable DOE energy efficiency standard (EES) as the desired mean and a probability level of 95 percent (two-tailed test) as follows:

$LCL_1$ EES — $ts_{X1\ x}$

$$LCL_1 = EES - ts_{x_1} \quad [4] \text{ and } UCL_1 = EES + ts_{x_1} \quad [5]$$

where t is the statistic based on a 95 percent two-tailed probability level with degrees of freedom ($n_1 - 1$).

(2) For an energy efficiency or water efficiency standard, compare the mean of the first sample ($x_1$) with the upper and lower control limits ($UCL_1$ and $LCL_1$) to determine one of the following:

(i) If the mean of the first sample is below the lower control limit, then the basic model is in noncompliance and testing is at an end. (Do not go on to any of the steps below.)

(ii) If the mean of the first sample is equal to or greater than the upper control limit, then the basic model is in compliance and testing is at an end. (Do not go on to any of the steps below.)

(iii) If the sample mean is equal to or greater than the lower control limit but less than the upper control limit, then no determination of compliance or noncompliance can be made and a second sample size is determined by Step (e)(3).

(3) For an energy efficiency or water efficiency standard, determine the second sample size ($n_2$) as follows:

$$n_2 = \left(\frac{ts_1}{0.05EES}\right)^2 - n_1 \quad [6]$$

where $s_1$ and t have the values used in equations 2 and 4, respectively. The term ''0.05 EES'' is the difference between the applicable energy efficiency or water efficiency standard and 95 percent of the standard, where 95 percent of the standard is taken as the lower control limit. This procedure yields a sufficient combined sample size ($n_1 + n_2$) to give an estimated 97.5 percent probability of obtaining a determination of compliance when the true mean efficiency is equal to the applicable standard. Given the solution value of $n_2$, determine one of the following:

(i) If the value of $n_2$ is less than or equal to zero and if the mean energy or water efficiency of the first sample ($x_1$) is either equal to or greater than the lower control limit ($LCL_1$) or equal to or greater than 95 percent of the applicable energy efficiency or water efficiency standard (EES), whichever is greater, *i.e.*, if $n_2 \leq 0$ and $x_1 \geq \max$ ($LCL_1$, 0.95 EES), the basic model is in compliance and testing is at an end.

(ii) If the value of $n_2$ is less than or equal to zero and the mean energy efficiency of the first sample ($x_1$) is less than the lower control limit ($LCL_1$) or less than 95 percent of the applicable energy or water efficiency standard (EES), whichever is greater, *i.e.*, if $n_2 \leq 0$ and $x_1 \leq \max$ ($LCL_1$, 0.95 EES), the basic model is not in compliance and testing is at an end.

(iii) If the value of $n_2$ is greater than zero, then, the value of the second sample size is determined to be the smallest integer equal to or greater than the solution value of $n_2$ for equation (6). If the value of $n_2$ so calculated is greater than $21 - n_1$, set $n_2$ equal to $21 - n_1$.

(4) Compute the combined mean ($x_2$) of the measured energy or water efficiency of the $n_1$ and $n_2$ units of the combined first and second samples as follows:

$$\bar{x}_2 = \frac{1}{n_1 + n_2}\left(\sum_{i=1}^{n_1+n_2} x_i\right) \quad [7]$$

(5) Compute the standard error ($S_{x2}$) of the measured energy or water performance of the $n_1$ and $n_2$ units in the combined first and second samples as follows:

$$s_{x_2} = \frac{s^1}{\sqrt{n_1 + n_2}} \qquad [8]$$

NOTE: $s_1$ is the value obtained in Step (c).

(6) For an energy efficiency standard (EES), compute the lower control limit ($LCL_2$) for the mean of the combined first and second samples using the DOE EES as the desired mean and a one-tailed probability level of 97.5 percent (equivalent to the two-tailed probability level of 95 percent used in Step (e)(1)) as follows:

$$LCL_2 = EES - ts_{x_2} \qquad [9]$$

where the t-statistic has the value obtained in Step (e)(1) and $s_{x2}$ is the value obtained in Step (e)(5).

(7) For an energy efficiency standard (EES), compare the combined sample mean ($x_2$) to the lower control limit ($LCL_2$) to determine one of the following:

(i) If the mean of the combined sample ($x_2$) is less than the lower control limit ($LCL_2$) or 95 percent of the applicable energy efficiency standard (EES), whichever is greater, *i.e.*, if $x_2$<max ($LCL_2$, 0.95 EES), the basic model is not compliant and testing is at an end.

(iii) If the mean of the combined sample ($x_2$) is equal to or greater than the lower control limit ($LCL_2$) or 95 percent of the applicable energy efficiency standard (EES), whichever is greater, *i.e.*, if $x_2$≥max ($LCL_2$, 0.95 EES), the basic model is in compliance and testing is at an end.

(f)(1) Compute the upper control limit ($UCL_1$) and lower control limit ($LCL_1$) for the mean of the first sample using the applicable DOE energy consumption standard (ECS) as the desired mean and a probability level of 95 percent (two-tailed test) as follows:

$$LCL_1 = ECS - ts_{x_1} \qquad \text{and } UCL_1 = ECS + ts_{x_1} \qquad [10]$$

where t is the statistic based on a 95 percent two-tailed probability level with degrees of freedom ($n_1 - 1$).

(2) For an energy or water consumption standard, compare the mean of the first sample ($x_1$) with the upper and lower control limits ($UCL_1$ and $LCL_1$) to determine one of the following:

(i) If the mean of the first sample is above the upper control limit, then the basic model is in noncompliance and testing is at an end. (Do not go on to any of the steps below.)

(ii) If the mean of the first sample is equal to or less than the lower control limit, then the basic model is in compliance and testing is at an end. (Do not go on to any of the steps below.)

(iii) If the sample mean is equal to or less than the upper control limit but greater than the lower control limit, then no determination of compliance or noncompliance can be made and a second sample size is determined by Step (f)(3).

(3) For an Energy or Water Consumption Standard, determine the second sample size ($n_2$) as follows:

$$n_2 = \left(\frac{ts_1}{0.05ECS}\right)^2 - n_1 \qquad [11]$$

where $s_1$and t have the values used in equations (2) and (10), respectively. The term ''0.05 ECS'' is the difference between the applicable energy or water consumption standard and 105 percent of the standard, where 105 percent of the standard is taken as the upper control limit. This procedure yields a sufficient combined sample size ($n_1 + n_2$) to give an estimated 97.5 percent probability of obtaining a determination of compliance

when the true mean consumption is equal to the applicable standard. Given the solution value of $n_2$, determine one of the following:

(i) If the value of $n_2$ is less than or equal to zero and if the mean energy or water consumption of the first sample ($x_1$) is either equal to or less than the upper control limit ($UCL_1$) or equal to or less than 105 percent of the applicable energy or water consumption standard (ECS), whichever is less, *i.e.*, if $n_2 \leq 0$ and $x_1 \leq \min$ ($UCL_1$, 1.05 ECS), the basic model is in compliance and testing is at an end.

(ii) If the value of $n_2$ is less than or equal to zero and the mean energy or water consumption of the first sample ($x_1$) is greater than the upper control limit ($UCL_1$) or more than 105 percent of the applicable energy or water consumption standard (ECS), whichever is less, *i.e.*, if $n_2 \leq 0$ and $x_1 > \min$ ($UCL_1$, 1.05 EPS), the basic model is not compliant and testing is at an end.

(iii) If the value of $n_2$ is greater than zero, then the value of the second sample size is determined to be the smallest integer equal to or greater than the solution value of $n_2$ for equation (11). If the value of $n_2$ so calculated is greater than $21-n_1$, set $n_2$ equal to $21-n_1$.

(4) Compute the combined mean ($x_2$) of the measured energy or water consumption of the $n_1$ and $n_2$ units of the combined first and second samples as follows:

$$\bar{x}_2 = \frac{1}{n_1 + n_2}\left(\sum_{i=1}^{n_1+n_2} x_i\right) \qquad [12]$$

(5) Compute the standard error ($S_{x2}$) of the measured energy or water consumption of the $n_1$ and $n_2$ units in the combined first and second samples as follows:

$$s_{x_2} = \frac{s^1}{\sqrt{n_1 + n_2}} \qquad [13]$$

NOTE: $s_1$ is the value obtained in Step (c).

(6) For an energy or water consumption standard (ECS), compute the upper control limit ($UCL_2$) for the mean of the combined first and second samples using the DOE ECS as the desired mean and a one-tailed probability level of 97.5 percent (equivalent to the two-tailed probability level of 95 percent used in Step (f)(1)) as follows:

$$UCL_1 = ECS + ts_{x_1} \qquad [14]$$

where the t-statistic has the value obtained in (f)(1).

(7) For an energy or water consumption standard (ECS), compare the combined sample mean ($x_2$) to the upper control limit ($UCL_2$) to determine one of the following:

(i) If the mean of the combined sample ($x_2$) is greater than the upper control limit ($UCL_2$) or 105 percent of the ECS whichever is less, *i.e.*, if $x_2 > \min$ ($UCL_2$, 1.05 ECS), the basic model is not compliant and testing is at an end.

(ii) If the mean of the combined sample ($x_2$) is equal to or less than the upper control limit ($UCL_2$) or 105 percent of the applicable energy or water performance standard (ECS), whichever is less, *i.e.*, if $x_2 \leq \min$ ($UCL_2$, 1.05 ECS), the basic model is in compliance and testing is at an end.

## APPENDIX B TO SUBPART C OF PART 429—SAMPLING PLAN FOR ENFORCEMENT TESTING OF COVERED EQUIPMENT AND CERTAIN LOW-VOLUME COVERED PRODUCTS

The Department will determine compliance as follows:

(a) The first sample size ($n_1$) must be four or more units, except as provided by § 429.57(e)(1)(ii).

(b) Compute the mean of the measured energy performance ($x_1$) for all tests as follows:

$$x_1 = \frac{1}{n_1}\left(\sum_{i=1}^{n_1} x_i\right) \quad [1]$$

where $x_i$ is the measured energy efficiency or consumption from test i, and $n_1$ is the total number of tests.

(c) Compute the standard deviation ($s_1$) of the measured energy performance from the $n_1$ tests as follows:

$$s_1 = \sqrt{\frac{\sum_{i=1}^{n_1}(x_i - x_1)^2}{n_1 - 1}} \quad [2]$$

(d) Compute the standard error ($s_{x1}$) of the measured energy performance from the $n_1$ tests as follows:

$$s_{x_1} = \frac{s_1}{\sqrt{n_1}} \quad [3]$$

(e)(1) For an energy efficiency standard (EES), determine the appropriate lower control limit ($LCL_1$) according to:

$$LCL_1 = EES - ts_{x_1} \quad [4a]$$

or

$$LCL_1 = 0.95EES, \quad [4b]$$

And use whichever is greater. Where EES is the energy efficiency standard and t is a statistic based on a 97.5 percent, one-sided confidence limit and a sample size of $n_1$.

(2) For an energy consumption standard (ECS), determine the appropriate upper control limit ($UCL_1$) according to:

$$UCL_1 = ECS + ts_{x_1} \quad [5a]$$

or

$$UCL_1 = 1.05ECS, \quad [5b]$$

And use whichever is less, where ECS is the energy consumption standard and t is a statistic based on a 97.5 percent, one-sided confidence limit and a sample size of $n_1$.

(f)(1) Compare the sample mean to the control limit.

(i) The basic model is in compliance and testing is at an end if:

(A) For an energy or water efficiency standard, the sample mean is equal to or greater than the lower control limit, or

(B) For an energy or water consumption standard, the sample mean is equal to or less than the upper control limit.

## APPENDIX C TO SUBPART C OF PART 429—SAMPLING PLAN FOR ENFORCEMENT TESTING OF DISTRIBUTION TRANSFORMERS

(a) When testing distribution transformers, the number of units in the sample ($m_1$) shall be in accordance with §429.47(a) and DOE shall perform the following number of tests:

(1) If DOE tests four or more units, it will test each unit once;

(2) If DOE tests two or three units, it will test each unit twice; or

(3) If DOE tests one unit, it will test that unit four times.

(b) DOE shall determine compliance as follows:

(1) Compute the mean ($X_1$) of the measured energy performance of the $n_1$ tests in the first sample as follows:

$$X_1 = \frac{1}{n_1}\sum_{i=1}^{n_1} X_i \qquad [1]$$

where $X_i$ is the measured efficiency of test i.

(2) Compute the sample standard deviation ($S_1$) of the measured efficiency of the $n_1$ tests in the first sample as follows:

$$S_1 = \sqrt{\sum_{i=1}^{n_1} \frac{(X_i - X_1)^2}{n_1 - 1}} \qquad [2]$$

(3) Compute the standard error ($SE(X_1)$) of the mean efficiency of the first sample as follows:

$$SE(X_1) = \frac{S_1}{\sqrt{n_1}} \qquad [3]$$

(4) Compute the sample size discount ($SSD(m_1)$) as follows:

$$SSD(m_1) = \frac{100}{1 + \left(1 + \frac{0.08}{\sqrt{m_1}}\right)\left(\frac{100}{RE} - 1\right)} \qquad [4]$$