PART 431—ENERGY EFFICIENCY PROGRAM FOR CERTAIN COMMERCIAL AND INDUSTRIAL EQUIPMENT

Subpart A—General Provisions

Subpart B—Electric Motors

Subpart C—Commercial Refrigerators, Freezers and Refrigerator-Freezers

Subpart D—Commercial Warm Air Furnaces

Subpart E—Commercial Packaged Boilers

Subpart F—Commercial Air Conditioners and Heat Pumps

AUTHORITY: 42 U.S.C. 6291–6317.

SOURCE: 64 FR 54141, Oct. 5, 1999, unless otherwise noted.

Subpart A—General Provisions

§ 431.1 Purpose and scope.

This part establishes the regulations for the implementation of provisions relating to commercial and industrial equipment in Part B of Title III of the Energy Policy and Conservation Act (42 U.S.C. 6291–6309) and in Part C of Title III of the Energy Policy and Conservation Act (42 U.S.C. 6311–6317), which establishes an energy conservation program for certain commercial and industrial equipment.

[70 FR 60414, Oct. 18, 2005]

§ 431.2 Definitions.

The following definitions apply for purposes of this part. Any words or terms not defined in this Section or elsewhere in this Part shall be defined as provided in Section 340 of the Act.

Act means the Energy Policy and Conservation Act of 1975, as amended, 42 U.S.C. 6291–6316.

Btu means British thermal unit, which is the quantity of heat required to raise the temperature of one pound of water by one degree Fahrenheit.

Covered equipment means any electric motor, as defined in § 431.12; commercial heating, ventilating, and air conditioning, and water heating product (HVAC & WH product), as defined in § 431.172; commercial refrigerator, freezer, or refrigerator-freezer, as defined in § 431.62; automatic commercial ice maker, as defined in § 431.132; commercial clothes washer, as defined in § 431.152; distribution transformer, as defined in § 431.192; illuminated exit sign, as defined in § 431.202; traffic signal module or pedestrian module, as defined in § 431.222; unit heater, as defined in § 431.242; commercial prerinse

spray valve, as defined in § 431.262; mercury vapor lamp ballast, as defined in § 431.282; refrigerated bottled or canned beverage vending machine, as defined in § 431.292; walk-in cooler and walk-in freezer, as defined in § 431.302; metal halide ballast and metal halide lamp fixture, as defined in § 431.322.

DOE or *the Department* means the U.S. Department of Energy.

EPCA means the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6291–6316.

Gas means propane or natural gas as defined by the Federal Power Commission.

Import means to import into the customs territory of the United States.

Independent laboratory means a laboratory or test facility not controlled by, affiliated with, having financial ties with, or under common control with the manufacturer or distributor of the covered equipment being evaluated.

ISO means International Organization for Standardization.

Manufacture means to manufacture, produce, assemble, or import.

Manufacturer means any person who manufactures industrial equipment, including any manufacturer of a commercial packaged boiler.

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

Secretary means the Secretary of Energy.

State means a State, the District of Columbia, Puerto Rico, or any territory or possession of the United States.

State regulation means a law or regulation of a State or political subdivision thereof.

[69 FR 61923, Oct. 21, 2004, as amended at 71 FR 71369, Dec. 8, 2006; 74 FR 12071, Mar. 23, 2009; 75 FR 666, Jan. 5, 2010]

Subpart B—Electric Motors

SOURCE: 69 FR 61923, Oct. 21, 2004, unless otherwise noted.

§ 431.11 Purpose and scope.

This subpart contains energy conservation requirements for electric motors. It contains test procedures that EPCA requires DOE to prescribe, related requirements, energy conservation standards prescribed by EPCA, labeling rules, and compliance procedures. It also identifies materials incorporated by reference in this part.

§ 431.12 Definitions.

The following definitions apply for purposes of this subpart, and of subparts K through M of this part. Any words or terms not defined in this Section or elsewhere in this Part shall be defined as provided in Section 340 of the Act.

Accreditation means recognition by an accreditation body that a laboratory is competent to test the efficiency of electric motors according to the scope and procedures given in Test Method B of Institute of Electrical and Electronics Engineers (IEEE) Standard 112–1996, *Test Procedure for Polyphase Induction Motors and Generators*, and Test Method (1) of CSA Standard C390–93, *Energy Efficient Test Methods for Three-Phase Induction Motors*. (Incorporated by reference, see § 431.15)

Accreditation body means an organization or entity that conducts and administers an accreditation system and grants accreditation.

Accreditation system means a set of requirements to be fulfilled by a testing laboratory, as well as rules of procedure and management, that are used to accredit laboratories.

Accredited laboratory means a testing laboratory to which accreditation has been granted.

Alternative efficiency determination method or *AEDM* means, with respect to an electric motor, a method of calculating the total power loss and average full load efficiency.

Average full load efficiency means the arithmetic mean of the full load efficiencies of a population of electric motors of duplicate design, where the full load efficiency of each motor in the population is the ratio (expressed as a percentage) of the motor's useful power output to its total power input when the motor is operated at its full rated

load, rated voltage, and rated frequency.

Basic model means, with respect to an electric motor, all units of a given type of electric motor (or class thereof) manufactured by a single manufacturer, and which have the same rating, have electrical characteristics that are essentially identical, and do not have any differing physical or functional characteristics which affect energy consumption or efficiency. For the purpose of this definition, "rating" means one of the 113 combinations of an electric motor's horsepower (or standard kilowatt equivalent), number of poles, and open or enclosed construction, with respect to which § 431.25 prescribes nominal full load efficiency standards.

Certificate of conformity means a document that is issued by a certification program, and that gives written assurance that an electric motor complies with the energy efficiency standard applicable to that motor, as specified in § 431.25.

Certification program means a certification system that determines conformity by electric motors with the energy efficiency standards prescribed by and pursuant to the Act.

Certification system means a system, that has its own rules of procedure and management, for giving written assurance that a product, process, or service conforms to a specific standard or other specified requirements, and that is operated by an entity independent of both the party seeking the written assurance and the party providing the product, process or service.

CSA means CSA International.

Definite purpose motor means any motor designed in standard ratings with standard operating characteristics or standard mechanical construction for use under service conditions other than usual, such as those specified in National Electrical Manufacturers Association (NEMA) Standards Publication MG1–1993 (MG1), *Motors and Generators*, paragraph 14.03, "Unusual Service Conditions," (Incorporated by reference, see § 431.15) or for use on a particular type of application, and which cannot be used in most general purpose applications.

Enclosed motor means an electric motor so constructed as to prevent the free exchange of air between the inside and outside of the case but not sufficiently enclosed to be termed airtight.

Fire pump motors [Reserved]

General purpose motor means any motor which is designed in standard ratings with either:

(1) Standard operating characteristics and standard mechanical construction for use under usual service conditions, such as those specified NEMA Standards Publication MG1–1993, paragraph 14.02, "Usual Service Conditions," (Incorporated by reference, see § 431.15) and without restriction to a particular application or type of application; or

(2) Standard operating characteristics or standard mechanical construction for use under unusual service conditions, such as those specified in NEMA Standards Publication MG1–1993, paragraph 14.03, "Unusual Service Conditions," (Incorporated by reference, see § 431.15) or for a particular type of application, and which can be used in most general purpose applications.

General purpose electric motor (subtype I) means any motor which is designed in standard ratings with either:

(1) Standard operating characteristics and standard mechanical construction for use under usual service conditions, such as those specified in NEMA Standards Publication MG1–1993, paragraph 14.02, "Usual Service Conditions," (incorporated by reference; see § 431.15) and without restriction to a particular application or type of application; or

(2) Standard operating characteristics or standard mechanical construction for use under unusual service conditions, such as those specified in NEMA Standards Publication MG1–1993, paragraph 14.03, "Unusual Service Conditions," (incorporated by reference; see § 431.15) or for a particular type of application, and which can be used in most general purpose applications.

General purpose electric motor (subtype II) means any motor incorporating the design elements of a general purpose electric motor (subtype I) that are configured as one of the following:

(i) A U-frame motor;

(ii) A design C motor;

(iii) A close-coupled pump motor;

(iv) A footless motor;

(v) A vertical solid shaft normal thrust motor (as tested in a horizontal configuration);

(vi) An 8-pole motor (900 rpm); or

(vii) A poly-phase motor with voltage of not more than 600 volts (other than 230 or 460 volts).

IEC means the International Electrotechnical Commission.

IEEE means the Institute of Electrical and Electronics Engineers, Inc.

NEMA means the National Electrical Manufacturers Association.

Nominal full load efficiency means, with respect to an electric motor, a representative value of efficiency selected from Column A of Table 12–8, NEMA Standards Publication MG1–1993, (Incorporated by reference, see § 431.15), that is not greater than the average full load efficiency of a population of motors of the same design.

NEMA design B general purpose electric motor [Reserved]

Open motor means an electric motor having ventilating openings which permit passage of external cooling air over and around the windings of the machine.

Special purpose motor means any motor, other than a general purpose motor or definite purpose motor, which has special operating characteristics or special mechanical construction, or both, designed for a particular application.

Total power loss means that portion of the energy used by an electric motor not converted to rotational mechanical power, expressed in percent.

[69 FR 61923, Oct. 21, 2004, as amended at 74 FR 12071, Mar. 23, 2009]

TEST PROCEDURES, MATERIALS INCORPORATED AND METHODS OF DETERMINING EFFICIENCY

§ 431.15 Materials incorporated by reference.

(a) *General.* We incorporate by reference the following test procedures into Subpart B of Part 431. The material listed in paragraph (b) of this section has been approved for incorporation by reference by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR 51. Any subsequent amendment to a standard by the standard-setting organization will not affect the DOE test procedures unless and until amended by DOE. Material is incorporated as it exists on the date of the approval and a notice of any change in the material will be published in the FEDERAL REGISTER.

(b) *List of standards incorporated by reference.* (1) The following provisions of National Electrical Manufacturers Association Standards Publication MG1–1993, *Motors and Generators*, with Revisions 1, 2, 3 and 4, IBR approved for §§ 431.12; 431.31 and appendix B to subpart B of Part 431:

(i) Section I, *General Standards Applying to All Machines*, Part 1, *Referenced Standards and Definitions*, paragraphs 1.16.1, 1.16.1.1, 1.17.1.1, 1.17.1.2, and 1.40.1, IBR approved for § 431.12;

(ii) Section I, *General Standards Applying to All Machines*, Part 4, *Dimensions, Tolerances, and Mounting*, paragraph 4.01 and Figures 4–1, 4–2, 4–3, and 4–4, IBR approved for § 431.12;

(iii) Section II, *Small (Fractional) and Medium (Integral) Machines*, Part 11, *Dimensions—AC and DC Small and Medium Machines*, paragraphs 11.01.2, 11.31 (except the lines for frames 447T, 447TS, 449T and 449TS), 11.32, 11.34 (except the line for frames 447TC and 449TC, and the line for frames 447TSC and 449TSC), 11.35, and 11.36 (except the line for frames 447TD and 449TD, and the line for frames 447TSD and 449TSD), and Table 11–1, IBR approved for § 431.12;

(iv) Section II, *Small (Fractional) and Medium (Integral) Machines*, Part 12, *Tests and Performance—AC and DC Motors*, paragraphs 12.35.1, 12.35.5, 12.38.1, 12.39.1, and 12.40.1, 12.58.1, and Tables 12–2 and 12–8, IBR approved for § 431.12; and

(v) Section II, *Small (Fractional) and Medium (Integral) Machines*, Part 14, *Application Data—AC and DC Small and Medium Machines*, paragraphs 14.02 and 14.03, IBR approved for § 431.12.

(2) Institute of Electrical and Electronics Engineers, Inc., Standard 112–1996, *Test Procedure for Polyphase Induction Motors and Generators*, Test Method B, *Input-Output with Loss Segregation*, and the correction to the calculation at item (28) in Section 10.2 Form B-Test Method B issued by IEEE on January 20, 1998. (Note: Paragraph 2 of appendix A to subpart B of Part 431 sets forth modifications to this Standard

when it is used for purposes of Part 431 and EPCA, IBR approved for §§ 431.12; 431.19; 431.20; appendix B to subpart B of Part 431.

(3) CSA International Standard C390–93, *Energy Efficiency Test Methods for Three-Phase Induction Motors*, Test Method (1), *Input-Output Method With Indirect Measurement of the Stray-Load Loss and Direct Measurement of the Stator Winding (I2R), Rotor Winding* (I^2R), *Core and Windage-Friction Losses*, IBR approved for §§ 431.12; 431.19; 431.20; appendix B to subpart B of Part 431.

(4) International Electrotechnical Commission Standard 60034–1 (1996), *Rotating electrical machines, Part 1: Rating and performance*, with Amendment 1 (1997), Section 3: *Duty*, clause 3.2.1 and figure 1, IBR approved for § 431.12.

(5) International Electrotechnical Commission Standard 60050–411 (1996), *International Electrotechnical Vocabulary Chapter 411: Rotating machines*, sections 411–33–07 and 411–37–26, IBR approved for § 431.12.

(6) International Electrotechnical Commission Standard 60072–1 (1991), *Dimensions and Output Series for Rotating Electrical Machines—Part 1: Frame numbers 56 to 400 and flange numbers 55 to 1080*, clauses 2, 3, 4.1, 6.1, 7, and 10, and Tables 1, 2 and 4, IBR approved for § 431.12.

(7) International Electrotechnical Commission Standard 60034–12 (1980), *Rotating Electrical Machines, Part 12: Starting performance of single-speed three-phase cage induction motors for voltages up to and including 660 V*, with Amendment 1 (1992) and Amendment 2 (1995), clauses 1, 2, 3.1, 4, 5, and 6, and Tables I, II, and III, IBR approved for § 431.12.

(c) *Inspection of standards.* The standards incorporated by reference are available for inspection at:

(1) National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html;*

(2) U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Hearings and Dockets, "Test Procedures, Labeling, and Certification Requirements for Electric Motors," Docket No. EE–RM–96–400, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC.

(d) *Availability of standards.* Standards incorporated by reference may be obtained from the following sources:

(1) Copies of IEEE Standard 112–1996 can be obtained from the Institute of Electrical and Electronics Engineers, Inc., 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855–1331, 1–800–678–IEEE (4333);

(2) Copies of NEMA Standards Publication MG1–1993 with Revisions 1, 2, 3, and 4, and copies of International Electrotechnical Commission standards can be obtained from Global Engineering Documents, 15 Inverness Way East, Englewood, Colorado 80112–5776, 1–800–854–7179 (within the U.S.) or (303) 397–7956 (international).

(3) Copies of CSA International Standard C390–93 can be obtained from CSA International, 5060 Spectrum Way, Mississauga, Ontario, Canada L4W5N6, (416) 747–4044;

(e) *Reference standards*—(1) *General.* The standards listed in this paragraph are referred to in the DOE procedures for testing laboratories, and recognition of accreditation bodies and certification programs but are not incorporated by reference. These sources are given here for information and guidance.

(2) *List of references.* (i) National Voluntary Laboratory Accreditation Program Handbooks 150, "Procedures and General Requirements," March 1994, and 150–10, "Efficiency of Electric Motors," August 1995. National Voluntary Laboratory Accreditation Program, National Institute of Standards and Technology, Gaithersburg, MD 20899.

(ii) ISO/IEC Guide 25, "General requirements for the competence of calibration and testing laboratories."

(iii) ISO 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."

(iv) ISO/IEC Guide 28, "General rules for a model third-party certification system for products."

(v) ISO/IEC Guide 58, "Calibration and testing laboratory accreditation systems—General requirements for operation and recognition."

(vi) ISO/IEC Guide 65, "General requirements for bodies operating product certification systems."

§ 431.16 Test procedures for the measurement of energy efficiency.

For purposes of 10 CFR Part 431 and EPCA, the test procedures for measuring the energy efficiency of an electric motor shall be the test procedures specified in appendix B to this subpart B.

§ 431.17 Determination of efficiency.

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 § 431.192.

(a) *Provisions applicable to all electric motors*—(1) *General requirements.* The average full load efficiency of each basic model of electric motor must be determined either by testing in accordance with § 431.16 of this subpart, or by application of an alternative efficiency determination method (AEDM) that meets the requirements of paragraphs (a)(2) and (3) of this section, provided, however, that an AEDM may be used to determine the average full load efficiency of one or more of a manufacturer's basic models only if the average full load efficiency of at least five of its other basic models is determined through testing.

(2) *Alternative efficiency determination method.* An AEDM applied to a basic model must be:

(i) Derived from a mathematical model that represents the mechanical and electrical characteristics of that basic model, and

(ii) Based on engineering or statistical analysis, computer simulation or modeling, or other analytic evaluation of performance data.

(3) *Substantiation of an alternative efficiency determination method.* Before an AEDM is used, its accuracy and reliability must be substantiated as follows:

(i) The AEDM must be applied to at least five basic models that have been tested in accordance with § 431.16, and

(ii) The predicted total power loss for each such basic model, calculated by applying the AEDM, must be within plus or minus ten percent of the mean total power loss determined from the testing of that basic model.

(4) *Subsequent verification of an AEDM.* (i) Each manufacturer shall periodically select basic models representative of those to which it has applied an AEDM, and for each basic model selected shall either:

(A) Subject a sample of units to testing in accordance with §§ 431.16 and 431.17(b)(2) by an accredited laboratory that meets the requirements of § 431.18;

(B) Have a certification body recognized under § 431.20 certify its nominal full load efficiency; or

(C) Have an independent state-registered professional engineer, who is qualified to perform an evaluation of electric motor efficiency in a highly competent manner and who is not an employee of the manufacturer, review the manufacturer's representations and certify that the results of the AEDM accurately represent the total power loss and nominal full load efficiency of the basic model.

(ii) Each manufacturer that has used an AEDM under this section shall have available for inspection by the Department of Energy records showing: the method or methods used; 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; complete test data, product information, and related information that the manufacturer has generated or acquired pursuant to paragraphs (a)(3) and (a)(4)(i) of this section; and the calculations used to determine the average full load efficiency and total power losses of each basic model to which the AEDM was applied.

(iii) If requested by the Department, the manufacturer shall conduct simulations to predict the performance of particular basic models of electric motors specified by the Department, analyses of previous simulations conducted by the manufacturer, sample testing of

basic models selected by the Department, or a combination of the foregoing.

(5) *Use of a certification program or accredited laboratory.* (i) A manufacturer may have a certification program, that DOE has classified as nationally recognized under § 431.20, 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 (a)(5)(i) of this section, any testing of the motor pursuant to paragraphs (a)(1) through (3) of this section to determine its energy efficiency must be carried out in accordance with paragraph (b) of this section, in an accredited laboratory that meets the requirements of § 431.18. (This includes testing of the basic model, pursuant to paragraph (a)(3)(i) of this section, to substantiate an AEDM.)

(b) *Additional testing requirements applicable when a certification program is not used*—(1) *Selection of basic models for testing.* (i) Basic models must be selected 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 1997,[1] whichever is later;

(B) The basic models should be of different horsepowers without duplication;

(C) The basic models should be of different frame number series without duplication; and

(D) Each basic model should be expected to have the lowest nominal full load efficiency among the basic models with the same rating ("rating" as used here has the same meaning as it has in the definition of "basic model").

(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.

(2) *Selection of units for testing.* For each basic model selected for testing,[2] a sample of units shall be selected at random and tested. 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 $\bar{X}$ which is defined by

$$\overline{X} = \frac{1}{n}\sum_{i=1}^{n} X_i,$$

where X_i is the measured full-load efficiency of unit i and n is the number of units tested, shall satisfy the condition:

$$\overline{X} \geq \frac{100}{1 + 1.05\left(\frac{100}{RE} - 1\right)}$$

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

$$X_{min} = \min\left(X_i\right)$$

shall satisfy the condition

$$\overline{X}_{min} \geq \frac{100}{1 + 1.15\left(\frac{100}{RE} - 1\right)}$$

(3) *Substantiation of an alternative efficiency determination method.* The basic models tested under § 431.17(a)(3)(i) must be selected for testing in accordance with paragraph (b)(1) of this section, and units of each such basic model must be tested in accordance with paragraph (b)(2) of this section by

[1] In identifying thse five basic models, any electric motor that does not comply with § 431.25 shall be excluded from consideration.

[2] 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.

an accredited laboratory that meets the requirements of § 431.18.

§ 431.18 Testing laboratories.

(a) Testing pursuant to § 431.17(a)(5)(ii) must be conducted in an accredited laboratory for which the accreditation body was:

(1) The National Institute of Standards and Technology/National Voluntary Laboratory Accreditation Program (NIST/NVLAP); or

(2) A laboratory accreditation body having a mutual recognition arrangement with NIST/NVLAP; or

(3) An organization classified by the Department, pursuant to § 431.19, as an accreditation body.

(b) NIST/NVLAP is under the auspices of the National Institute of Standards and Technology (NIST) 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, August 1995, presents the technical requirements of the National Voluntary Laboratory Accreditation Program 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. Changes in NIST/NVLAP's criteria, procedures, policies, standards or other bases for granting accreditation, occurring subsequent to the initial effective date of 10 CFR Part 431, shall not apply to accreditation under this Part unless approved in writing by the Department of Energy. 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, telephone (301) 975–4016, or telefax (301) 926–2884.

§ 431.19 Department of Energy recognition of accreditation bodies.

(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 § 431.21. 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 of electric motor manufacturers, importers, distributors, private labelers or vendors. It cannot be affiliated with, have financial ties with, be controlled by, or be under common control with any such entity.

(3) It must be qualified to perform the accrediting function in a highly competent manner.

(4) It must be expert in the content and application of the test procedures and methodologies in IEEE Standard 112–1996 Test Method B and CSA Standard C390–93 Test Method (1), (Incorporated by reference, see § 431.15) or similar procedures and methodologies for determining the energy efficiency of electric motors.

(c) *Petition format.* Each petition requesting classification as an accreditation body must contain a narrative statement as to why the organization meets the criteria set forth in paragraph (b) of this section, must be signed on behalf of the organization 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 should identify and describe any relationship, direct or indirect, that it has with an electric motor manufacturer, importer, distributor, private labeler, vendor, trade association or other such entity, as well as any other relationship it believes might appear to create a conflict of interest for it in performing as an accreditation body for electric motor testing laboratories. It should explain why it believes such relationship(s) would not compromise its independence as an accreditation body.

(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*, 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.*

(4) *Expertise in electric motor test procedures.* The petition should set forth the organization's experience with the test procedures and methodologies in IEEE Standard 112–1996 Test Method B and CSA Standard C390–93 Test Method (1), (Incorporated by reference, see § 431.15) and with similar procedures and methodologies. This part of the petition should include description of prior projects, qualifications of staff members, and the like. 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,* to energy efficiency testing for electric motors.

(d) *Disposition.* The Department will evaluate the petition in accordance with § 431.21, and will determine whether the applicant meets the criteria in paragraph (b) of this section to be classified as an accrediting body.

§ 431.20 Department of Energy recognition of nationally recognized certification programs.

(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 Section 345(c) of EPCA ("nationally recognized"), the organization operating the program must submit a petition to the Department requesting such classification, in accordance with paragraph (c) of this Section and § 431.21. 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 motor continue to conform to the efficiency levels for which they were certified, and for granting a certificate of conformity.

(2) It must be independent of electric motor manufacturers, importers, distributors, private labelers or vendors. It cannot be affiliated with, have financial ties with, be controlled by, or be under common control with any such entity.

(3) It must be qualified to operate a certification system in a highly competent manner.

(4) It must be expert in the content and application of the test procedures and methodologies in IEEE Standard 112–1996 Test Method B and CSA Standard C390–93 Test Method (1), (Incorporated by reference, see § 431.15) or similar procedures and methodologies for determining the energy efficiency of electric motors. It must have satisfactory criteria and procedures for the selection and sampling of electric motors tested for energy efficiency.

(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 should identify and describe any relationship, direct or indirect, that it or the certification program has with an electric motor manufacturer, importer, distributor, private labeler, vendor, trade association or other such entity, as well as any other relationship it believes might appear to create a conflict of interest for the certification program in operating a certification system for compliance by electric motors with energy efficiency standards. It should explain why it believes such relationship would not compromise its independence in operating a certification program.

(3) *Qualifications to operate a certification system.* Experience in operating a certification system 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 65, *General requirements for bodies operating product certification systems,* 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,* and ISO/IEC Guide 28, *General rules for a model third-party certification system for products,* 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.*

(4) *Expertise in electric motor test procedures.* The petition should set forth the program's experience with the test procedures and methodologies in IEEE Standard 112–1996 Test Method B and CSA Standard C390–93 Test Method (1), (Incorporated by reference, see § 431.15) and with similar procedures and methodologies. This part of the petition should include description of prior projects, qualifications of staff members, and the like. 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,* to energy efficiency testing for electric motors.

(d) *Disposition.* The Department will evaluate the petition in accordance with § 431.21, and will determine whether the applicant meets the criteria in paragraph (b) of this section for classification as a nationally recognized certification program.

§ 431.21 Procedures for recognition and withdrawal of recognition of accreditation bodies and certification programs.

(a) *Filing of petition.* Any petition submitted to the Department pursuant to §§ 431.19(a) or 431.20(a), shall be entitled "Petition for Recognition" ("Petition") and must be submitted, in triplicate to the Assistant Secretary for Energy Efficiency and Renewable Energy, U.S. Department of Energy, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585–0121. 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 a notice 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 the Department believes that an accreditation body or certification program that has been recognized under §§ 431.19 or 431.20, respectively, is failing to meet the criteria of paragraph (b) of the section under which it is recognized, the Department will so advise such entity and request that it take appropriate corrective action. The Department will give the entity an opportunity to respond. 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 a notice of any withdrawal of recognition that occurs pursuant to this paragraph.

ENERGY CONSERVATION STANDARDS

§ 431.25 Energy conservation standards and effective dates.

(a) Each electric motor manufactured (alone or as a component of another piece of equipment) after October 24, 1997, or in the case of an electric motor which requires listing or certification by a nationally recognized safety testing laboratory, after October 24, 1999, shall have a nominal full load efficiency of not less than the following:

Motor horsepower/standard kilowatt equivalent	Nominal full load efficiency					
	Open motors (number of poles)			Enclosed motors (number of poles)		
	6	4	2	6	4	2
1/.75	80.0	82.5	.....	80.0	82.5	75.5
1.5/1.1	84.0	84.0	82.5	85.5	84.0	82.5
2/1.5	85.5	84.0	84.0	86.5	84.0	84.0
3/2.2	86.5	86.5	84.0	87.5	87.5	85.5

Motor horsepower/standard kilowatt equivalent	Nominal full load efficiency					
	Open motors (number of poles)			Enclosed motors (number of poles)		
	6	4	2	6	4	2
5/3.7	87.5	87.5	85.5	87.5	87.5	87.5
7.5/5.5	88.5	88.5	87.5	89.5	89.5	88.5
10/7.5	90.2	89.5	88.5	89.5	89.5	89.5
15/11	90.2	91.0	89.5	90.2	91.0	90.2
20/15	91.0	91.0	90.2	90.2	91.0	90.2
25/18.5	91.7	91.7	91.0	91.7	92.4	91.0
30/22	92.4	92.4	91.0	91.7	92.4	91.0
40/30	93.0	93.0	91.7	93.0	93.0	91.7
50/37	93.0	93.0	92.4	93.0	93.0	92.4
60/45	93.6	93.6	93.0	93.6	93.6	93.0
75/55	93.6	94.1	93.0	93.6	94.1	93.0
100/75	94.1	94.1	93.0	94.1	94.5	93.6
125/90	94.1	94.5	93.6	94.1	94.5	94.5
150/110	94.5	95.0	93.6	95.0	95.0	94.5
200/150	94.5	95.0	94.5	95.0	95.0	95.0

(b) For purposes of determining the required minimum nominal full load efficiency of an electric motor that has a horsepower or kilowatt rating between two horsepowers or kilowattages listed consecutively in paragraph (a) of this section, each such motor shall be deemed to have a horsepower or kilowatt rating that is listed in paragraph (a) of this section. The rating that the motor is deemed to have shall be determined as follows:

(1) A horsepower at or above the midpoint between the two consecutive horsepowers shall be rounded up to the higher of the two horsepowers;

(2) A horsepower below the midpoint between the two consecutive horsepowers shall be rounded down to the lower of the two horsepowers, or

(3) A kilowatt rating shall be directly converted from kilowatts to horsepower using the formula, 1 kilowatt = (1/0.746) horsepower, without calculating beyond three significant decimal places, and the resulting horsepower shall be rounded in accordance with paragraphs (b)(1) or (b)(2) of this section, whichever applies.

(c) Each general purpose electric motor (subtype I), except as provided in paragraph (d) of this section, with a power rating of 1 horsepower or greater, but not greater than 200 horsepower, manufactured (alone or as a component of another piece of equipment) on or after December 19, 2010, shall have a nominal full load efficiency that is not less than the following:

FULL-LOAD EFFICIENCIES OF GENERAL PURPOSE ELECTRIC MOTORS

[Subtype I]

Motor horsepower	Nominal full load efficiency					
	Open motors (number of poles)			Enclosed motors (number of poles)		
	6	4	2	6	4	2
1	82.5	85.5	77.0	82.5	85.5	77.0
1.5	86.5	86.5	84.0	87.5	86.5	84.0
2	87.5	86.5	85.5	88.5	86.5	85.5
3	88.5	89.5	85.5	89.5	89.5	86.5
5	89.5	89.5	86.5	89.5	89.5	88.5
7.5	90.2	91.0	88.5	91.0	91.7	89.5
10	91.7	91.7	89.5	91.0	91.7	90.2
15	91.7	93.0	90.2	91.7	92.4	91.0
20	92.4	93.0	91.0	91.7	93.0	91.0
25	93.0	93.6	91.7	93.0	93.6	91.7
30	93.6	94.1	91.7	93.0	93.6	91.7
40	94.1	94.1	92.4	94.1	94.1	92.4
50	94.1	94.5	93.0	94.1	94.5	93.0
60	94.5	95.0	93.6	94.5	95.0	93.6
75	94.5	95.0	93.6	94.5	95.4	93.6
100	95.0	95.4	93.6	95.0	95.4	94.1

FULL-LOAD EFFICIENCIES OF GENERAL PURPOSE ELECTRIC MOTORS—Continued

[Subtype I]

Motor horsepower	Nominal full load efficiency					
	Open motors (number of poles)			Enclosed motors (number of poles)		
	6	4	2	6	4	2
125	95.0	95.4	94.1	95.0	95.4	95.0
150	95.4	95.8	94.1	95.8	95.8	95.0
200	95.4	95.8	95.0	95.8	96.2	95.4

(d) Each fire pump motor manufactured (alone or as a component of another piece of equipment) on or after December 19, 2010, shall have a nominal full load efficiency that is not less than the following:

FULL-LOAD EFFICIENCIES OF FIRE PUMP MOTORS

Motor horsepower	Nominal full load efficiency							
	Open motors (number of poles)				Enclosed motors (number of poles)			
	8	6	4	2	8	6	4	2
1	74.0	80.0	82.5		74.0	80.0	82.5	75.5
1.5	75.5	84.0	84.0	82.5	77.0	85.5	84.0	82.5
2	85.5	85.5	84.0	84.0	82.5	86.5	84.0	84.0
3	86.5	86.5	86.5	84.0	84.0	87.5	87.5	85.5
5	87.5	87.5	87.5	85.5	85.5	87.5	87.5	87.5
7.5	88.5	88.5	88.5	87.5	85.5	89.5	89.5	88.5
10	89.5	90.2	89.5	88.5	88.5	89.5	89.5	89.5
15	89.5	90.2	91.0	89.5	88.5	90.2	91.0	90.2
20	90.2	91.0	91.0	90.2	89.5	90.2	91.0	90.2
25	90.2	91.7	91.7	91.0	89.5	91.7	92.4	91.0
30	91.0	92.4	92.4	91.0	91.0	91.7	92.4	91.0
40	91.0	93.0	93.0	91.7	91.0	93.0	93.0	91.7
50	91.7	93.0	93.0	92.4	91.7	93.0	93.0	92.4
60	92.4	93.6	93.6	93.0	91.7	93.6	93.6	93.0
75	93.6	93.6	94.1	93.0	93.0	93.6	94.1	93.0
100	93.6	94.1	94.1	93.0	93.0	94.1	94.5	93.6
125	93.6	94.1	94.5	93.6	93.6	94.1	94.5	94.5
150	93.6	94.5	95.0	93.6	93.6	95.0	95.0	94.5
200	93.6	94.5	95.0	94.5	94.1	95.0	95.0	95.0
250	94.5	95.4	95.4	94.5	94.5	95.0	95.0	95.4
300		95.4	95.4	95.0		95.0	95.4	95.4
350		95.4	95.4	95.0		95.0	95.4	95.4
400			95.4	95.4			95.4	95.4
450			95.8	95.8			95.4	95.4
500			95.8	95.8			95.8	95.4

(e) Each general purpose electric motor (subtype II) with a power rating of 1 horsepower or greater, but not greater than 200 horsepower, manufactured (alone or as a component of another piece of equipment) on or after December 19, 2010, shall have a nominal full load efficiency that is not less than the following:

FULL-LOAD EFFICIENCIES OF GENERAL PURPOSE ELECTRIC MOTORS

[Subtype II]

Motor horsepower	Nominal full load efficiency							
	Open motors (number of poles)				Enclosed motors (number of poles)			
	8	6	4	2	8	6	4	2
1	74.0	80.0	82.5		74.0	80.0	82.5	75.5

FULL-LOAD EFFICIENCIES OF GENERAL PURPOSE ELECTRIC MOTORS—Continued

[Subtype II]

Motor horsepower	Nominal full load efficiency							
	Open motors (number of poles)				Enclosed motors (number of poles)			
	8	6	4	2	8	6	4	2
1.5	75.5	84.0	84.0	82.5	77.0	85.5	84.0	82.5
2	85.5	85.5	84.0	84.0	82.5	86.5	84.0	84.0
3	86.5	86.5	86.5	84.0	84.0	87.5	87.5	85.5
5	87.5	87.5	87.5	85.5	85.5	87.5	87.5	87.5
7.5	88.5	88.5	88.5	87.5	85.5	89.5	89.5	88.5
10	89.5	90.2	89.5	88.5	88.5	89.5	89.5	89.5
15	89.5	90.2	91.0	89.5	88.5	90.2	91.0	90.2
20	90.2	91.0	91.0	90.2	89.5	90.2	91.0	90.2
25	90.2	91.7	91.7	91.0	89.5	91.7	92.4	91.0
30	91.0	92.4	92.4	91.0	91.0	91.7	92.4	91.0
40	91.0	93.0	93.0	91.7	91.0	93.0	93.0	91.7
50	91.7	93.0	93.0	92.4	91.7	93.0	93.0	92.4
60	92.4	93.6	93.6	93.0	91.7	93.6	93.6	93.0
75	93.6	93.6	94.1	93.0	93.0	93.6	94.1	93.0
100	93.6	94.1	94.1	93.0	93.0	94.1	94.5	93.6
125	93.6	94.1	94.5	93.6	93.6	94.1	94.5	94.5
150	93.6	94.5	95.0	93.6	93.6	95.0	95.0	94.5
200	93.6	94.5	95.0	94.5	94.1	95.0	95.0	95.0

(f) Each NEMA Design B general purpose electric motor with a power rating of more than 200 horsepower, but not greater than 500 horsepower, manufactured (alone or as a component of another piece of equipment), on or after December 19, 2010, shall have a nominal full load efficiency that is not less than the following:

FULL-LOAD EFFICIENCIES OF NEMA DESIGN B GENERAL PURPOSE ELECTRIC MOTORS

Motor horsepower	Nominal full load efficiency							
	Open motors (number of poles)				Enclosed motors (number of poles)			
	8	6	4	2	8	6	4	2
250	94.5	95.4	95.4	94.5	94.5	95.0	95.0	95.4
300	.....	95.4	95.4	95.0	.....	95.0	95.4	95.4
350	.....	95.4	95.4	95.0	.....	95.0	95.4	95.4
400	.....	.....	95.4	95.4	.....	.....	95.4	95.4
450	.....	.....	95.8	95.8	.....	.....	95.4	95.4
500	.....	.....	95.8	95.8	.....	.....	95.8	95.4

(g) This section does not apply to definite purpose motors, special purpose motors, and those motors exempted by the Secretary.

[69 FR 61923, Oct. 21, 2004, as amended at 74 FR 12071, Mar. 23, 2009; 75 FR 80292, Dec. 22, 2010]

§ 431.26 Preemption of State regulations.

Any State regulation providing for any energy conservation standard, or other requirement with respect to the energy efficiency or energy use, of an electric motor that is not identical to a Federal standard in effect under this subpart is preempted by that standard, except as provided for in Section 345(a) and 327(b) and (c) of the Act.

LABELING

§ 431.30 Applicability of labeling requirements.

The labeling rules in § 431.31, established pursuant to Section 344 of EPCA, 42 U.S.C. 6315, apply only to electric motors manufactured after October 5, 2000.

§ 431.31 Labeling requirements.

(a) *Electric motor nameplate*—(1) *Required information.* The permanent nameplate of an electric motor for which standards are prescribed in § 431.25 must be marked clearly with the following information:

(i) The motor's nominal full load efficiency (as of the date of manufacture), derived from the motor's average full load efficiency as determined pursuant to this subpart; and

(ii) A Compliance Certification number ("CC number") supplied by DOE to the manufacturer or private labeler, pursuant to § 431.36(f), and applicable to that motor. Such CC number must be on the nameplate of a motor beginning 90 days after either:

(A) The manufacturer or private labeler has received the number upon submitting a Compliance Certification covering that motor, or

(B) The expiration of 21 days from DOE's receipt of a Compliance Certification covering that motor, if the manufacturer or private labeler has not been advised by DOE that the Compliance Certification fails to satisfy § 431.36.

(2) *Display of required information.* All orientation, spacing, type sizes, type faces, and line widths to display this required information shall be the same as or similar to the display of the other performance data on the motor's permanent nameplate. The nominal full load efficiency shall be identified either by the term "Nominal Efficiency" or "Nom. Eff." or by the terms specified in paragraph 12.58.2 of NEMA MG1–1993, (Incorporated by reference, see § 431.15) as for example "NEMA Nom. Eff. _____." The DOE number shall be in the form "CC_____.

(3) *Optional display.* The permanent nameplate of an electric motor, a separate plate, or decalcomania, may be marked with the encircled lower case letters "ee", for example,

or with some comparable designation or logo, if the motor meets the applicable standard prescribed in § 431.25, as determined pursuant to this subpart, and is covered by a Compliance Certification that satisfies § 431.36.

(b) *Disclosure of efficiency information in marketing materials.* (1) The same information that must appear on an electric motor's permanent nameplate pursuant to paragraph (a)(1) of this section, shall be prominently displayed:

(i) On each page of a catalog that lists the motor; and

(ii) In other materials used to market the motor.

(2) The "ee" logo, or other similar logo or designations, may also be used in catalogs and other materials to the same extent they may be used on labels under paragraph (a)(3) of this section.

§ 431.32 Preemption of State regulations.

The provisions of § 431.31 supersede any State regulation to the extent required by Section 327 of the Act. Pursuant to the Act, all State regulations that require the disclosure for any electric motor of information with respect to energy consumption, other than the information required to be disclosed in accordance with this part, are superseded.

CERTIFICATION

§ 431.35 Applicability of certification requirements.

Section 431.36 sets forth the procedures for manufacturers to certify that electric motors comply with the applicable energy efficiency standards set forth in this subpart.

§ 431.36 Compliance Certification.

(a) *General.* Beginning April 26, 2003, a manufacturer or private labeler shall not distribute in commerce any basic model of an electric motor which is subject to an energy efficiency standard set forth in this subpart unless it has submitted to the Department a Compliance Certification certifying, in accordance with the provisions of this section, that the basic model meets the requirements of the applicable standard. The representations in the Compliance Certification must be based upon the basic model's energy efficiency as determined in accordance with the applicable requirements of this subpart. This means, in part, that either:

(1) The representations as to the basic model must be based on use of a certification organization; or

(2) Any testing of the basic model on which the representations are based must be conducted at an accredited laboratory.

(b) *Required contents*—(1) *General representations.* Each Compliance Certification must certify that:

(i) The nominal full load efficiency for each basic model of electric motor distributed is not less than the minimum nominal full load efficiency required for that motor by § 431.25;

(ii) All required determinations on which the Compliance Certification is based were made in compliance with the applicable requirements prescribed in this subpart;

(iii) All information reported in the Compliance Certification is true, accurate, and complete; and

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

(2) *Specific data.* (i) For each rating of electric motor (as the term "rating" is defined in the definition of basic model) which a manufacturer or private labeler distributes, the Compliance Certification must report the nominal full load efficiency, determined pursuant to §§ 431.16 and 431.17, of the least efficient basic model within that rating.

(ii) The Compliance Certification must identify the basic models on which actual testing has been performed to meet the requirements of § 431.17.

(iii) The format for a Compliance Certification is set forth in appendix C of this subpart.

(c) *Optional contents.* In any Compliance Certification, a manufacturer or private labeler may at its option request that DOE provide it with a unique Compliance Certification number ("CC number") for any brand name, trademark or other label name under which the manufacturer or private labeler distributes electric motors covered by the Certification. Such a Compliance Certification must also identify all other names, if any, under which the manufacturer or private labeler distributes electric motors, and to which the request does not apply.

(d) *Signature and submission.* A manufacturer or private labeler must submit the Compliance Certification either on its own behalf, signed by a corporate officer of the company, or through a third party (for example, a trade association or other authorized representative) acting on its behalf. Where a third party is used, the Compliance Certification must identify the official of the manufacturer or private labeler who authorized the third party to make representations on the company's behalf, and must be signed by a corporate official of the third party. The Compliance Certification must be submitted to the Department by certified mail, to Department of Energy, Assistant Secretary for Energy Efficiency and Renewable Energy, Building Technologies (EE–2J), Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585–0121.

(e) *New basic models.* For electric motors, a Compliance Certification must be submitted for a new basic model only if the manufacturer or private labeler has not previously submitted to DOE a Compliance Certification, that meets the requirements of this section, for a basic model that has the same rating as the new basic model, and that has a lower nominal full load efficiency than the new basic model.

(f) *Response to Compliance Certification; Compliance Certification Number (CC number)*—(1) DOE processing of Certification. Promptly upon receipt of a Compliance Certification, the Department will determine whether the document contains all of the elements required by this section, and may, in its discretion, determine whether all or part of the information provided in the document is accurate. The Department will then advise the submitting party in writing either that the Compliance Certification does not satisfy the requirements of this section, in which case the document will be returned, or that the Compliance Certification satisfies this section. The Department will also advise the submitting party of the basis for its determination.

(2) *Issuance of CC number(s).* (i) Initial Compliance Certification. When DOE advises that the initial Compliance Certification submitted by or on behalf of a manufacturer or private labeler is acceptable, either:

(A) DOE will provide a single unique CC number, "CC_____," to the manufacturer or private labeler, and such CC number shall be applicable to all electric motors distributed by the manufacturer or private labeler, or

(B) When required by paragraph (f)(3) of this section, DOE will provide more than one CC number to the manufacturer or private labeler.

(ii) Subsequent Compliance Certification. When DOE advises that any other Compliance Certification is acceptable, it will provide a unique CC number for any brand name, trademark or other name when required by paragraph (f)(3) of this section.

(iii) When DOE declines to provide a CC number as requested by a manufacturer or private labeler in accordance with §431.36(c), DOE will advise the requester of the reasons for such refusal.

(3) *Issuance of two or more CC numbers.* (i) DOE will provide a unique CC number for each brand name, trademark or other label name for which a manufacturer or private labeler requests such a number in accordance with §431.36(c), except as follows. DOE will not provide a CC number for any brand name, trademark or other label name

(A) For which DOE has previously provided a CC number, or

(B) That duplicates or overlaps with other names under which the manufacturer or private labeler sells electric motors.

(ii) Once DOE has provided a CC number for a particular name, that shall be the only CC number applicable to all electric motors distributed by the manufacturer or private labeler under that name.

(iii) If the Compliance Certification in which a manufacturer or private labeler requests a CC number is the initial Compliance Certification submitted by it or on its behalf, and it distributes electric motors not covered by the CC number(s) DOE provides in response to the request(s), DOE will also provide a unique CC number that shall be applicable to all of these other motors.

APPENDIX A TO SUBPART B OF PART 431—POLICY STATEMENT FOR ELECTRIC MOTORS COVERED UNDER THE ENERGY POLICY AND CONSERVATION ACT

This is a reprint of a policy statement which was published on November 5, 1997 at 62 FR 59978.

Policy Statement for Electric Motors Covered Under the Energy Policy and Conservation Act

I. INTRODUCTION

The Energy Policy and Conservation Act (EPCA), 42 U.S.C. 6311, *et seq.*, establishes energy efficiency standards and test procedures for certain commercial and industrial electric motors manufactured (alone or as a component of another piece of equipment) after October 24, 1997, or, in the case of an electric motor which requires listing or certification by a nationally recognized safety testing laboratory, after October 24, 1999.[1] EPCA also directs the Department of Energy (DOE or Department) to implement the statutory test procedures prescribed for motors, and to require efficiency labeling of motors and certification that covered motors comply with the standards.

Section 340(13)(A) of EPCA defines the term "electric motor" based essentially on the construction and rating system in the National Electrical Manufacturers Association (NEMA) Standards Publication MG1. Sections 340(13)(B) and (c) of EPCA define the terms "definite purpose motor" and "special purpose motor," respectively, for which the statute prescribes no efficiency standards.

In its proposed rule to implement the EPCA provisions that apply to motors (61 FR 60440, November 27, 1996), DOE has proposed to clarify the statutory definition of "electric motor," to mean a machine which converts electrical power into rotational mechanical power and which: (1) Is a general purpose motor, including motors with explosion-proof construction[2]; (2) is a single

[1] The term "manufacture" means "to manufacture, produce, assemble or import." EPCA §321(10). Thus, the standards apply to motors produced, assembled, imported or manufactured after these statutory deadlines.

[2] Section 342(b)(1) of EPCA recognizes that EPCA's efficiency standards cover "motors which require listing or certification by a nationally recognized safety testing laboratory." This applies, for example, to explosion-proof motors which are otherwise general purpose motors.

speed, induction motor; (3) is rated for continuous duty operation, or is rated duty type S–1 (IEC)[3]; (4) contains a squirrel-cage or cage (IEC) rotor; (5) has foot-mounting, including foot-mounting with flanges or detachable feet; (6) is built in accordance with NEMA T-frame dimensions, or IEC metric equivalents (IEC); (7) has performance in accordance with NEMA Design A or B characteristics, or equivalent designs such as IEC Design N (IEC); and (8) operates on polyphase alternating current 60-Hertz sinusoidal power, and is (i) rated 230 volts or 460 volts, or both, including any motor that is rated at multi-voltages that include 230 volts or 460 volts, or (ii) can be operated on 230 volts or 460 volts, or both.

Notwithstanding the clarification provided in the proposed rule, there still appears to be uncertainty as to which motors EPCA covers. It is widely understood that the statute covers "general purpose" motors that are manufactured for a variety of applications, and that meet EPCA's definition of "electric motor." Many modifications, however, can be made to such generic motors. Motor manufacturers have expressed concern as to precisely which motors with such modifications are covered under the statute, and as to whether manufacturers will be able to comply with the statute by October 25, 1997 with respect to all of these covered motors. Consequently, motor manufacturers have requested that the Department provide additional guidance as to which types of motors are "electric motors," "definite purpose motors," and "special purpose motors" under EPCA. The policy statement that follows is based upon input from motor manufacturers and energy efficiency advocates, and provides such guidance.

II. Guidelines for Determining Whether a Motor Is Covered by EPCA

A. General

EPCA specifies minimum nominal full-load energy efficiency standards for 1 to 200 horsepower electric motors, and, to measure compliance with those standards, prescribes use of the test procedures in NEMA Standard MG1 and Institute of Electrical and Electronics Engineers, Inc., (IEEE) Standard 112. In DOE's view, as stated in Assistant Secretary Ervin's letter of May 9, 1996, to NEMA's Malcolm O'Hagan, until DOE's regulations become effective, manufacturers can establish compliance with these EPCA requirements through use of competent and reliable procedures or methods that give reasonable assurance of such compliance. So long as these criteria are met, manufacturers may conduct required testing in their own laboratories or in independent laboratories, and may employ alternative correlation methods (in lieu of actual testing) for some motors. Manufacturers may also establish their compliance with EPCA standards and test procedures through use of third party certification or verification programs such as those recognized by Natural Resources Canada. Labeling and certification requirements will become effective only after DOE has promulgated a final rule prescribing such requirements.

Motors with features or characteristics that do not meet the statutory definition of "electric motor" are not covered, and therefore are not required to meet EPCA requirements. Examples include motors without feet and without provisions for feet, and variable speed motors operated on a variable frequency power supply. Similarly, multi speed motors and variable speed motors, such as inverter duty motors, are not covered equipment, based on their intrinsic design for use at variable speeds. However, NEMA Design A or B motors that are single speed, meet all other criteria under the definitions in EPCA for covered equipment, and can be used with an inverter in variable speed applications as an additional feature, are covered equipment under EPCA. In other words, being suitable for use on an inverter by itself does not exempt a motor from EPCA requirements.

Section 340(13)(F) of EPCA, defines a "small electric motor" as "a NEMA general purpose alternating current single-speed induction motor, built in a two-digit frame number series in accordance with NEMA Standards Publication MG 1–1987." Section 346 of EPCA requires DOE to prescribe testing requirements and efficiency standards only for those small electric motors for which the Secretary determines that standards are warranted. The Department has not yet made such a determination.

B. Electrical Features

As noted above, the Department's proposed definition of "electric motor" provides in part that it is a motor that "operates on polyphase alternating current 60-Hertz sinusoidal power, and * * * can be operated on 230 volts or 460 volts, or both." In DOE's view, "can be operated" implicitly means that the motor can be operated successfully. According to NEMA Standards Publication MG1–1993, paragraph 12.44, "Variations from Rated

[3] Terms followed by the parenthetical "IEC" are referred to in the International Electrotechnical Commission (IEC) Standard 34–1. Such terms are included in DOE's proposed definition of "electric motor" because DOE believes EPCA's efficiency requirements apply to metric system motors that conform to IEC Standard 34, and that are identical or equivalent to motors constructed in accordance with NEMA MG1 and covered by the statute.

Voltage and Rated Frequency," alternating-current motors must operate successfully under running conditions at rated load with a variation in the voltage or the frequency up to the following: Plus or minus 10 percent of rated voltage, with rated frequency for induction motors;[4] plus or minus 5 percent of rated frequency, with rated voltage; and a combined variation in voltage and frequency of 10 percent (sum of absolute values) of the rated values, provided the frequency variation does not exceed plus or minus 5 percent of rated frequency. DOE believes that, for purposes of determining whether a motor meets EPCA's definition of "electric motor," these criteria should be used to determine when a motor that is not rated at 230 or 460 volts or 60 Hertz can be operated at such voltage and frequency.[5]

NEMA Standards Publication MG1 categorizes electrical modifications to motors according to performance characteristics that include locked rotor torque, breakdown torque, pull-up torque, locked rotor current, and slip at rated load, and assigns design letters, such as Design A, B, C, D, or E, to identify various combinations of such electrical performance characteristics. Under Section 340(13)(A) of EPCA, electric motors subject to EPCA efficiency requirements include only motors that fall within NEMA "Design A and B * * * as defined in [NEMA] Standards Publication MG1–1987." As to locked rotor torque, for example, MG1 specifies a minimum performance value for a Design A or B motor of a given speed and horsepower, and somewhat higher minimum values for Design C and D motors of the same speed and horsepower. The Department understands that, under MG1, the industry classifies a motor as Design A or B if it has a locked rotor torque at or above the minimum for A and B but below the minimum for Design C, so long as it otherwise meets the criteria for Design A or B. Therefore, in the Department's view, such a motor is covered by EPCA's requirements for electric motors. By contrast a motor that meets or exceeds the minimum locked rotor torque for Design C or D is not covered by EPCA. In sum, if a motor has electrical modifications that meet Design A or B performance requirements it is covered by EPCA, and if its characteristics meet Design C, D or E it is not covered.

C. Size

Motors designed for use on a particular type of application which are in a frame size that is one or more frame *series* larger than the frame size assigned to that rating by sections 1.2 and 1.3 of NEMA Standards Publication MG 13–1984 (R1990), "Frame Assignments for Alternating Current Integral-Horsepower Induction Motors," are not, in the Department's view, usable in most general purpose applications. This is due to the physical size increase associated with a frame series change. A frame series is defined as the first two digits of the frame size designation. For example, 324T and 326T are both in the same frame series, while 364T is in the next larger frame series. Hence, in the Department's view, a motor that is of a larger frame series than normally assigned to that standard rating of motor is not covered by EPCA. A physically larger motor within the same frame series would be covered, however, because it would be usable in most general purpose applications.

Motors built in a T-frame series or a T-frame size smaller than that assigned by MG 13–1984 (R1990) are also considered usable in most general purpose applications. This is because simple modifications can generally be made to fit a smaller motor in place of a motor with a larger frame size assigned in conformity with NEMA MG 13. Therefore, DOE believes that such smaller motors are covered by EPCA.

D. Motors With Seals

Some electric motors have seals to prevent ingress of water, dust, oil, and other foreign materials into the motor. DOE understands that, typically, a manufacturer will add seals to a motor that it manufactures, so that it will sell two motors that are identical except that one has seals and the other does not. In such a situation, if the motor without seals is "general purpose" and covered by EPCA's efficiency requirements, then the motor with seals will also be covered because it can still be used in most general purpose applications. DOE understands, however, that manufacturers previously believed motors with seals were not covered

[4] For example, a motor that is rated at 220 volts should operate successfully on 230 volts, since 220 + .10(220) = 242 volts. A 208 volt motor, however, would not be expected to operate successfully on 230 volts, since 208 + .10(208) = 228.8 volts.

[5] The Department understands that a motor that can operate at such voltage and frequency, based on variations defined for successful operation, will not necessarily perform in accordance with the industry standards established for operation at the motor's rated voltage and frequency. In addition, under the test procedures prescribed by EPCA, motors are to be tested at their rated values. Therefore, in DOE's view a motor that is not rated for 230 or 460 volts, or 60 Hertz, but that can be successfully operated at these levels, must meet the energy efficiency requirements at its rated voltage(s) and frequency. DOE also notes that when a motor is rated to include a wider voltage range that includes 230/460 volts, the motor should meet the energy efficiency requirements at 230 volts or 460 volts.

under EPCA, in part because IEEE Standard 112, "Test Procedure for Polyphase Induction Motors and Generators," prescribed by EPCA, does not address how to test a motor with seals installed.

The efficiency rating of such a motor, if determined with seals installed and when the motor is new, apparently would significantly understate the efficiency of the motor as operated. New seals are stiff, and provide friction that is absent after their initial break-in period. DOE understands that, after this initial period, the efficiency ratings determined for the same motor with and without seals would be virtually identical. To construe EPCA, therefore, as requiring such separate efficiency determinations would impose an unnecessary burden on manufacturers.

In light of the foregoing, the Department believes that EPCA generally permits the efficiency of a motor with seals to be determined without the seals installed. Furthermore, notwithstanding the prior belief that such motors are not covered by EPCA, use of this approach to determining efficiency will enable manufacturers to meet EPCA's standards with respect to covered motors with seals by the date the standards go into effect on October 25, 1997.

III. Discussion of How DOE Would Apply EPCA Definitions, Using the Foregoing Guidelines

Using the foregoing guidelines, the attached matrix provides DOE's view as to which motors with common features are covered by EPCA. Because manufacturers produce many basic models that have many modifications of generic general purpose motors, the Department does not represent that the matrix is all-inclusive. Rather it is a set of examples demonstrating how DOE would apply EPCA definitions, as construed by the above guidelines, to various motor types. By extension of these examples, most motors currently in production, or to be designed in the future, could probably be classified. The matrix classifies motors into five categories, which are discussed in the following passages.

Category I—For "electric motors" (manufactured alone or as a component of another piece of equipment) in Category I, DOE will enforce EPCA efficiency standards and test procedures beginning on October 25, 1997.

The Department understands that some motors essentially are relatively simple modifications of generic general purpose motors. Modifications could consist, for example, of minor changes such as the addition of temperature sensors or a heater, the addition of a shaft extension and a brake disk from a kit, or changes in exterior features such as the motor housing. Such motors can still be used for most general purpose applications, and the modifications have little or no effect on motor performance. Nor do the modifications affect energy efficiency.

Category II—For certain motors that are "definite purpose" according to present industry practice, but that can be used in most general purpose applications, DOE will generally enforce EPCA efficiency standards and test procedures beginning no later than October 25, 1999.

General Statement

EPCA does not prescribe standards and test procedures for "definite purpose motors." Section 340(13)(B) of EPCA defines the term "definite purpose motor" as "any motor designed in standard ratings with standard operating characteristics or standard mechanical construction for use under service conditions other than usual or for use on a particular type of application *and which cannot be used in most general purpose applications*." [Emphasis added.] Except, significantly, for exclusion of the italicized language, the industry definition of "definite purpose motor," set forth in NEMA MG1, is identical to the foregoing.

Category II consists of electric motors with horsepower ratings that fall between the horsepower ratings in Section 342(b)(1) of EPCA, thermally protected motors, and motors with roller bearings. As with motors in Category I, these motors are essentially modifications of generic general purpose motors. Generally, however, the modifications contained in these motors are more extensive and complex than the modifications in Category I motors. These Category II motors have been considered "definite purpose" in common industry parlance, but are covered equipment under EPCA because they can be used in most general purpose applications.

According to statements provided during the January 15, 1997, Public Hearing, Tr. pgs. 238–239, Category II motors were, until recently, viewed by most manufacturers as definite purpose motors, consistent with the industry definition that did not contain the clause "which cannot be used in most general purpose applications." Hence, DOE understands that many manufacturers assumed these motors were not subject to EPCA's efficiency standards. During the period prior and subsequent to the hearing, discussions among manufacturers resulted in a new understanding that such motors are general purpose under EPCA, since they *can* be used in most general purpose applications. Thus, the industry only recently recognized that such motors are covered under EPCA. Although the statutory definition adopted in 1992 contained the above-quoted definition of "definite purpose," the delay in issuing regulations which embody this definition may have contributed to industry's delay in recognizing that these motors are covered.

The Department understands that redesign and testing these motors in order to meet

the efficiency standards in the statute may require a substantial amount of time. Given the recent recognition that they are covered, it is not realistic to expect these motors will be able to comply by October 25, 1997. A substantial period beyond that will be required. Moreover, the Department believes different manufacturers will need to take different approaches to achieving compliance with respect to these motors, and that, for a particular type of motor, some manufacturers will be able to comply sooner than others. Thus, the Department intends to refrain from taking enforcement action for two years, until October 25, 1999, with respect to motors with horsepower ratings that fall between the horsepower ratings in Section 342(b)(1) of EPCA, thermally protected motors, and motors with roller bearings. Manufacturers are encouraged, however, to manufacture these motors in compliance with EPCA at the earliest possible date.

The following sets forth in greater detail, for each of these types of motors, the basis for the Department's policy to refrain from enforcement for two years. Also set forth is additional explanation of the Department's understanding as to why manufacturers previously believed intermediate horsepower motors were not covered by EPCA.

Intermediate Horsepower Ratings

Section 342(b)(1) of EPCA specifies efficiency standards for electric motors with 19 specific horsepower ratings, ranging from one through 200 horsepower. Each is a preferred or standardized horsepower rating as reflected in the table in NEMA Standards Publication MG1–1993, paragraph 10.32.4, *Polyphase Medium Induction Motors*. However, an "electric motor," as defined by EPCA, can be built at other horsepower ratings, such as 6 horsepower, 65 horsepower, or 175 horsepower. Such motors, rated at horsepower levels between any two adjacent horsepower ratings identified in Section 342(b)(1) of EPCA will be referred to as "intermediate horsepower motors." In the Department's view, efficiency standards apply to every motor that has a rating from one through 200 horsepower (or kilowatt equivalents), and that otherwise meets the criteria for an "electric motor" under EPCA, including an electric motor with an intermediate horsepower (or kW) rating.

To date, these motors have typically been designed in conjunction with and supplied to a specific customer to fulfill certain performance and design requirements of a particular application, as for example to run a certain type of equipment. See the discussion in Section IV below on "original equipment" and "original equipment manufacturers." In large part for these reasons, manufacturers believed intermediate horsepower motors to be "definite purpose motors" that were not covered by EPCA. Despite their specific uses, however, these motors are electric motors under EPCA when they are capable of being used in most general purpose applications.

Features of a motor that are directly related to its horsepower rating include its physical size, and the ratings of its controller and protective devices. These aspects of a 175 horsepower motor, for example, which is an intermediate horsepower motor, must be appropriate to that horsepower, and would generally differ from the same aspects of 150 and 200 horsepower motors, the two standard horsepower ratings closest to 175. To re-design an existing intermediate horsepower electric motor so that it complies with EPCA could involve all of these elements of a motor's design. For example, the addition of material necessary to achieve EPCA's prescribed level of efficiency could cause the size of the motor to increase. The addition of magnetic material would invite higher inrush current that could cause an incorrectly sized motor controller to malfunction, or the circuit breaker with a standard rating to trip unnecessarily, or both. The Department believes motor manufacturers will require a substantial amount of time to redesign and retest each intermediate horsepower electric motor they manufacture.

To the extent such intermediate horsepower electric motors become unavailable because motor manufacturers have recognized only recently that they are covered by EPCA, equipment in which they are incorporated would temporarily become unavailable also. Moreover, re-design of such a motor to comply with EPCA could cause changes in the motor that require re-design of the equipment in which the motor is used. For example, if an intermediate horsepower electric motor becomes larger, it might no longer fit in the equipment for which it was designed. In such instances, the equipment would have to be re-designed. Because these motors were previously thought not to be covered, equipment manufacturers may not have had sufficient lead time to make the necessary changes to the equipment without interrupting its production.

With respect to intermediate horsepower motors, the Department intends to refrain from enforcing EPCA for a period of 24 months only as to such motor designs that were being manufactured prior to the date this Policy Statement was issued. The Department is concerned that small adjustments could be made to the horsepower rating of an existing electric motor, in an effort to delay compliance with EPCA, if it delayed enforcement as to all intermediate horsepower motors produced during the 24 month period. For example, a 50 horsepower motor that has a service factor of 1.15 could be renameplated as a 57½ horsepower motor that has a 1.0 service factor. By making this

delay in enforcement applicable only to pre-existing designs of intermediate horsepower motors, the Department believes it has made adequate provision for the manufacture of bona fide intermediate horsepower motor designs that cannot be changed to be in compliance with EPCA by October 25, 1997.

Thermally Protected Motors

The Department understands that in order to redesign a thermally protected motor to improve its efficiency so that it complies with EPCA, various changes in the windings must be made which will require the thermal protector to be re-selected. Such devices sense the inrush and running current of the motor, as well as the operating temperature. Any changes to a motor that affect these characteristics will prevent the protector from operating correctly. When a new protector is selected, the motor must be tested to verify proper operation of the device in the motor. The motor manufacturer would test the locked rotor and overload conditions, which could take several days, and the results may dictate that a second selection is needed with additional testing. When the manufacturer has finished testing, typically the manufacturer will have a third party conduct additional testing. This testing may include cycling the motor in a locked-rotor condition to verify that the protector functions properly. This testing may take days or even weeks to perform for a particular model of motor.

Since it was only recently recognized by industry that these motors are covered by EPCA, in the Department's view the total testing program makes it impossible for manufacturers to comply with the EPCA efficiency levels in thermally protected motors by October 25, 1997, especially since each different motor winding must be tested and motor winding/thermal protector combinations number in the thousands.

Motors With Roller Bearings

Motors with roller bearings fit within the definition of electric motor under the statute. However, because the IEEE Standard 112 Test Method B does not provide measures to test motors with roller bearings installed, manufacturers mistakenly believed such motors were not covered. Under IEEE Standard 112, a motor with roller bearings could only be tested for efficiency with the roller bearings removed and standard ball bearings installed as temporary substitutes. Then on the basis of the energy efficiency information gained from that test, the manufacturer may need to redesign the motor in order to comply with the statute. In this situation, the Department understands that testing, redesigning, and retesting lines of motors with roller bearings, to establish compliance, would be difficult and time consuming.

Categories III, IV and V—Motors not within EPCA's definition of "electric motor," and not covered by EPCA.

Close-Coupled Pump Motors

NEMA Standards Publication MG1–1993, with revisions one through three, Part 18, "Definite-Purpose Machines," defines "a face-mounting close-coupled pump motor" as "a medium alternating-current squirrel-cage induction open or totally enclosed motor, with or without feet, having a shaft suitable for mounting an impeller and sealing device." Paragraphs MG1–18.601–18.614 specify its performance, face and shaft mounting dimensions, and frame assignments that replace the suffix letters T and TS with the suffix letters JM and JP.

The Department understands that such motors are designed in standard ratings with standard operating characteristics for use in certain close-coupled pumps and pumping applications, but cannot be used in non-pumping applications, such as, for example, conveyors. Consequently, the Department believes close-coupled pump motors are definite-purpose motors not covered by EPCA. However, a motor that meets EPCA's definition of "electric motor," and which can be coupled to a pump, for example by means of a C-face or D-flange end shield, as depicted in NEMA Standards Publication MG1, Part 4, "Dimensions, Tolerances, and Mounting," is covered.

Totally-Enclosed Non-Ventilated (TENV) and Totally-Enclosed Air-Over (TEAO) Motors

A motor designated in NEMA MG1–1993, paragraph MG1–1.26.1, as "totally-enclosed non-ventilated (IP54, IC410)"[6] is "not equipped for cooling by means external to the enclosing parts." This means that the motor, when properly applied, does not require the use of any additional means of cooling installed external to the motor enclosure. The TENV motor is cooled by natural conduction and natural convection of

[6] IP refers to the IEC Standard 34–5: Classification of degrees of protection provided by enclosures for rotating machines. IC refers to the IEC Standard 34–6: Methods of cooling rotating machinery. The IP and IC codes are referenced in the NEMA designations for TENV and TEAO motors in MG1–1993 Part 1, "Classification According to Environmental Protection and Methods of Cooling," as a Suggested Standard for Future Design, since the TENV and TEAO motors conform to IEC Standards. Details of protection (IP) and methods of cooling (IC) are defined in MG1 Part 5 and Part 6, respectively.

the motor heat into the surrounding environment. As stated in NEMA MG1–1993, Suggested Standard for Future Design, paragraph MG1–1.26.1a, a TENV motor "is only equipped for cooling by free convection." The general requirement for the installation of the TENV motor is that it not be placed in a restricted space that would inhibit this natural dissipation of the motor heat. Most general purpose applications use motors which include a means for forcing air flow through or around the motor and usually through the enclosed space and, therefore, can be used in spaces that are more restrictive than those required for TENV motors. Placing a TENV motor in such common restricted areas is likely to cause the motor to overheat. The TENV motor may also be larger than the motors used in most general purpose applications, and would take up more of the available space, thus reducing the size of the open area surrounding the motor. Installation of a TENV motor might require, therefore, an additional means of ventilation to continually exchange the ambient around the motor.

A motor designated in NEMA MG1–1993 as "totally-enclosed air-over (IP54, IC417)" is intended to be cooled by ventilation means external to (*i.e.*, separate and independent from) the motor, such as a fan. The motor must be provided with the additional ventilation to prevent it from overheating.

Consequently, neither the TENV motor nor the TEAO motor would be suitable for most general purpose applications, and, DOE believes they are definite-purpose motors not covered by EPCA.

Integral Gearmotors

An "integral gearmotor" is an assembly of a motor and a specific gear drive or assembly of gears, such as a gear reducer, as a unified package. The motor portion of an integral gearmotor is not necessarily a complete motor, since the end bracket or mounting flange of the motor portion is also part of the gear assembly and cannot be operated when separated from the complete gear assembly. Typically, an integral gearmotor is not manufactured to standard T-frame dimensions specified in NEMA MG1. Moreover, neither the motor portion, not the entire integral gearmotor, are capable of being used in most general purpose applications without significant modifications. An integral gearmotor is also designed for a specific purpose and can have unique performance characteristics, physical dimensions, and casing, flange and shafting configurations. Consequently, integral gearmotors are outside the scope of the EPCA definition of "electric motor" and are not covered under EPCA.

However, an "electric motor," as defined by EPCA, which is connected to a stand alone mechanical gear drive or an assembly of gears, such as a gear reducer connected by direct coupling, belts, bolts, a kit, or other means, is covered equipment under EPCA.

IV. Electric Motors That Are Components in Certain Equipment

The primary function of an electric motor is to convert electrical energy to mechanical energy which then directly drives machinery such as pumps, fans, or compressors. Thus, an electric motor is always connected to a driven machine or apparatus. Typically the motor is incorporated into a finished product such as an air conditioner, a refrigerator, a machine tool, food processing equipment, or other commercial or industrial machinery. These products are commonly known as "original equipment" or "end-use equipment," and are manufactured by firms known as "original equipment manufacturers" (OEMs).

Many types of motors used in original equipment are covered under EPCA. As noted above, EPCA prescribes efficiency standards to be met by all covered electric motors manufactured after October 24, 1997, except that covered motors which require listing or certification by a nationally recognized safety testing laboratory need not meet the standards until after October 24, 1999. Thus, for motors that must comply after October 24, 1997, once inventories of motors manufactured before the deadline have been exhausted, only complying motors would be available for purchase and use by OEMs in manufacturing original equipment. Any non-complying motors previously included in such equipment would no longer be available.

The physical, and sometimes operational, characteristics of motors that meet EPCA efficiency standards normally differ from the characteristics of comparable existing motors that do not meet those standards. In part because of such differences, the Department is aware of two types of situations where strict application of the October 24, 1997, deadline could temporarily prevent the manufacture of, and remove from the marketplace, currently available original equipment.

One such situation is where an original equipment manufacturer uses an electric motor as a component in end-use equipment that requires listing or certification by a nationally recognized safety testing laboratory, even though the motor itself does not require listing or certification. In some of these instances, the file for listing or certification specifies the particular motor to be used. No substitution could be made for the motor without review and approval of the new motor and the entire system by the safety testing laboratory. Consequently, a specified motor that does not meet EPCA standards could not be replaced by a complying motor without such review and approval.

This re-listing or re-certification process is subject to substantial variation from one

piece of original equipment to the next. For some equipment, it could be a simple paperwork transaction between the safety listing or certification organization and the OEM, taking approximately four to eight weeks to complete. But the process could raise more complex system issues involving redesign of the motor or piece of equipment, or both, and actual testing to assure that safety and performance criteria are met, and could take several months to complete. The completion time could also vary depending on the response time of the particular safety approval agency. Moreover, in the period immediately after October 24, the Department believes wholesale changes could occur in equipment lines when OEMs must begin using motors that comply with EPCA. These changes are likely to be concentrated in the period immediately after EPCA goes into effect on October 24, and if many OEMs seek to re-list or re-certify equipment at the same time, substantial delays in the review and approval process at the safety approval agencies could occur. For these reasons, the Department is concerned that certain end-user equipment that requires safety listing or certification could become unavailable in the marketplace, because an electric motor specifically identified in a listing or certification is covered by EPCA and will become unavailable, and the steps have not been completed to obtain safety approval of the equipment when manufactured with a complying motor.

Second, a situation could exist where an electric motor covered by EPCA is constructed in a T-frame series or T-frame size that is smaller (but still standard) than that assigned by NEMA Standards Publication MG 13–1984 (R1990), sections 1.2 and 1.3, in order to fit into a restricted mounting space that is within certain end-use equipment. (Motors in IEC metric frame sizes and kilowatt ratings could also be involved in this type of situation.) In such cases, the manufacturer of the end-use equipment might need to redesign the equipment containing the mounting space to accommodate a larger motor that complies with EPCA. These circumstances as well could result in certain currently available equipment becoming temporarily unavailable in the market, since the smaller size motor would become unavailable before the original equipment had been re-designed to accommodate the larger, complying motor.

The Department understands that many motor manufacturers and OEMs became aware only recently that the electric motors addressed in the preceding paragraphs were covered by EPCA. This is largely for the same reasons, discussed above, that EPCA coverage of Category II motors was only recently recognized. In addition, the Department understands that some motor manufacturers and original equipment manufacturers confused motors that themselves require safety listing or certification, which need not comply until October 25, 1999, with motors that, while not subject to such requirements, are included in original equipment that requires safety listing or certification. Consequently, motor manufacturers and original equipment manufacturers took insufficient action to assure that appropriate complying motors would be available for the original equipment involved, and that the equipment could accommodate such motors. OEMs involved in such situations may often be unable to switch to motors that meet EPCA standards in the period immediately following October 24. To mitigate any hardship to purchasers of the original equipment, the Department intends to refrain from enforcing EPCA in certain limited circumstances, under the conditions described below.

Where a particular electric motor is specified in an approved safety listing or certification for a piece of original equipment, and the motor does not meet the applicable efficiency standard in EPCA, the Department's policy will be as follows: For the period of time necessary for the OEM to obtain a revised safety listing or certification for that piece of equipment, with a motor specified that complies with EPCA, but in no event beyond October 24, 1999, the Department would refrain from taking enforcement action under EPCA with respect to manufacture of the motor for installation in such original equipment. This policy would apply only where the motor has been manufactured and specified in the approved safety listing or certification prior to October 25, 1997.

Where a particular electric motor is used in a piece of original equipment and manufactured in a smaller than assigned frame size or series, and the motor does not meet the applicable efficiency standard in EPCA, the Department's policy will be as follows: For the period of time necessary for the OEM to re-design the piece of equipment to accommodate a motor that complies with EPCA, but in no event beyond October 24, 1999, the Department would refrain from enforcing the standard with respect to manufacture of the motor for installation in such original equipment. This policy would apply only to a model of motor that has been manufactured and included in the original equipment prior to October 25, 1997.

To allow the Department to monitor application of the policy set forth in the prior two paragraphs, the Department needs to be informed as to the motors being manufactured under the policy. Therefore, each motor manufacturer and OEM should jointly notify the Department as to each motor they will be manufacturing and using, respectively, after October 24, 1997, in the belief that it is covered by the policy. The notification should set forth: (1) The name of the motor manufacturer, and a description of the motor

by type, model number, and date of design or production; (2) the name of the original equipment manufacturer, and a description of the application where the motor is to be used; (3) the safety listing or safety certification organization and the existing listing or certification file or document number for which re-listing or re-certification will be requested, if applicable; (4) the reason and amount of time required for continued production of the motor, with a statement that a substitute electric motor that complies with EPCA could not be obtained by an earlier date; and (5) the name, address, and telephone number of the person to contact for further information. The joint request should be signed by a responsible official of each requesting company, and sent to: U.S. Department of Energy, Assistant Secretary for Energy Efficiency and Renewable Energy, Office of Building Research and Standards, EE–41, Forrestal Building, 1000 Independence Avenue, SW., Room 1J–018, Washington, DC 20585–0121. The Department does not intend to apply this policy to any motor for which it does not receive such a notification. Moreover, the Department may use the notification, and make further inquiries, to be sure motors listed in the notification meet the criteria for application of the policy.

This part of the Policy Statement will not apply to a motor in Category II, discussed above in Section III. Because up to 24 months is contemplated for compliance by Category II motors, the Department believes any issues that might warrant a delay of enforcement for such motors can be addressed during that time period.

V. Further Information

The Department intends to incorporate this Policy Statement into an appendix to its final rule to implement the EPCA provisions that apply to motors. Any comments or suggestions with respect to this Policy Statement, as well as requests for further information, should be addressed to the Director, Building Technologies, EE–2J, U.S. Department of Energy, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585–0121.

EXAMPLES OF MANY COMMON FEATURES OR MOTOR MODIFICATIONS TO ILLUSTRATE HOW THE EPCA DEFINITIONS AND DOE GUIDELINES WOULD BE APPLIED TO MOTOR CATEGORIES: GENERAL PURPOSE; DEFINITE PURPOSE; AND SPECIAL PURPOSE

Motor modification	Category [1]					Explanation
	I	II	III	IV	V	
A. Electrical Modifications						
1 Altitude	X					General purpose up to a frame series change larger.
2 Ambient	X					General purpose up to a frame series change larger.
3 Multispeed					X	EPCA applies to single speed only.
4 Special Leads	X					
5 Special Insulation	X					
6 Encapsulation				X		Due to special construction.
7 High Service Factor	X					General purpose up to a frame series change larger.
8 Space Heaters	X					
9 Wye Delta Start	X					
10 Part Winding Start	X					
11 Temperature Rise	X					General purpose up to a frame series change larger.
12 Thermally Protected		X				Requires retesting and third party agency approval.
13 Thermostat/Thermistor	X					
14 Special Voltages					X	EPCA applies to motors operating on 230/460 voltages at 60 Hertz.
15 Intermediate Horsepowers		X				Round horsepower according to 10 CFR 431.42 for efficiency.
16 Frequency					X	EPCA applies to motors operating on 230/460 voltages at 60 Hertz.
17 Fungus/Trop Insulation	X					
B. Mechanical Modifications						
18 Special Balance	X					
19 Bearing Temp. Detector	X					
20 Special Base/Feet					X	Does not meet definition of T-frame.
21 Special Conduit Box	X					
22 Auxiliary Conduit Box	X					
23 Special Paint/Coating	X					
24 Drains	X					
25 Drip Cover	X					

EXAMPLES OF MANY COMMON FEATURES OR MOTOR MODIFICATIONS TO ILLUSTRATE HOW THE EPCA DEFINITIONS AND DOE GUIDELINES WOULD BE APPLIED TO MOTOR CATEGORIES: GENERAL PURPOSE; DEFINITE PURPOSE; AND SPECIAL PURPOSE—Continued

Motor modification	Category [1]					Explanation
	I	II	III	IV	V	
26 Ground. Lug/Hole	X					
27 Screens on ODP Enclosure	X					
28 Mounting F1,F2; W1–4; C1,2	X					Foot-mounting, rigid base, and resilient base.
C. Bearings						
29 Bearing Caps	X					
30 Roller Bearings		X				Test with a standard bearing.
31 Shielded Bearings	X					
32 Sealed Bearings	X					Test with a standard bearing.
33 Thrust Bearings				X		Special mechanical construction.
34 Clamped Bearings	X					
35 Sleeve Bearings				X		Special mechanical construction.
D. Special Endshields						
36 C Face	X					As defined in NEMA MG–1.
37 D Flange	X					As defined in NEMA MG–1.
38 Customer Defined				X		Special design for a particular application.
E. Seals						
39 Contact Seals	X					Includes lip seals and taconite seals—test with seals removed.
40 Non-Contact Seal	X					Includes labyrinth and slinger seals—test with seals installed.
F. Shafts						
41 Standard Shafts/NEMA Mg–1	X					Includes single and double, cylindrical, tapered, and short shafts.
42 Non Standard Material	X					
G. Fans						
43 Special Material	X					
44 Quiet Design	X					
H. Other Motors						
45 Washdown	X					Test with seals removed.
46 Close-coupled pump			X			JM and JP frame assignments.
47 Integral Gear Motor					X	Typically special mechanical design, and not a T-frame; motor and gearbox inseparable and operate as one system.
48 Vertical—Normal Thrust					X	EPCA covers foot-mounting.
49 Saw Arbor				X		Special electrical/mechanical design.
50 TENV			X			Totally-enclosed non-ventilated not equipped for cooling (IP54, IC410).
51 TEAO			X			Totally-enclosed air-over requires airflow from external source (IP54, IC417).
52 Fire Pump	X					When safety certification is not required. See also EPCA § 342(b)(1).
53 Non-continuous					X	EPCA covers continuous ratings.
54 Integral Brake Motor				X		Integral brake design factory built within the motor.

[1] Category I—General purpose electric motors as defined in EPCA.
Category II—Definite purpose electric motors that *can be used in most general purpose applications* as defined in EPCA.
Category III—Definite purpose motors as defined in EPCA.
Category IV—Special purpose motors as defined in EPCA.
Category V—Outside the scope of "electric motor" as defined in EPCA.

APPENDIX B TO SUBPART B OF PART 431—UNIFORM TEST METHOD FOR MEASURING NOMINAL FULL LOAD EFFICIENCY OF ELECTRIC MOTORS

1. *Definitions.*

Definitions contained in §§ 431.2 and 431.12 are applicable to this appendix.

2. *Test Procedures.*

Efficiency and losses shall be determined in accordance with NEMA MG1–1993 with Revisions 1 through 4, paragraph 12.58.1, "Determination of Motor Efficiency and Losses," (Incorporated by reference, see § 431.15) and either:

(1) CSA International (or Canadian Standards Association) Standard C390–93 Test Method (1), (Incorporated by reference, see § 431.15), *Input-Output Method With Indirect Measurement of the Stray-Load Loss and Direct Measurement of the Stator Winding (I^2R), Rotor Winding (I^2R), Core and Windage-Friction Losses*, or

(2) IEEE Standard 112–1996 Test Method B, *Input-Output With Loss Segregation*, (Incorporated by reference, see § 431.15) with IEEE correction notice of January 20, 1998, except as follows:

(i) Page 8, subclause 5.1.1., *Specified temperature*, the introductory clause does not apply. Instead the following applies:

The specified temperature used in making resistance corrections should be determined by one of the following (Test Method B only allows the use of preference (a) or (b).), which are listed in order of preference.

(ii) Page 17, subclause 6.4.1.3., *No-load test*, the text does not apply. Instead, the following applies:

See 5.3 including 5.3.3, the separation of core loss from friction and windage loss. Prior to making this test, the machine shall be operated at no-load until the input has stabilized.

(iii) Page 40, subclause 8.6.3, *Termination of test*, the third sentence does not apply. Instead, the following applies:

For continuous rated machines, the temperature test shall continue until there is 1 °C or less change in temperature rise over a 30-minute time period.

(iv) Page 47, at the top of 10.2 form B, immediately after the line that reads "Rated Load Heat Run Stator Winding Resistance Between Terminals," the following additional line applies:

Temperature for Resistance Correction (t_s) = – °C (See 6.4.3.2).

(v) Page 47, at the bottom of 10.2 Form B, after the first sentence to footnote t_t, the following additional sentence applies:

The values for t_s and t_t shall be based on the same method of temperature measurement, selected from the four methods in subclause 8.3.

(vi) Page 47, at the bottom of 10.2 Form B, below the footnotes and above "Summary of Characteristics," the following additional note applies:

NOTE: The temperature for resistance correction (t_s) is equal to [(4) – (5) + 25 °C].

(vii) Page 48, item (22), the torque constants "k = 9.549 for torque, in N·m" and "k = 7.043 for torque, in 1bf·ft" do not apply. Instead, the following applies:

"k_2 = 9.549 for torque, in N·m" and "k_2 = 7.043 for torque, in 1bf·ft."

(viii) Page 48, at the end of item (27), the following additional reference applies:

"See 6.4.3.2."

(ix) Page 48, item (29). "See 4.3.2.2, Eq. 4," does not apply. Instead the following applies:

Is equal to (10)·[k_1 + (4) – (5) + 25 °C] / [k_1 + (7)], see 6.4.3.3."

3. *Amendments to test procedures.*

Any revision to IEEE Standard 112–1996 Test Method B with correction notice of January 20, 1998, to NEMA Standards Publication MG1–1993 with Revisions 1 through 4, or to CSA Standard C390–93 Test Method (1), subsequent to promulgation of this appendix B, shall not be effective for purposes of test procedures required under Part 431 and this appendix B, unless and until Part 431 and this appendix B are amended.

APPENDIX C TO SUBPART B OF PART 431—COMPLIANCE CERTIFICATION

Certification of Compliance With Energy Efficiency Standards for Electric Motors

(Office of Management and Budget Control Number: 1910–5104. Expires 09/30/2007)

1. Name and Address of Company (the "company"):

_____

_____

_____

_____

2. Name(s) to be Marked on Electric Motors to Which this Compliance Certification Applies:

_____

_____

_____

_____

3. If manufacturer or private labeler wishes to receive a unique Compliance Certification number for use with any particular brand name, trademark, or other label name, fill out the following two items:

A. List each brand name, trademark, or other label name for which the company requests a Compliance Certification number:

_____

_____

_____

B. List other name(s), if any, under which the company sells electric motors (if not listed in item 2 above):

_____

Submit by Certified Mail to: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies (EE–2J), Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585–0121.

This Compliance Certification reports on and certifies compliance with requirements contained in 10 CFR Part 431 (Energy Conservation Program for Certain Commercial and Industrial Equipment) and Part C of the Energy Policy and Conservation Act (Pub. L. 94–163), and amendments thereto. It is signed by a responsible official of the above named company. Attached and incorporated as part of this Compliance Certification is a Listing of Electric Motor Efficiencies. For each rating of electric motor* for which the Listing specifies the nominal full load efficiency of a basic model, the company distributes no less efficient basic model with that rating and all basic models with that rating comply with the applicable energy efficiency standard.

*For this purpose, the term "rating" means one of the 113 combinations of an electric motor's horsepower (or standard kilowatt equivalent), number of poles, and open or enclosed construction, with respect to which § 431.25 of 10 CFR Part 431 prescribes nominal full load efficiency standards.

Person to Contact for Further Information:

Name: _____

Address: _____

_____

_____

_____

Telephone Number: _____

Facsimile Number: _____

If any part of this Compliance Certification, including the Attachment, was prepared by a third party organization under the provisions of 10 CFR 431.36, the company official authorizing third party representations:

Name: _____

Address: _____

_____

_____

_____

Telephone Number: _____

Facsimile Number: _____

Third Party Organization Officially Acting as Representative:

Third Party Organization: _____

Responsible Person at that Organization: _____

Address: _____

_____

_____

_____

Telephone Number: _____

Facsimile Number: _____

All required determinations on which this Compliance Certification is based were made in conformance with the applicable requirements in 10 CFR Part 431, subpart B. All information reported in this Compliance Certification is true, accurate, and complete. The company is aware of the penalties associated with violations of the Act and the regulations thereunder, and is also aware of the provisions contained in 18 U.S.C. 1001, which prohibits knowingly making false statements to the Federal Government.

Signature: _____

Date: _____

Name: _____

Title: _____

Firm or Organization: _____

ATTACHMENT TO CERTIFICATION OF COMPLIANCE WITH ENERGY EFFICIENCY STANDARDS FOR ELECTRIC MOTORS: LISTING OF ELECTRIC MOTOR EFFICIENCIES

Date: _____

Name of Company: _____

_____

Rating of electric motor			Least efficient basic model—(model numbers(s))	Nominal full load efficiency
Motor horsepower/kilowatts	Number of poles	Open or enclosed motor		
1 or .75	6	Open		
1 or .75	4	Open		
1 or .75	6	Enclosed		
1 or .75	4	Enclosed		
1 or .75	2	Enclosed		
1.5 or 1.1	6	Open		
1.5 or 1.1	4	Open		
1.5 or 1.1	2	Open		
1.5 or 1.1	6	Enclosed		
1.5 or 1.1	4	Enclosed		
1.5 or 1.1	2	Enclosed		
Etc.	Etc.	Etc.		

NOTE: Place an asterisk beside each reported nominal full load efficiency that is determined by actual testing rather than by application of an alternative efficiency determination method. Also list below additional basic models that were subjected to actual testing.

Basic Model means all units of a given type of electric motor (or class thereof) manufactured by a single manufacturer, and which (i) have the same rating, (ii) have electrical design characteristics that are essentially identical, and (iii) do not have any differing physical or functional characteristics that affect energy consumption or efficiency.

Rating means one of the 113 combinations of an electric motor's horsepower (or standard kilowatt equivalent), number of poles, and open or enclosed construction, with respect to which § 431.25 of 10 CFR Part 431 prescribes nominal full load efficiency standards.

MODELS ACTUALLY TESTED AND NOT PREVIOUSLY IDENTIFIED

Rating of electric motor			Basic model(s) (model number(s))	Nominal full load efficiency
Motor power output (e.g. 1 hp or .75 kW)	Number of poles	Open or enclosed motor		
Etc.	Etc.	Etc.	Etc.	Etc.

Subpart C—Commercial Refrigerators, Freezers and Refrigerator-Freezers

SOURCE: 70 FR 60414, Oct. 18, 2005, unless otherwise noted.

§ 431.61 Purpose and scope.

This subpart contains energy conservation requirements for commercial refrigerators, freezers and refrigerator-freezers, pursuant to Part C of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6311–6317.

§ 431.62 Definitions concerning commercial refrigerators, freezers and refrigerator-freezers.

Air-curtain angle means:

(1) For equipment without doors and without a discharge air grille or discharge air honeycomb, the angle between a vertical line extended down from the highest point on the manufacturer's recommended load limit line and the load limit line itself, when the equipment is viewed in cross-section; and

(2) For all other equipment without doors, the angle formed between a vertical line and the straight line drawn by connecting the point at the inside edge of the discharge air opening with the point at the inside edge of the return air opening, when the equipment is viewed in cross-section.

Basic model means, with respect to commercial refrigerators, freezers, and refrigerator-freezers, all units of a given type of commercial refrigerator, freezer, or refrigerator-freezer (or class thereof) manufactured by one manufacturer that have the same primary energy source, which have electrical characteristics that are essentially identical, and which do not have any differing electrical, physical, or functional characteristics that affect energy consumption.

Commercial refrigerator, freezer, and refrigerator-freezer means refrigeration equipment that—

(1) Is not a consumer product (as defined in § 430.2 of part 430);

(2) Is not designed and marketed exclusively for medical, scientific, or research purposes;

(3) Operates at a chilled, frozen, combination chilled and frozen, or variable temperature;

(4) Displays or stores merchandise and other perishable materials horizontally, semi-vertically, or vertically;

(5) Has transparent or solid doors, sliding or hinged doors, a combination of hinged, sliding, transparent, or solid doors, or no doors;

(6) Is designed for pull-down temperature applications or holding temperature applications; and

(7) Is connected to a self-contained condensing unit or to a remote condensing unit.

Commercial hybrid refrigerator, freezer, and refrigerator-freezer means a commercial refrigerator, freezer, or refrigerator-freezer that has two or more chilled and/or frozen compartments that are:

(1) In two or more different equipment families,

(2) Contained in one cabinet, and

(3) Sold as a single unit.

Door angle means:

(1) For equipment with flat doors, the angle between a vertical line and the line formed by the plane of the door, when the equipment is viewed in cross-section; and

(2) For equipment with curved doors, the angle formed between a vertical line and the straight line drawn by connecting the top and bottom points where the display area glass joins the cabinet, when the equipment is viewed in cross-section.

Holding temperature application means a use of commercial refrigeration equipment other than a pull-down temperature application, except a blast chiller or freezer.

Horizontal Closed means equipment with hinged or sliding doors and a door angle greater than or equal to 45°.

Horizontal Open means equipment without doors and an air-curtain angle greater than or equal to 80° from the vertical.

Ice-cream freezer means a commercial freezer that is designed to operate at or below −5 °F (−21 °C) and that the manufacturer designs, markets, or intends for the storing, displaying, or dispensing of ice cream.

Integrated average temperature means the average temperature of all test package measurements taken during the test.

Pull-down temperature application means a commercial refrigerator with doors that, when fully loaded with 12 ounce beverage cans at 90 degrees F, can cool those beverages to an average stable temperature of 38 degrees F in 12 hours or less.

Remote condensing unit means a factory-made assembly of refrigerating components designed to compress and liquefy a specific refrigerant that is remotely located from the refrigerated equipment and consists of 1 or more refrigerant compressors, refrigerant condensers, condenser fans and motors, and factory supplied accessories.

Self-contained condensing unit means a factory-made assembly of refrigerating components designed to compress and liquefy a specific refrigerant that is an integral part of the refrigerated equipment and consists of 1 or more refrigerant compressors, refrigerant condensers, condenser fans and motors, and factory supplied accessories.

Semivertical Open means equipment without doors and an air-curtain angle greater than or equal to 10° and less than 80° from the vertical.

Test package means a packaged material that is used as a standard product temperature-measuring device.

Vertical Closed means equipment with hinged or sliding doors and a door angle less than 45°.

Vertical Open means equipment without doors and an air-curtain angle greater than or equal to 0° and less than 10° from the vertical.

Wedge case means a commercial refrigerator, freezer, or refrigerator-freezer that forms the transition between two regularly shaped display cases.

[70 FR 60414, Oct. 18, 2005, as amended at 71 FR 71369, Dec. 8, 2006; 74 FR 1139, Jan. 9, 2009]

TEST PROCEDURES

§ 431.63 Materials incorporated by reference.

(a) *General.* We incorporate by reference the following standards into Subpart C of Part 431. The material listed has been approved for incorporation by reference by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR 51. Any subsequent amendment to a standard by the standard-setting organization will not affect the DOE regulations unless and until amended by DOE. Material is incorporated as it exists on the date of the approval and a notice of any change in the material will be published in the FEDERAL REGISTER. All approved material is available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030 or go to *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html*. Also, this material is available for inspection at U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, 6th Floor, 950 L'Enfant Plaza, SW., Washington, DC 20024, 202–586–2945, or go to: *http://www1.eere.energy.gov/buildings/*

appliance_standards/. Standards can be obtained from the sources listed below.

(b) *ANSI*. American National Standards Institute, 25 W. 43rd Street, 4th Floor, New York, NY 10036, 212–642–4900, or go to *http://www.ansi.org:*

(1) ANSI /AHAM HRF–1–2004, *Energy, Performance and Capacity of Household Refrigerators, Refrigerator-Freezers and Freezers*, approved July 7, 2004, IBR approved for § 431.64.

(2) [Reserved]

(c) ARI. Air-Conditioning and Refrigeration Institute, 4100 N. Fairfax Dr., Suite 200, Arlington, VA 22203, or *http://www.ari.org/std/standards.html:*

(1) ARI Standard 1200–2006, *Performance Rating of Commercial Refrigerated Display Merchandisers and Storage Cabinets*, 2006, IBR approved for §§ 431.64 and 431.66.

(2) [Reserved]

[74 FR 1139, Jan. 9, 2009]

§ 431.64 Uniform test method for the measurement of energy consumption of commercial refrigerators, freezers, and refrigerator-freezers.

(a) *Scope*. This section provides the test procedures for measuring, pursuant to EPCA, the daily energy consumption in kilowatt hours per day (kWh/day) for a given product category and volume or total display area of commercial refrigerators, freezers, and refrigerator-freezers.

(b) *Testing and calculations*. (1) Determine the daily energy consumption of each covered commercial refrigerator, freezer, or refrigerator-freezer by conducting the test procedure set forth in the Air-Conditioning and Refrigeration Institute (ARI) Standard 1200–2006, "Performance Rating of Commercial Refrigerated Display Merchandisers and Storage Cabinets," section 3, "Definitions," section 4, "Test Requirements," and section 7, "Symbols and Subscripts." (Incorporated by reference, see § 431.63) For each commercial refrigerator, freezer, or refrigerator-freezer with a self-contained condensing unit, also use ARI Standard 1200–2006, section 6, "Rating Requirements for Self-contained Commercial Refrigerated Display Merchandisers and Storage Cabinets." (Incorporated by reference, see § 431.63) For each commercial refrigerator, freezer, or refrigerator-freezer with a remote condensing unit, also use ARI Standard 1200–2006, section 5, "Rating Requirements for Remote Commercial Refrigerated Display Merchandisers and Storage Cabinets." (Incorporated by reference, see § 431.63)

(2) Conduct the testing required in paragraphs (b)(1) of this section, and determine the daily energy consumption, at the applicable integrated average temperature in the following table. The integrated average temperature is determined using the required test method.

Category	Test procedure	Integrated average temperatures
(i) Refrigerator with Solid Door(s)	ARI Standard 1200–2006*	38 °F (±2 °F).
(ii) Refrigerator with Transparent Door(s)	ARI Standard 1200–2006*	38 °F (±2 °F).
(iii) Freezer with Solid Door(s)	ARI Standard 1200–2006*	0 °F (±2 °F).
(iv) Freezer with Transparent Door(s)	ARI Standard 1200–2006*	0 °F (±2 °F).
(v) Refrigerator-Freezer with Solid Door(s)	ARI Standard 1200–2006*	38 °F (±2 °F) for refrigerator compartment. 0 °F (±2 °F) for freezer compartment.
(vi) Commercial Refrigerator with a Self-Contained Condensing Unit Designed for Pull-Down Temperature Applications and Transparent Doors.	ARI Standard 1200–2006*	38 °F (±2 °F).
(vii) Ice-Cream Freezer	ARI Standard 1200–2006*	−15.0 °F (±2 °F).
(viii) Commercial Refrigerator, Freezer, and Refrigerator-Freezer with a Self-Contained Condensing Unit and without Doors.	ARI Standard 1200–2006*	(A) For low temperature applications, the integrated average temperature of all test package averages shall be 0 °F (±2 °F). (B) For medium temperature applications, the integrated average temperature of all test package averages shall be 38.0 °F (±2 °F).

Category	Test procedure	Integrated average temperatures
(ix) Commercial Refrigerator, Freezer, and Refrigerator-Freezer with a Remote Condensing Unit.	ARI Standard 1200–2006*	(A) For low temperature applications, the integrated average temperature of all test package averages shall be 0 °F (±2 °F). (B) For medium temperature applications, the integrated average temperature of all test package averages shall be 38.0 °F (±2 °F).

* Incorporated by reference, see § 431.63.

(3) Determine the volume of each covered commercial refrigerator, freezer, or refrigerator-freezer using the methodology set forth in the ANSI/AHAM HRF–1–2004, "Energy, Performance and Capacity of Household Refrigerators, Refrigerator-Freezers and Freezers," (Incorporated by reference, see § 431.63) section 3.21, "Volume," sections 4.1 through 4.3, "Method for Computing Total Refrigerated Volume and Total Shelf Area of Household Refrigerators and Household Wine Chillers," and sections 5.1 through 5.3, "Method for Computing Total Refrigerated Volume and Total Shelf Area of Household Freezers."

§ 431.65 Units to be tested.

For each basic model of commercial refrigerator, freezer, or refrigerator-freezer selected for testing, a sample of sufficient size shall be selected at random and tested to ensure that—

(a) Any represented value of estimated energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of:

(1) The mean of the sample, or

(2) The upper 95 percent confidence limit of the true mean divided by 1.10; 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 no greater than the lower of:

(1) The mean of the sample, or

(2) The lower 95 percent confidence limit of the true mean divided by 0.90.

(Components of similar design may be substituted without requiring additional testing if the represented measures of energy continue to satisfy the applicable sampling provision.)

[75 FR 666, Jan. 5, 2010]

Energy Conservation Standards

§ 431.66 Energy conservation standards and their effective dates.

(a) In this section—

(1) The term "AV" means the adjusted volume (ft^3) (defined as 1.63 × frozen temperature compartment volume (ft^3) + chilled temperature compartment volume (ft^3)) with compartment volumes measured in accordance with the Association of Home Appliance Manufacturers Standard HRF1–1979.

(2) The term "V" means the chilled or frozen compartment volume (ft^3) (as defined in the Association of Home Appliance Manufacturers Standard HRF1–1979).

(3) The term "TDA" means the total display area (ft^2) of the case, as defined in the ARI Standard 1200–2006, appendix D (incorporated by reference, see § 431.63).

(b) Each commercial refrigerator, freezer, and refrigerator-freezer with a self-contained condensing unit designed for holding temperature applications manufactured on or after January 1, 2010, shall have a daily energy consumption (in kilowatt hours per day) that does not exceed the following:

Category	Maximum daily energy consumption (kilowatt hours per day)
Refrigerators with solid doors	0.10V + 2.04.
Refrigerators with transparent doors.	0.12V + 3.34.
Freezers with solid doors	0.40V + 1.38.
Freezers with transparent doors.	0.75V + 4.10.
Refrigerator/freezers with solid doors.	the greater of 0.27AV–0.71 or 0.70.

(c) Each commercial refrigerator with a self-contained condensing unit

designed for pull-down temperature applications and transparent doors manufactured on or after January 1, 2010, shall have a daily energy consumption (in kilowatt hours per day) of not more than 0.126V + 3.51.

(d) Each commercial refrigerator, freezer, and refrigerator-freezer with a self-contained condensing unit and without doors; commercial refrigerator, freezer, and refrigerator-freezer with a remote condensing unit; and commercial ice-cream freezer manufactured on or after January 1, 2012, shall have a daily energy consumption (in kilowatt hours per day) that does not exceed the levels specified:

(1) For equipment other than hybrid equipment, refrigerator-freezers or wedge cases:

Equipment category	Condensing unit configuration	Equipment family	Rating temp. (°F)	Operating temp. (°F)	Equipment class designation*	Maximum daily energy consumption (kWh/day)
Remote Condensing Commercial Refrigerators and Commercial Freezers.	Remote (RC)	Vertical Open (VOP).	38 (M)	≥32	VOP.RC.M	0.82 × TDA + 4.07
			0 (L)	<32	VOP.RC.L	2.27 × TDA + 6.85
		Semivertical Open (SVO).	38 (M)	≥32	SVO.RC.M	0.83 × TDA + 3.18
			0 (L)	<32	SVO.RC.L	2.27 × TDA + 6.85
		Horizontal Open (HZO).	38 (M)	≥32	HZO.RC.M	0.35 × TDA + 2.88
			0 (L)	<32	HZO.RC.L	0.57 × TDA + 6.88
		Vertical Closed Transparent (VCT).	38 (M)	≥32	VCT.RC.M	0.22 × TDA + 1.95
			0 (L)	<32	VCT.RC.L	0.56 × TDA + 2.61
		Horizontal Closed Transparent (HCT).	38 (M)	≥32	HCT.RC.M	0.16 × TDA + 0.13
			0 (L)	<32	HCT.RC.L	0.34 × TDA + 0.26
		Vertical Closed Solid (VCS).	38 (M)	≥32	VCS.RC.M	0.11 × V + 0.26
			0 (L)	<32	VCS.RC.L	0.23 × V + 0.54
		Horizontal Closed Solid (HCS).	38 (M)	≥32	HCS.RC.M	0.11 × V + 0.26
			0 (L)	<32	HCS.RC.L	0.23 × V + 0.54
		Service Over Counter (SOC).	38 (M)	≥32	SOC.RC.M	0.51 × TDA + 0.11
			0 (L)	<32	SOC.RC.L	1.08 × TDA + 0.22
Self-Contained Commercial Refrigerators and Commercial Freezers without Doors.	Self-Contained (SC).	Vertical Open (VOP).	38 (M)	≥32	VOP.SC.M	1.74 × TDA + 4.71
			0 (L)	<32	VOP.SC.L	4.37 × TDA + 11.82
		Semivertical Open (SVO).	38 (M)	≥32	SVO.SC.M	1.73 × TDA + 4.59
			0 (L)	<32	SVO.SC.L	4.34 × TDA + 11.51
		Horizontal Open	38 (M)	≥32	HZO.SC.M	0.77 × TDA + 5.55
			0 (L)	<32	HZO.SC.L	1.92 × TDA + 7.08
Commercial Ice-Cream Freezers.	Remote (RC)	Vertical Open (VOP).	−15 (I)	≤−5**	VOP.RC.I	2.89 × TDA + 8.7
		Semivertical Open (SVO).			SVO.RC.I	2.89 × TDA + 8.7
		Horizontal Open (HZO).			HZO.RC.I	0.72 × TDA + 8.74
		Vertical Closed Transparent (VCT).			VCT.RC.I	0.66 × TDA + 3.05
		Horizontal Closed Transparent (HCT).			HCT.RC.I	0.4 × TDA + 0.31
		Vertical Closed Solid (VCS).			VCS.RC.I	0.27 × V + 0.63
		Horizontal Closed Solid (HCS).			HCS.RC.I	0.27 × V + 0.63
		Service Over Counter (SVO).			SOC.RC.I	1.26 × TDA + 0.26
	Self-Contained (SC).	Vertical Open (VOP).			VOP.SC.I	5.55 × TDA + 15.02
		Semivertical Open (SVO).			SVO.SC.I	5.52 × TDA + 14.63
		Horizontal Open (HZO).			HZO.SC.I	2.44 × TDA + 9
		Vertical Closed Transparent (VCT).			VCT.SC.I	0.67 × TDA + 3.29

Equipment category	Condensing unit configuration	Equipment family	Rating temp. (°F)	Operating temp. (°F)	Equipment class designation*	Maximum daily energy consumption (kWh/day)
		Horizontal Closed Transparent (HCT).			HCT.SC.I	0.56 × TDA + 0.43
		Vertical Closed Solid (VCS).			VCS.SC.I	0.38 × V + 0.88
		Horizontal Closed Solid (HCS).			HCS.SC.I	0.38 × V + 0.88
		Service Over Counter (SVO).			SOC.SC.I	1.76 × TDA + 0.36

*The meaning of the letters in this column is indicated in the three columns to the left.
**Ice-cream freezer is defined in 10 CFR 431.62 as a commercial freezer that is designed to operate at or below −5 °F (−21 °C) and that the manufacturer designs, markets, or intends for the storing, displaying, or dispensing of ice cream.

(2) For commercial refrigeration equipment with two or more compartments (*i.e.*, hybrid refrigerators, hybrid freezers, hybrid refrigerator-freezers, and non-hybrid refrigerator-freezers), the maximum daily energy consumption (MDEC) for each model shall be the sum of the MDEC values for all of its compartments. For each compartment, measure the TDA or volume of that compartment, and determine the appropriate equipment class based on that compartment's equipment family, condensing unit configuration, and designed operating temperature. The MDEC limit for each compartment shall be the calculated value obtained by entering that compartment's TDA or volume into the standard equation in paragraph (d)(1) of this section for that compartment's equipment class. Measure the calculated daily energy consumption (CDEC) or total daily energy consumption (TDEC) for the entire case:

(i) For remote condensing commercial hybrid refrigerators, hybrid freezers, hybrid refrigerator-freezers, and non-hybrid refrigerator-freezers, where two or more independent condensing units each separately cool only one compartment, measure the total refrigeration load of each compartment separately according to the ARI Standard 1200–2006 test procedure (incorporated by reference, see §431.63). Calculate compressor energy consumption (CEC) for each compartment using Table 1 in ARI Standard 1200–2006 using the saturated evaporator temperature for that compartment. The CDEC for the entire case shall be the sum of the CEC for each compartment, fan energy consumption (FEC), lighting energy consumption (LEC), anti-condensate energy consumption (AEC), defrost energy consumption (DEC), and condensate evaporator pan energy consumption (PEC) (as measured in ARI Standard 1200–2006).

(ii) For remote condensing commercial hybrid refrigerators, hybrid freezers, hybrid refrigerator-freezers, and non-hybrid refrigerator-freezers, where two or more compartments are cooled collectively by one condensing unit, measure the total refrigeration load of the entire case according to the ARI Standard 1200–2006 test procedure (incorporated by reference, see §431.63). Calculate a weighted saturated evaporator temperature for the entire case by:

(A) Multiplying the saturated evaporator temperature of each compartment by the volume of that compartment (as measured in ARI Standard 1200–2006),

(B) Summing the resulting values for all compartments, and

(C) Dividing the resulting total by the total volume of all compartments.

Calculate the CEC for the entire case using Table 1 in ARI Standard 1200–2006 (incorporated by reference, see §431.63), using the total refrigeration load and the weighted average saturated evaporator temperature. The CDEC for the entire case shall be the sum of the CEC, FEC, LEC, AEC, DEC, and PEC.

(iii) For self-contained commercial hybrid refrigerators, hybrid freezers, hybrid refrigerator-freezers, and non-hybrid refrigerator-freezers, measure the TDEC for the entire case according to the ARI Standard 1200–2006 test procedure (incorporated by reference, see §431.63).

(3) For remote-condensing and self-contained wedge cases, measure the CDEC or TDEC according to the ARI Standard 1200–2006 test procedure (incorporated by reference, see § 431.63). The MDEC for each model shall be the amount derived by incorporating into the standards equation in paragraph (d)(1) of this section for the appropriate equipment class a value for the TDA that is the product of:

(i) The vertical height of the air-curtain (or glass in a transparent door) and (ii) The largest overall width of the case, when viewed from the front.

[70 FR 60414, Oct. 18, 2005, as amended at 74 FR 1140, Jan. 9, 2009]

Subpart D—Commercial Warm Air Furnaces

SOURCE: 69 FR 61939, Oct. 21, 2004, unless otherwise noted.

§ 431.71 Purpose and scope.

This subpart contains energy conservation requirements for commercial warm air furnaces, pursuant to Part C of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6311–6317.

[69 FR 61939, Oct. 21, 2004, as amended at 70 FR 60415, Oct. 18, 2005]

§ 431.72 Definitions concerning commercial warm air furnaces.

The following definitions apply for purposes of this subpart D, and of subparts J through M of this part. Any words or terms not defined in this Section or elsewhere in this Part shall be defined as provided in Section 340 of the Act.

Commercial warm air furnace means a warm air furnace that is industrial equipment, and that has a capacity (rated maximum input) of 225,000 Btu per hour or more.

Thermal efficiency for a commercial warm air furnace equals 100 percent minus percent flue loss determined using test procedures prescribed under § 431.76.

Warm air furnace means a self-contained oil-fired or gas-fired furnace designed to supply heated air through ducts to spaces that require it and includes combination warm air furnace/electric air conditioning units but does not include unit heaters and duct furnaces.

TEST PROCEDURES

§ 431.75 Materials incorporated by reference.

(a) We incorporate by reference the following test procedures into subpart D of Part 431. The Director of the Federal Register has approved the material listed in paragraph (b) of this section for incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR 51. Any subsequent amendment to this material by the standard-setting organization will not affect the DOE test procedures unless and until DOE amends its test procedures. We incorporate the material as it exists on the date of the approval and a notice of any change in the material will be published in the FEDERAL REGISTER.

(b) *List of test procedures incorporated by reference.* (1) American National Standards Institute (ANSI) Standard Z21.47–1998, "Gas-Fired Central Furnaces," IBR approved for § 431.76.

(2) Underwriters Laboratories (UL) Standard 727–1994, "Standard for Safety Oil-Fired Central Furnaces," IBR approved for § 431.76.

(3) Sections 8.2.2, 11.1.4, 11.1.5, and 11.1.6.2 of the Hydronics Institute (HI) Division of GAMA Boiler Testing Standard BTS–2000, "Method to Determine Efficiency of Commercial Space Heating Boilers," published January 2001 (HI BTS–2000), IBR approved for § 431.76.

(4) Sections 7.2.2.4, 7.8, 9.2, and 11.3.7 of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) Standard 103–1993, " Method of Testing for Annual Fuel Utilization Efficiency of Residential Central Furnaces and Boilers," IBR approved for § 431.76.

(c) *Availability of references*—(1) *Inspection of test procedures.* The test procedures incorporated by reference are available for inspection at:

(i) National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call (202) 741–6030, or go to: *http://www.archives.gov/federal__register/*

code__of__federal__regulations/ibr__locations.html.

(ii) U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Hearings and Dockets, "Test Procedures and Efficiency Standards for Commercial Warm Air Furnaces; Efficiency Certification, Compliance, and Enforcement Requirements for Commercial Heating, Air Conditioning and Water Heating Equipment;" Docket No. EE–RM/TP–99–450, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585.

(2) *Obtaining copies of Standards.* Anyone can purchase a copy of standards incorporated by reference from the following sources:

(i) The ASHRAE Standard from the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., 1971 Tullie Circle, NE., Atlanta, GA 30329, or *http://www.ashrae.org/book/bookshop.htm.*

(ii) The ANSI Standard from Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112, or *http://global.ihs.com/,* or *http://webstore.ansi.org/ansidocstore/.*

(iii) The UL Standard from Global Engineering Documents, 15 Inverness Way East, Englewood, CO 80112, or *http://global.ihs.com/.*

(iv) The HI Standard from the Hydronics Institute Division of GAMA, P.O. Box 218, Berkeley Heights, NJ 07922, or *http://www.gamanet.org/publist/hydroordr.htm.*

§ 431.76 Uniform test method for the measurement of energy efficiency of commercial warm air furnaces.

(a) This Section covers the test procedures you must follow if, pursuant to EPCA, you are measuring the steady state thermal efficiency of a gas-fired or oil-fired commercial warm air furnace with a rated maximum input of 225,000 Btu per hour or more. Where this Section prescribes use of ANSI standard Z21.47–1998 or UL standard 727–1994, (Incorporated by reference, see § 431.75), perform only the procedures pertinent to the measurement of the steady-state efficiency.

(b) *Test setup*—(1) *Test setup for gas-fired commercial warm air furnaces.* The test setup, including flue requirement, instrumentation, test conditions, and measurements for determining thermal efficiency is as specified in sections 1.1 (Scope), 2.1 (General), 2.2 (Basic Test Arrangements), 2.3 (Test Ducts and Plenums), 2.4 (Test Gases), 2.5 (Test Pressures and Burner Adjustments), 2.6 (Static Pressure and Air Flow Adjustments), 2.38 (Thermal Efficiency), and 4.2.1 (Basic Test Arrangements for Direct Vent Control Furnaces) of the ANSI Standard Z21.47–1998. The thermal efficiency test must be conducted only at the normal inlet test pressure, as specified in Section 2.5.1 of ANSI Standard Z21.47–1998, (Incorporated by reference, see § 431.75), and at the maximum hourly Btu input rating specified by the manufacturer for the product being tested.

(2) *Test setup for oil-fired commercial warm air furnaces.* The test setup, including flue requirement, instrumentation, test condition, and measurement for measuring thermal efficiency is as specified in sections 1 (Scope), 2 (Units of Measurement), 3 (Glossary), 37 (General), 38 and 39 (Test Installation), 40 (Instrumentation, except 40.4 and 40.6.2 through 40.6.7, which are not required for the thermal efficiency test), 41 (Initial Test Conditions), 42 (Combustion Test—Burner and Furnace), 43.2 (Operation Tests), 44 (Limit Control Cutout Test), 45 (Continuity of Operation Test), and 46 (Air Flow, Downflow or Horizontal Furnace Test), of the UL Standard 727–1994. You must conduct a fuel oil analysis for heating value, hydrogen content, carbon content, pounds per gallon, and American Petroleum Institute (API) gravity as specified in Section 8.2.2 of the HI BTS–2000 (Incorporated by reference, see § 431.75). The steady-state combustion conditions, specified in Section 42.1 of UL Standard 727–1994, (Incorporated by reference, see § 431.75), are attained when variations of not more than 5 °F in the measured flue gas temperature occur for three consecutive readings taken 15 minutes apart.

(c) *Additional test measurements*—(1) *Measurement of flue CO_2 (carbon dioxide) for oil-fired commercial warm air furnaces.* In addition to the flue temperature measurement specified in Section 40.6.8 of UL Standard 727–1994, (Incorporated by reference, see § 431.75) you must locate one or two sampling tubes

within six inches downstream from the flue temperature probe (as indicated on Figure 40.3 of UL Standard 727–1994) (Incorporated by reference, see § 431.75). If you use an open end tube, it must project into the flue one-third of the chimney connector diameter. If you use other methods of sampling CO_2, you must place the sampling tube so as to obtain an average sample. There must be no air leak between the temperature probe and the sampling tube location. You must collect the flue gas sample at the same time the flue gas temperature is recorded. The CO_2 concentration of the flue gas must be as specified by the manufacturer for the product being tested, with a tolerance of ±0.1 percent. You must determine the flue CO_2 using an instrument with a reading error no greater than ±0.1 percent.

(2) *Procedure for the measurement of condensate for a gas-fired condensing commercial warm air furnace.* The test procedure for the measurement of the condensate from the flue gas under steady state operation must be conducted as specified in sections 7.2.2.4, 7.8 and 9.2 of the ASHRAE Standard 103–1993 (Incorporated by reference, see § 431.75) under the maximum rated input conditions. You must conduct this condensate measurement for an additional 30 minutes of steady state operation after completion of the steady state thermal efficiency test specified in paragraph (b) of this section.

(d) *Calculations of thermal efficiency*—(1) *Gas-fired commercial warm air furnaces.* You must use the calculation procedure specified in Section 2.38, Thermal Efficiency, of ANSI Standard Z21.47–1998 (Incorporated by reference, see § 431.75).

(2) *Oil-fired commercial warm air furnaces.* You must calculate the percent flue loss (in percent of heat input rate) by following the procedure specified in sections 11.1.4, 11.1.5, and 11.1.6.2 of the HI BTS–2000 (Incorporated by reference, see § 431.75). The thermal efficiency must be calculated as:

Thermal Efficiency (percent) = 100 percent − flue loss (in percent).

(e) *Procedure for the calculation of the additional heat gain and heat loss, and adjustment to the thermal efficiency, for a condensing commercial warm air furnace.* (1) You must calculate the latent heat gain from the condensation of the water vapor in the flue gas, and calculate heat loss due to the flue condensate down the drain, as specified in sections 11.3.7.1 and 11.3.7.2 of ASHRAE Standard 103–1993, (Incorporated by reference, see § 431.75), with the exception that in the equation for the heat loss due to hot condensate flowing down the drain in Section 11.3.7.2, the assumed indoor temperature of 70 °F and the temperature term T_{OA} must be replaced by the measured room temperature as specified in Section 2.2.8 of ANSI Standard Z21.47–1998 (Incorporated by reference, see § 431.75).

(2) Adjustment to the Thermal Efficiency for Condensing Furnace. You must adjust the thermal efficiency as calculated in paragraph (d)(1) of this section by adding the latent gain, expressed in percent, from the condensation of the water vapor in the flue gas, and subtracting the heat loss (due to the flue condensate down the drain), also expressed in percent, both as calculated in paragraph (e)(1) of this section, to obtain the thermal efficiency of a condensing furnace.

ENERGY CONSERVATION STANDARDS

§ 431.77 Energy conservation standards and their effective dates.

Each commercial warm air furnace manufactured on or after January 1, 1994, must meet the following energy efficiency standard levels:

(a) For a gas-fired commercial warm air furnace with capacity of 225,000 Btu per hour or more, the thermal efficiency at the maximum rated capacity (rated maximum input) must be not less than 80 percent.

(b) For an oil-fired commercial warm air furnace with capacity of 225,000 Btu per hour or more, the thermal efficiency at the maximum rated capacity (rated maximum input) must be not less than 81 percent.

Subpart E—Commercial Packaged Boilers

SOURCE: 69 FR 61960, Oct. 21, 2004, unless otherwise noted.

§ 431.81 Purpose and scope.

This subpart contains energy conservation requirements for certain commercial packaged boilers, pursuant to Part C of Title III of the Energy Policy and Conservation Act. (42 U.S.C. 6311–6317)

[69 FR 61960, Oct. 21, 2004, as amended at 70 FR 60415, Oct. 18, 2005]

§ 431.82 Definitions concerning commercial packaged boilers.

The following definitions apply for purposes of this subpart E, and of subparts A and J through M of this part. Any words or terms not defined in this section or elsewhere in this part shall be defined as provided in 42 U.S.C. 6311.

Btu/h or *Btu/hr* means British thermal units per hour.

Combustion efficiency for a commercial packaged boiler is determined using test procedures prescribed under § 431.86 and is equal to 100 percent minus percent flue loss (percent flue loss is based on input fuel energy).

Commercial packaged boiler means a type of packaged low pressure boiler that is industrial equipment with a capacity, (rated maximum input) of 300,000 Btu per hour (Btu/hr) or more which, to any significant extent, is distributed in commerce:

(1) For heating or space conditioning applications in buildings; or

(2) For service water heating in buildings but does not meet the definition of "hot water supply boiler" in this part.

Condensing boiler means a commercial packaged boiler that condenses part of the water vapor in the flue gases, and that includes a means of collecting and draining this condensate from its heat exchanger section.

Flue condensate means liquid formed by the condensation of moisture in the flue gases.

Manufacturer of a commercial packaged boiler means any person who manufactures, produces, assembles or imports such a boiler, including any person who:

(1) Manufactures, produces, assembles or imports a commercial packaged boiler in its entirety;

(2) Manufactures, produces, assembles or imports a commercial packaged boiler in part, and specifies or approves the boiler's components, including burners or other components produced by others, as for example by specifying such components in a catalogue by make and model number or parts number; or

(3) Is any vendor or installer who sells a commercial packaged boiler that consists of a combination of components that is not specified or approved by a person described in paragraph (1) or (2) of this definition.

Packaged boiler means a boiler that is shipped complete with heating equipment, mechanical draft equipment and automatic controls; usually shipped in one or more sections and does not include a boiler that is custom designed and field constructed. If the boiler is shipped in more than one section, the sections may be produced by more than one manufacturer, and may be originated or shipped at different times and from more than one location.

Packaged high pressure boiler means a packaged boiler that is:

(1) A steam boiler designed to operate at a steam pressure higher than 15 psi gauge (psig); or

(2) A hot water boiler designed to operate at a water pressure above 160 psig or at a water temperature exceeding 250 °F, or both; or

(3) A boiler that is designed to be capable of supplying either steam or hot water, and designed to operate under the conditions in paragraphs (1) and (2) of this definition.

Packaged low pressure boiler means a packaged boiler that is:

(1) A steam boiler designed to operate at or below a steam pressure of 15 psig; or

(2) A hot water boiler designed to operate at or below a water pressure of 160 psig and a temperature of 250 °F; or

(3) A boiler that is designed to be capable of supplying either steam or hot water, and designed to operate under the conditions in paragraphs (1) and (2) of this definition.

Thermal efficiency for a commercial packaged boiler is determined using test procedures prescribed under § 431.86 and is the ratio of the heat absorbed by the water or the water and steam to

the higher heating value in the fuel burned.

[69 FR 61960, Oct. 21, 2004, as amended at 74 FR 36354, July 22, 2009]

TEST PROCEDURES

§ 431.85 Materials incorporated by reference.

(a) *General.* We incorporate by reference the following standards into Subpart E of Part 431. The material listed has been approved for incorporation by reference by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Any subsequent amendment to a standard by the standard-setting organization will not affect the DOE regulations unless and until amended by DOE. Material is incorporated as it exists on the date of the approval and a notice of any change in the material will be published in the FEDERAL REGISTER. All approved material is available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030 or go to *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.* Also, this material is available for inspection at U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, 6th Floor, 950 L'Enfant Plaza, SW., Washington, DC 20024, 202–586–2945, or go to: *http://www1.eere.energy.gov/buildings/appliance_standards/.* Standards can be obtained from the sources listed below.

(b) *HI.* The Gas Appliance Manufacturers Association (GAMA) merged in 2008 with the Air-Conditioning and Refrigeration Institute to become the Air-Conditioning, Heating, and Refrigeration Institute (AHRI). The Hydronics Institute BTS–2000 Testing Standard can be obtained from AHRI. For information on how to obtain this material, contact the Hydronics Institute Section of AHRI, P.O. Box 218, Berkeley Heights, NJ 07922–0218, (866) 408–3831, or go to: *http://www.ahrinet.org/Content/OrderaStandard_573.aspx.*

(1) The Hydronics Institute Division of GAMA BTS–2000 Testing Standard, ("HI BTS–2000, Rev 06.07"), *Method to Determine Efficiency of Commercial Space Heating Boilers,* Second Edition (Rev 06.07), 2007, IBR approved for § 431.86.

(2) [Reserved]

[74 FR 36354, July 22, 2009]

§ 431.86 Uniform test method for the measurement of energy efficiency of commercial packaged boilers.

(a) *Scope.* This section provides test procedures that must be followed for measuring, pursuant to EPCA, the steady state combustion efficiency and thermal efficiency of a gas-fired or oil-fired commercial packaged boiler. These test procedures apply to packaged low pressure boilers that have rated input capacities of 300,000 Btu/h or more and are "commercial packaged boilers," but do not apply under EPCA to "packaged high pressure boilers."

(b) *Definitions.* For purposes of this section, the Department incorporates by reference the definitions specified in Section 3.0 of the HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85), with the exception of the definition for the terms "packaged boiler," "condensing boilers," and "packaged low pressure steam" and "hot water boiler."

(c) *Test Method for Commercial Packaged Boilers—General.* Follow the provisions in this paragraph (c) for all testing of packaged low pressure boilers that are commercial packaged boilers.

(1) *Test Setup*—(i) *Classifications:* If employing boiler classification, you must classify boilers as given in Section 4.0 of the HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85).

(ii) *Requirements:* (A) Before March 2, 2012, conduct the combustion efficiency test as given in Section 5.2 (Combustion Efficiency Test) of the HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85) for all commercial packaged boiler equipment classes.

(B) On or after March 2, 2012, conduct the thermal efficiency test as given in Section 5.1 (Thermal Efficiency Test) of the HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85) for the following commercial packaged boiler equipment classes: Small, gas, hot water; small, gas, steam, all except natural draft; small, gas, steam, natural draft; small, oil, hot water; small, oil, steam; large, gas, steam, all except

natural draft; large, gas, steam, natural draft; and large, oil, steam. On or after March 2, 2012, conduct the combustion efficiency test as given in Section 5.2 (Combustion Efficiency Test) of the HI BTS–2000, Rev 06.07 for the following commercial packaged boiler equipment classes: Large, gas-fired, hot water and large, oil-fired, hot water.

(iii) *Instruments and Apparatus:* (A) Follow the requirements for instruments and apparatus in sections 6 (Instruments) and 7 (Apparatus), of the HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85), with the exception of section 7.2.5 (flue connection for outdoor boilers) which is replaced with paragraph (c)(1)(iii)(B) of this section:

(B) *Flue Connection for Outdoor Boilers:* Consistent with the procedure specified in section 7.2.1 of HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85), the integral venting used in oil-fired and power gas outdoor boilers may be modified only to the extent necessary to permit the boiler's connection to the test flue apparatus for testing.

(iv) *Test Conditions:* Use test conditions from Section 8.0 (excluding 8.6.2) of HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85) for combustion efficiency testing. Use all of the test conditions from Section 8.0 of HI BTS–2000, Rev 06.07 for thermal efficiency testing.

(2) *Test Measurements*—(i) *Non-Condensing Boilers:* (A) *Combustion Efficiency*. Measure for combustion efficiency according to sections 9.1 (excluding sections 9.1.1.2.3 and 9.1.2.2.3), 9.2 and 10.2 of the HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85).

(B) *Thermal Efficiency*. Measure for thermal efficiency according to sections 9.1 and 10.1 of the HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85).

(ii) *Procedure for the Measurement of Condensate for a Condensing Boiler*. For the combustion efficiency test, collect flue condensate as specified in Section 9.2.2 of HI BTS–2000, Rev 06.07 (incorporated by reference, see § 431.85). Measure the condensate from the flue gas under steady state operation for the 30 minute collection period during the 30 minute steady state combustion efficiency test. Flue condensate mass shall be measured immediately at the end of the 30 minute collection period to prevent evaporation loss from the sample. The humidity of the room shall at no time exceed 80 percent. Determine the mass of flue condensate for the steady state period by subtracting the tare container weight from the total container and flue condensate weight measured at the end of the test period. For the thermal efficiency test, collect and measure the condensate from the flue gas as specified in Section 9.1.1 and 9.1.2 of HI BTS–2000, Rev 06.07.

(iii) *A Boiler That is Capable of Supplying Either Steam or Hot Water*—(A) *Testing*. For purposes of EPCA, before March 2, 2012, measure the combustion efficiency of any size commercial packaged boiler capable of supplying either steam or hot water either by testing the boiler in the steam mode or by testing it in both the steam and hot water modes. On or after March 2, 2012, measure the combustion efficiency and thermal efficiency of a large (fuel input greater than 2,500 kBtu/h) commercial packaged boiler capable of supplying either steam or hot water either by testing the boiler for both efficiencies in steam mode, or by testing the boiler in both steam and hot water modes measuring the thermal efficiency of the boiler in steam mode and the combustion efficiency of the boiler in hot water mode. Measure only the thermal efficiency of a small (fuel input of greater than or equal to 300 kBtu/h and less than or equal to 2,500 kBtu/h) commercial packaged boiler capable of supplying either steam or hot water either by testing the boiler for thermal efficiency only in steam mode or by testing the boiler for thermal efficiency in both steam and hot water modes.

(B) *Rating*. If testing a large boiler only in the steam mode, use the efficiencies determined from such testing to rate the thermal efficiency for the steam mode and the combustion efficiency for the hot water mode. If testing a large boiler in both modes, rate the boiler's efficiency for each mode based on the testing in that mode. If testing a small boiler only in the steam mode, use the efficiencies determined from such testing to rate the thermal

efficiency for the steam mode and the hot water mode. If testing a small boiler in both modes, rate the boiler's efficiency for each mode based on the testing in that mode.

(3) *Calculation of Efficiency*—(i) *Combustion Efficiency*. Use the calculation procedure for the combustion efficiency test specified in Section 11.2 (including the specified subsections of 11.1) of the HI BTS–2000, Rev 06.07 (incorporated by reference, *see* § 431.85).

(ii) *Thermal Efficiency*. Use the calculation procedure for the thermal efficiency test specified in Section 11.1 of the HI BTS–2000, Rev 06.07 (incorporated by reference, *see* § 431.85).

[74 FR 36354, July 22, 2009]

ENERGY EFFICIENCY STANDARDS

§ 431.87 Energy conservation standards and their effective dates.

(a) Each commercial packaged boiler manufactured on or after January 1, 1994, and before March 2, 2012, must meet the following energy efficiency standard levels:

(1) For a gas-fired packaged boiler with a capacity (rated maximum input) of 300,000 Btu/h or more, the combustion efficiency at the maximum rated capacity must be not less than 80 percent.

(2) For an oil-fired packaged boiler with a capacity (rated maximum input) of 300,000 Btu/h or more, the combustion efficiency at the maximum rated capacity must be not less than 83 percent.

(b) Each commercial packaged boiler listed in Table 1 to § 431.87 and manufactured on or after the effective date listed in Table 1 of this section, must meet the applicable energy conservation standard in Table 1.

TABLE 1 TO § 431.87—COMMERCIAL PACKAGED BOILER ENERGY CONSERVATION STANDARDS

Equipment type	Subcategory	Size category (input)	Efficiency level—Effective date: March 2, 2012*
Hot Water Commercial Packaged Boilers	Gas-fired	≥300,000 Btu/h and ≤2,500,000 Btu/h.	80.0% E_T
Hot Water Commercial Packaged Boilers	Gas-fired	>2,500,000 Btu/h	82.0% E_C
Hot Water Commercial Packaged Boilers	Oil-fired	≥300,000 Btu/h and ≤2,500,000 Btu/h.	82.0% E_T
Hot Water Commercial Packaged Boilers	Oil-fired	>2,500,000 Btu/h	84.0% E_C
Steam Commercial Packaged Boilers	Gas-fired—all, except natural draft	≥300,000 Btu/h and ≤2,500,000 Btu/h.	79.0% E_T
Steam Commercial Packaged Boilers	Gas-fired—all, except natural draft	>2,500,000 Btu/h	79.0% E_T
Steam Commercial Packaged Boilers	Gas-fired—natural draft	≥300,000 Btu/h and ≤2,500,000 Btu/h.	77.0% E_T
Steam Commercial Packaged Boilers	Gas-fired—natural draft	>2,500,000 Btu/h	77.0% E_T
Steam Commercial Packaged Boilers	Oil-fired	≥300,000 Btu/h and ≤2,500,000 Btu/h.	81.0% E_T
Steam Commercial Packaged Boilers	Oil-fired	>2,500,000 Btu/h	81.0% E_T

*Where E_C is combustion efficiency and E_T is thermal efficiency as defined in § 431.82.

(c) Each commercial packaged boiler listed in Table 2 to § 431.87 and manufactured on or after the effective date listed in Table 2 of this section, must meet the applicable energy conservation standard in Table 2.

TABLE 2 TO § 431.87—COMMERCIAL PACKAGED BOILER ENERGY CONSERVATION STANDARDS

Equipment type	Subcategory	Size category (input)	Efficiency level—Effective date: March 2, 2022*
Steam Commercial Packaged Boilers	Gas-fired—natural draft	≥300,000 Btu/h and ≤2,500,000 Btu/h	79.0% E_T
Steam Commercial Packaged Boilers	Gas-fired—natural draft	>2,500,000 Btu/h	79.0% E_T

*Where E_C is combustion efficiency and E_T is thermal efficiency as defined in § 431.82.

[74 FR 36355, July 22, 2009]

Subpart F—Commercial Air Conditioners and Heat Pumps

SOURCE: 69 FR 61969, Oct. 21, 2004, unless otherwise noted.

§ 431.91 Purpose and scope.

This subpart specifies test procedures and energy conservation standards for certain commercial air conditioners and heat pumps, pursuant to Part C of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6311–6317.

[69 FR 61969, Oct. 21, 2004, as amended at 70 FR 60415, Oct. 18, 2005]

§ 431.92 Definitions concerning commercial air conditioners and heat pumps.

The following definitions apply for purposes of this subpart F, and of subparts J through M of this part. Any words or terms not defined in this section or elsewhere in this part shall be defined as provided in 42 U.S.C. 6311.

Coefficient of Performance, or COP means the ratio of the produced cooling effect of an air conditioner or heat pump (or its produced heating effect, depending on the mode of operation) to its net work input, when both the cooling (or heating) effect and the net work input are expressed in identical units of measurement.

Commercial package air-conditioning and heating equipment means air-cooled, water-cooled, evaporatively-cooled, or water source (not including ground water source) electrically operated, unitary central air conditioners and central air-conditioning heat pumps for commercial application.

Energy Efficiency Ratio, or EER means the ratio of the produced cooling effect of an air conditioner or heat pump to its net work input, expressed in Btu/watt-hour.

Heating seasonal performance factor, or HSPF means the total heating output of a central air-conditioning heat pump during its normal annual usage period for heating, expressed in Btu's and divided by the total electric power input, expressed in watt-hours, during the same period.

Large commercial package air-conditioning and heating equipment means commercial package air-conditioning and heating equipment that is rated—

(1) At or above 135,000 Btu per hour; and

(2) Below 240,000 Btu per hour (cooling capacity).

Non-standard size means a packaged terminal air conditioner or packaged terminal heat pump with existing wall sleeve dimensions having an external wall opening of less than 16 inches high or less than 42 inches wide, and a cross-sectional area less than 670 square inches.

Packaged terminal air conditioner means a wall sleeve and a separate unencased combination of heating and cooling assemblies specified by the builder and intended for mounting through the wall, and that is industrial equipment. It includes a prime source of refrigeration, separable outdoor louvers, forced ventilation, and heating availability by builder's choice of hot water, steam, or electricity.

Packaged terminal heat pump means a packaged terminal air conditioner that utilizes reverse cycle refrigeration as its prime heat source, that has a supplementary heat source available, with the choice of hot water, steam, or electric resistant heat, and that is industrial equipment.

Seasonal energy efficiency ratio or SEER means the total cooling output of a central air conditioner or central air-conditioning heat pump, expressed in Btu's, during its normal annual usage period for cooling and divided by the total electric power input, expressed in watt-hours, during the same period.

Single package unit means any central air conditioner or central air-conditioning heat pump in which all the major assemblies are enclosed in one cabinet.

Single package vertical air conditioner means air-cooled commercial package air conditioning and heating equipment that—

(1) Is factory-assembled as a single package that—

(i) Has major components that are arranged vertically;

(ii) Is an encased combination of cooling and optional heating components; and

(iii) Is intended for exterior mounting on, adjacent interior to, or through an outside wall;

(2) Is powered by a single-or 3-phase current;

(3) May contain 1 or more separate indoor grilles, outdoor louvers, various ventilation options, indoor free air discharges, ductwork, well plenum, or sleeves; and

(4) Has heating components that may include electrical resistance, steam, hot water, or gas, but may not include reverse cycle refrigeration as a heating means.

Single package vertical heat pump means a single package vertical air conditioner that—

(1) Uses reverse cycle refrigeration as its primary heat source; and

(2) May include secondary supplemental heating by means of electrical resistance, steam, hot water, or gas.

Small commercial package air-conditioning and heating equipment means commercial package air-conditioning and heating equipment that is rated below 135,000 Btu per hour (cooling capacity).

Split system means any central air conditioner or central air conditioning heat pump in which one or more of the major assemblies are separate from the others.

Standard size means a packaged terminal air conditioner or packaged terminal heat pump with wall sleeve dimensions having an external wall opening of greater than or equal to 16 inches high or greater than or equal to 42 inches wide, and a cross-sectional area greater than or equal to 670 square inches.

Very large commercial package air-conditioning and heating equipment means commercial package air-conditioning and heating equipment that is rated—

(1) At or above 240,000 Btu per hour; and

(2) Below 760,000 Btu per hour (cooling capacity).

[69 FR 61969, Oct. 21, 2004, as amended at 70 FR 60415, Oct. 18, 2005; 73 FR 58828, Oct. 7, 2008; 74 FR 12073, Mar. 23, 2009]

TEST PROCEDURES

§ 431.95 Materials incorporated by reference.

(a) The Department incorporates by reference the following test procedures into subpart F of part 431. The Director of the Federal Register has approved the material listed in paragraph (b) of this section for incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Any subsequent amendment to this material by the standard-setting organization will not affect the Department test procedures unless and until the Department amends its test procedures. The Department incorporates the material as it exists on the date of the approval and a notice of any change in the material will be published in the FEDERAL REGISTER.

(b) *List of test procedures incorporated by reference.* (1) Air-Conditioning and Refrigeration Institute (ARI) Standard 210/240–2003 published in 2003, "Unitary Air-Conditioning and Air-Source Heat Pump Equipment," IBR approved for § 431.96.

(2) ARI Standard 340/360–2004, "Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment."

(3) International Organization for Standardization (ISO) International Standard ISO 13256–1 published in 1998, "Water-source heat pumps—Testing and rating for performance—Part 1: Water-to-air and brine-to-air heat pumps," IBR approved for § 431.96.

(4) ARI Standard 310/380–2004 (CSA–C744–04) published in 2004, "Standard for Packaged Terminal Air-Conditioners and Heat Pumps," IBR approved for § 431.96.

(c) *Availability of references*—(1) *Inspection of test procedures.* You may inspect the test procedures incorporated by reference at:

(i) National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(ii) U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Hearings and Dockets, "Test Procedures and Efficiency Standards for Commercial Air Conditioners and Heat Pumps," Docket No. EE–RM/TP–99–460, 1000 Independence Avenue, SW., Washington, DC 20585.

(2) *Obtaining copies of test procedures.* You may obtain a copy of the ARI standards from the Air-Conditioning and Refrigeration Institute, 4301 North Fairfax Drive, Suite 425, Arlington, VA 22203, *http://www.ari.org/.* You can purchase a copy of the ISO Standard 13256–1 from the International Organization for Standardization, Case Postale 56, CH–1211, Geneva 20, Switzerland. *http://www.iso.ch/* or from the American National Standards Institute, 25 West 43rd Street, New York, New York 10036.

[69 FR 61969, Oct. 21, 2004, as amended at 71 FR 71370, Dec. 8, 2006]

§ 431.96 Uniform test method for the measurement of energy efficiency of small, large, and very large commercial package air conditioning and heating equipment, packaged terminal air conditioners, and packaged terminal heat pumps.

(a) *Scope.* This section contains test procedures for measuring, pursuant to EPCA, the energy efficiency of any small, large, or very large commercial package air-conditioning and heating equipment, packaged terminal air conditioner, or packaged terminal heat pump.

(b) *Testing and calculations.* Determine the energy efficiency of each covered product by conducting the test procedure(s) listed in the rightmost column of Table 1 of this section, that apply to the energy efficiency descriptor for that product, category, and cooling capacity.

TABLE 1 TO § 431.96—TEST PROCEDURES FOR ALL SMALL COMMERCIAL PACKAGE AIR-CONDITIONING AND HEATING EQUIPMENT, FOR LARGE COMMERCIAL PACKAGE AIR-CONDITIONING AND HEATING EQUIPMENT, FOR VERY LARGE COMMERCIAL PACKAGE AIR-CONDITIONING AND HEATING EQUIPMENT, AND FOR PACKAGED TERMINAL AIR-CONDITIONERS, AND PACKAGED TERMINAL HEAT PUMPS

Product	Category	Cooling capacity	Energy efficiency descriptor	Use tests, conditions and procedures [1] in
Small Commercial Packaged Air Conditioning and Heating Equipment.	Air Cooled, 3 Phase, AC and HP.	<65,000 Btu/h	SEER	ARI Standard 210/240–2003.
			HSPF	ARI Standard 210/240–2003.
	Air Cooled AC and HP	≥65,000 Btu/h and <135,000 Btu/h	EER	ARI Standard 340/360–2004.
			COP	ARI Standard 340/360–2004.
	Water Cooled and Evaporatively Cooled AC.	<65,000 Btu/h	EER	ARI Standard 210/240–2003.
		≥65,000 Btu/h and <135,000 Btu/h.	EER	ARI Standard 340/360–2004.
	Water-Source HP	<135,000 Btu/h	EER	ISO Standard 13256–1 (1998).
			COP	ISO Standard 13256–1 (1998).
Large Commercial Packaged Air-Conditioning and Heating Equipment.	Air Cooled AC and HP	≥135,000 Btu/h and <240,000 Btu/h.	EER	ARI Standard 340/360–2004.
			COP	ARI Standard 340/360–2004.
	Water Cooled AC	≥135,000 Btu/h and <240,000 Btu/h.	EER	ARI Standard 340/360–2004.
	Evaporatively Cooled AC	≥135,000 Btu/h and <240,000 Btu/h.	EER	ARI Standard 340/360–2004.
Very Large Commercial Packaged Air-Conditioning and Heating Equipment.	Air Cooled AC and HP	≥240,000 Btu/h and <760,000 Btu/h.	EER	ARI Standard 340/360–2004.
			COP	ARI Standard 340/360–2004.
Packaged Terminal Air-Conditioners and Heat Pumps.	AC and HP	All	EER	ARI Standard 310/380–2004.
	HP	All	COP	ARI Standard 310/380–2004.

[1] Incorporated by reference, see § 431.95.

[71 FR 73170, Dec. 8, 2006]

ENERGY EFFICIENCY STANDARDS

§ 431.97 Energy efficiency standards and their effective dates.

(a) Each commercial air conditioner or heat pump (including single package vertical air conditioners and single package vertical heat pumps) manufactured on or after January 1, 1994 (except for large commercial package air-conditioning and heating equipment, for which the effective date is January 1, 1995) must meet the applicable minimum energy efficiency standard level(s) set forth in Tables 1 and 2 of this section.

TABLE 1 TO § 431.97—MINIMUM COOLING EFFICIENCY LEVELS

Product	Category	Cooling capacity	Sub-category	Efficiency level [1]	
				Products manufactured until October 29, 2003	Products manufactured on and after October 29, 2003
Small Commercial Packaged Air Conditioning and Heating Equipment.	Air Cooled, 3 Phase.	<65,000 Btu/h	Split System Single Package	SEER = 10.0 SEER = 9.7	SEER = 10.0. SEER = 9.7.
	Air Cooled	≥65,000 Btu/h and <135,000 Btu/h.	All	EER = 8.9	EER = 8.9.
	Water Cooled, Evaporatively Cooled, and Water-Source.	<17,000 Btu/h	AC HP	EER = 9.3 EER = 9.3	EER = 12.1. EER = 11.2.
		≥17,000 Btu/h and <65,000 Btu/h.	AC HP	EER = 9.3 EER = 9.3	EER = 12.1. EER = 12.0.
		≥65,000 Btu/h and <135,000 Btu/h.	AC HP	EER = 10.5 EER = 10.5	EER = 11.5.[2] EER = 12.0.
Large Commercial Packaged Air Conditioning and Heating Equipment.	Air Cooled	≥135,000 Btu/h and <240,000 Btu/h.	All	EER = 8.5	EER = 8.5.
	Water-Cooled and Evaporatively Cooled.	≥135,000 Btu/h and <240,000 Btu/h.	All	EER = 9.6	EER = 9.6.[3]
Packaged Terminal Air Conditioners and Heat Pumps.	All	<7,000 Btu/h	All	EER = 8.88	EER = 8.88.
		≥7,000 Btu/h and ≤15,000 Btu/h.		EER = 10.0 − (0.16 × capacity [in kBtu/h at 95 °F outdoor dry-bulb temperature]).	EER = 10.0 − (0.16 × capacity [in kBtu/h at 95 °F outdoor dry-bulb temperature]).
		>15,000 Btu/h		EER = 7.6	EER = 7.6.

[1] For equipment rated according to the ARI standards, all EER values must be rated at 95 °F outdoor dry-bulb temperature for air-cooled products and evaporatively cooled products and at 85 °F entering water temperature for water-cooled products. For water-source heat pumps rated according to the ISO standard, EER must be rated at 30 °C (86 °F) entering water temperature.
[2] Deduct 0.2 from the required EER for units with heating sections other than electric resistance heat.
[3] Effective 10/29/2004, the minimum value became EER = 11.0.

TABLE 2 TO § 431.97—MINIMUM HEATING EFFICIENCY LEVELS

Product	Category	Cooling capacity	Sub-category	Efficiency level [1]	
				Products manufactured until October 29, 2003	Products manufactured on and after October 29, 2003
Small Commercial Packaged Air Conditioning and Heating Equipment.	Air Cooled, 3 Phase.	<65,000 Btu/h	Split System Single Package	HSPF = 6.8 HSPF = 6.6	HSPF = 6.8. HSPF = 6.6.
	Water-Source	<135,000 Btu/h	Split System and Single Package.	COP = 3.8	COP = 4.2.
	Air Cooled	≥65,000 Btu/h and <135,000 Btu/h.	All	COP = 3.0	COP = 3.0.

TABLE 2 TO § 431.97—MINIMUM HEATING EFFICIENCY LEVELS—Continued

Product	Category	Cooling capacity	Sub-category	Efficiency level [1]	
				Products manufactured until October 29, 2003	Products manufactured on and after October 29, 2003
Large Commercial Packaged Air Conditioning and Heating Equipment.	Air Cooled	≥135,000 Btu/h and <240,000 Btu/h.	Split System and Single Package.	COP = 2.9	COP = 2.9.
Packaged Terminal Heat Pumps.	All	All	All	COP = 1.3 + (0.16 × the applicable minimum cooling EER prescribed in Table 1—Minimum Cooling Efficiency Levels).	COP = 1.3 + (0.16 × the applicable minimum cooling EER prescribed in Table 1—Minimum Cooling Efficiency Levels).

[1] For units tested by ARI standards, all COP values must be rated at 47 °F outdoor dry-bulb temperature for air-cooled products, and at 70 °F entering water temperature for water-source heat pumps. For heat pumps tested by the ISO Standard 13256–1, the COP values must be obtained at the rating point with 20 °C (68 °F) entering water temperature.

(b) Commercial package air conditioning and heating equipment manufactured on or after January 1, 2010 (except for air-cooled, three-phase small commercial package air-conditioning and heating equipment <65,000 Btu/h for which the effective date is June 16, 2008) must meet the applicable energy efficiency standards set forth in this section.

Product	Cooling capacity (Btu/h)	Category	Efficiency level†
Small commercial package air conditioning and heating equipment, (air-cooled, three-phase).	<65,000	AC	SEER=13.0.
		HP	SEER=13.0. HSPF=7.7.
Single package vertical air conditioners and single package vertical heat pumps, single-phase and three phase.	<65,000	AC	EER=9.0.
		HP	EER=9.0. COP=3.0.
Single package vertical air conditioners and single package vertical heat pumps.	≥ 65,000 and <135,000	AC	EER=8.9.
		HP	EER=8.9. COP=3.0.
Single package vertical air conditioners and single package vertical heat pumps.	≥135,000 and <240,000	AC	EER=8.6.
		HP	EER=8.6. COP=2.9.
Small commercial package air-conditioning and heating equipment (air-cooled).	≥65,000 and <135,000	AC	EER = 11.2* EER = 11.0**
		HP	EER = 11.0* EER = 10.8**
Large commercial package air-conditioning and heating equipment (air-cooled).	≥135,000 and <240,000	AC	EER = 11.0* EER = 10.8**
		HP	EER = 10.6* EER = 10.4**
Very large commercial package air-conditioning and heating equipment (air-cooled).	≥ 240,000 and <760,000	AC	EER = 10.0* EER = 9.8**
		HP	EER = 9.5* EER = 9.3**
Small commercial package air-conditioning heat pump.	≥65,000 and <135,000	HP	COP = 3.3
Large commercial package air-conditioning heat pump.	≥135,000 and <240,000	HP	COP = 3.2
Very large commercial package air-conditioning heat pump.	≥ 240,000 and <760,000	HP	COP = 3.2

* This EER level applies to equipment that has electric resistance heat or no heating.
** This EER level applies to equipment with all other heating-system types that are integrated into the unitary equipment.
†EER at a standard temperature rating of 95 °F dry-bulb and COP at a high temperature rating of 47 °F dry-bulb.

(c) Each standard size packaged terminal air conditioner or packaged terminal heat pump manufactured on or after September 30, 2012 and each nonstandard size packaged terminal air conditioner or packaged terminal heat pump manufactured on or after September 30, 2010, shall have an Energy Efficiency Ratio and Coefficient of Performance no less than:

Equipment class			Energy conservation standards *
Equipment	Category	Cooling capacity (British thermal units per hour [Btu/h])	
PTAC	Standard Size	<7,000	EER = 11.7
		7,000–15,000	EER = 13.8 − (0.300 × Cap**)
		>15,000	EER = 9.3
	Non-Standard Size	<7,000	EER = 9.4
		7,000–15,000	EER = 10.9 − (0.213 × Cap**)
		>15,000	EER = 7.7
PTHP	Standard Size	<7,000	EER = 11.9
		7,000–15,000	COP = 3.3
		>15,000	EER = 14.0 − (0.300 × Cap**)
			COP = 3.7 − (0.052 × Cap**)
			EER = 9.5
			COP = 2.9
	Non-Standard Size	<7,000	EER = 9.3
		7,000–15,000	COP = 2.7
		>15,000	EER = 10.8 − (0.213 × Cap**)
			COP = 2.9 − (0.026 × Cap**)
			EER = 7.6
			COP = 2.5

* For equipment rated according to the DOE test procedure, all EER values must be rated at 95 °F outdoor dry-bulb temperature for air-cooled products and evaporatively-cooled products and at 85 °F entering water temperature for water cooled products. All COP values must be rated at 47 °F outdoor dry-bulb temperature for air-cooled products, and at 70 °F entering water temperature for water-source heat pumps.

** Cap means cooling capacity in thousand British thermal units per hour (Btu/h) at 95 °F outdoor dry-bulb temperature.

(d) Each water-cooled and evaporatively-cooled commercial package air conditioning and heating equipment with a cooling capacity at or above 240,000 Btu/h and less than 760,000 Btu/h manufactured on or after January 10, 2011, shall meet the following standard levels:

(1) For equipment that utilizes electric resistance heat or without heating, the energy efficiency ratio must be not less than 11.0.

(2) For equipment that utilizes all other types of heating, the energy efficiency ratio must be not less than 10.8.

[69 FR 61969, Oct. 21, 2004, as amended at 70 FR 60415, Oct. 18, 2005; 70 FR 61698, Oct. 25, 2005; 71 FR 71371, Dec. 8, 2006; 73 FR 58828, Oct. 7, 2008; 74 FR 12073, Mar. 23, 2009; 74 FR 36354, July 22, 2009]

Subpart G—Commercial Water Heaters, Hot Water Supply Boilers and Unfired Hot Water Storage Tanks

SOURCE: 69 FR 61983, Oct. 21, 2004, unless otherwise noted.

§ 431.101 Purpose and scope.

This subpart contains energy conservation requirements for certain commercial water heaters, hot water supply boilers and unfired hot water storage tanks, pursuant to Part C of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6311–6317.

[69 FR 61983, Oct. 21, 2004, as amended at 70 FR 60415, Oct. 18, 2005]

§ 431.102 Definitions concerning commercial water heaters, hot water supply boilers, and unfired hot water storage tanks.

The following definitions apply for purposes of this subpart G, and of subparts J through M of this part. Any words or terms not defined in this section or elsewhere in this part shall be defined as provided in section 340 of the Act, 42 U.S.C. 6311.

ASTM–D–2156–80 means the test standard published in 1980 by the American Society of Testing and Measurements and titled Method for Smoke Density in Flue Gases from Burning Distillate Fuels.

Hot water supply boiler means a packaged boiler that is industrial equipment and that,

(1) Has an input rating from 300,000 Btu/hr to 12,500,000 Btu/hr and of at least 4,000 Btu/hr per gallon of stored water,

(2) Is suitable for heating potable water, and

(3) Meets either or both of the following conditions:

(i) It has the temperature and pressure controls necessary for heating potable water for purposes other than space heating, or

(ii) The manufacturer's product literature, product markings, product marketing, or product installation and operation instructions indicate that the boiler's intended uses include heating potable water for purposes other than space heating.

Instantaneous water heater means a water heater that has an input rating not less than 4,000 Btu/hr per gallon of stored water, and that is industrial equipment, including products meeting this description that are designed to heat water to temperatures of 180 °F or higher.

Packaged boiler means a boiler that is shipped complete with heating equipment, mechanical draft equipment and automatic controls; usually shipped in one or more sections and does not include a boiler that is custom designed and field constructed. If the boiler is shipped in more than one section, the sections may be produced by more than one manufacturer, and may be originated or shipped at different times and from more than one location.

R-value means the thermal resistance of insulating material as determined based on ASTM Standard Test Method C177–97 or C518–91 and expressed in (°F·ft²·h/Btu).

Standby loss means the average hourly energy required to maintain the stored water temperature, expressed as applicable either (1) as a percentage (per hour) of the heat content of the stored water and determined by the formula for S given in Section 2.10 of ANSI Z21.10.3–1998, denoted by the term "S," or (2) in Btu per hour based on a 70 °F temperature differential between stored water and the ambient temperature, denoted by the term "SL."

Storage water heater means a water heater that heats and stores water within the appliance at a thermostatically controlled temperature for delivery on demand and that is industrial equipment. Such term does not include units with an input rating of 4,000 Btu/hr or more per gallon of stored water.

Tank surface area means, for the purpose of determining portions of a tank requiring insulation, those areas of a storage tank, including hand holes and manholes, in its uninsulated or pre-insulated state, that do not have pipe penetrations or tank supports attached.

Thermal efficiency for an instantaneous water heater, a storage water heater or a hot water supply boiler means the ratio of the heat transferred to the water flowing through the water heater to the amount of energy consumed by the water heater as measured during the thermal efficiency test procedure prescribed in this subpart.

Unfired hot water storage tank means a tank used to store water that is heated externally, and that is industrial equipment.

TEST PROCEDURES

§ 431.105 Materials incorporated by reference.

(a) The Department incorporates by reference the following test procedures into Subpart G of Part 431. The Director of the Federal Register has approved the material listed in paragraph (b) of this section for incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR Part 51. Any subsequent amendment to this material by the standard-setting organization will not affect the Department test procedures unless and until the Department amends its test procedures. The Department incorporates the material as it exists on the date of the approval and a notice of any change in the material will be published in the FEDERAL REGISTER.

(b) *Test procedure incorporated by reference.* American National Standards Institute (ANSI) Standard: "Gas Water Heaters, Volume III, Storage Water Heaters with Input Ratings above 75,000

Btu per Hour, Circulating and Instantaneous, Z21.10.3–1998, CSA 4.3–M98, and its Addenda, ANSI Z21.10.3a–2000, CSA 4.3a–M00," IBR approved for § 431.105. The Department is incorporating by reference the "Method of Test" subsections of sections 2.9 and 2.10 in ANSI Z21.10.3–1998, CSA 4.3–M98, and the sections referenced there, including sections 2.1.7, 2.3.3, 2.3.4, 2.30 and Figure 3.

(c) *Availability of references*—(1) *Inspection of test procedures.* The test procedures incorporated by reference are available for inspection at:

(i) National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal__register/code__of__federal__regulations/ibr__locations.html.*

(ii) U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Hearings and Dockets, "Test Procedures and Efficiency Standards for Commercial Water Heaters, Hot Water Supply Boilers, and Unfired Hot Water Storage Tanks," Docket No. EE–RM/TP–99–480, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585.

(2) *Obtaining copies of Standards.* Anyone can purchase a copy of the standard incorporated by reference from Global Engineering Documents, 15 Inverness Way West, Englewood, CO 80112, or *http://global.ihs.com/*, or *http://webstore.ansi.org/ansidocstore/.*

(d) *Reference standards*—(1) *General.* The standards listed in this paragraph are referred to in the Department test procedures in this subpart, but they are not incorporated by reference. These sources are given here for information and guidance.

(2) *List of References.* (i) ASTM Standard Test Method C518–91, "Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus."

(ii) ASTM Standard Test Method C177–97, "Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus."

(iii) ASTM Standard Test Method D2156–80, "Method for Smoke Density in Flue Gases from Burning Distillate Fuels."

§ 431.106 Uniform test method for the measurement of energy efficiency of commercial water heaters and hot water supply boilers (other than commercial heat pump water heaters).

(a) *Scope.* This section covers the test procedures you must follow if, pursuant to EPCA, you are measuring the thermal efficiency or standby loss, or both, of a storage or instantaneous water heater or hot water supply boiler (other than a commercial heat pump water heater).

(b) *Testing and Calculations.* Determine the energy efficiency of each covered product by conducting the test procedure(s), set forth in the two rightmost columns of the following table, that apply to the energy efficiency descriptor(s) for that product:

Product	Energy efficiency descriptor	Use test setup, equipment and procedures in subsection labeled "Method of Test" of	With these additional stipulations
Gas-fired Storage and Instantaneous Water Heaters and Hot Water Supply Boilers*.	Thermal Efficiency	ANSI Z21.10.3–1998, § 2.9**.	A. For all products, the duration of the standby loss test shall be until whichever of the following occurs first after you begin to measure the fuel and/or electric consumption: (1) The first cutout after 24 hours or (2) 48 hours, if the water heater is not in the heating mode at that time.

Product	Energy efficiency descriptor	Use test setup, equipment and procedures in subsection labeled "Method of Test" of	With these additional stipulations
	Standby Loss	ANSI Z21.10.3–1998, § 2.10**.	B. For oil and gas products, the standby loss in Btu per hour must be calculated as follows: SL (Btu per hour) = S (% per hour) × 8.25 (Btu/gal–F) × Measured Volume (gal) × 70 (degrees F). C. For oil-fired products, apply the following in conducting the thermal efficiency and standby loss tests: (1) Venting Requirements—Connect a vertical length of flue pipe to the flue gas outlet of sufficient height so as to meet the minimum draft specified by the manufacturer.
Oil-fired Storage and Instantaneous Water Heaters and Hot Water Supply Boilers*.	Thermal Efficiency	ANSI Z21.10.3–1998, § 2.9**.	(2) Oil Supply—Adjust the burner rate so that: (a) The hourly Btu input rate lies within ±2 percent of the manufacturer's specified input rate, (b) the CO_2 reading shows the value specified by the manufacturer, (c) smoke in the flue does not exceed No. 1 smoke as measured by the procedure in ASTM–D–2156–80, and (d) fuel pump pressure lies within ±10 percent of manufacturer's specifications.
	Standby Loss	ANSI Z21.10.3–1998, § 2.10**.	D. For electric products, apply the following in conducting the standby loss test: (1) Assume that the thermal efficiency (Et) of electric water heaters with immersed heating elements is 98 percent. (2) Maintain the electrical supply voltage to within ±5 percent of the center of the voltage range specified on the water heater nameplate.
Electric Storage and Instantaneous Water Heaters.	Standby Loss	ANSI Z21.10.3–1998, § 2.10**.	(3) If the set up includes multiple adjustable thermostats, set the highest one first to yield a maximum water temperature in the specified range as measured by the topmost tank thermocouple. Then set the lower thermostat(s) to yield a maximum mean tank temperature within the specified range.

*As to hot water supply boilers with a capacity of less than 10 gallons, these test methods become mandatory on October 21, 2005. Prior to that time, you may use for these products either (1) these test methods if you rate the product for thermal efficiency, or (2) the test methods in Subpart E if you rate the product for combustion efficiency as a commercial packaged boiler.
**Incorporated by reference, *see* § 431.105.

§ 431.107 Uniform test method for the measurement of energy efficiency of commercial heat pump water heaters. [Reserved]

ENERGY CONSERVATION STANDARDS

§ 431.110 Energy conservation standards and their effective dates.

Each commercial storage water heater, instantaneous water heater, unfired hot water storage tank and hot water supply boiler[1] must meet the applicable energy conservation standard level(s) as follows:

Product	Size	Energy conservation standard[a] (products manufactured on and after October 29, 2003)[b]	
		Minimum thermal efficiency	Maximum standby loss[c]
Electric storage water heaters.	All	N/A	$0.30 + 27/V_m$ (%/hr)
Gas-fired storage water heaters.	≤155,000 Btu/hr ...	80%	$Q/800 + 110(V_r)^{1/2}$ (Btu/hr)
	>155,000 Btu/hr ...	80%	$Q/800 + 110(V_r)^{1/2}$ (Btu/hr)
Oil-fired storage water heaters.	≤155,000 Btu/hr ...	78%	$Q/800 + 110(V_r)^{1/2}$ (Btu/hr)
	>155,000 Btu/hr ...	78%	$Q/800 + 110(V_r)^{1/2}$ (Btu/hr)
Gas-fired instantaneous water heaters and hot water supply boilers.	<10 gal	80%	N/A
	≥10 gal	80%	$Q/800 + 110(V_r)^{1/2}$ (Btu/hr)

[1] Any packaged boiler that provides service water, that meets the definition of "commercial packaged boiler" in subpart E of this part, but does not meet the definition of " hot water supply boiler" in subpart G, must meet the requirements that apply to it under subpart E.

Product	Size	Energy conservation standard[a] (products manufactured on and after October 29, 2003)[b]	
		Minimum thermal efficiency	Maximum standby loss[c]
Oil-fired instantaneous water heaters and hot water supply boilers.	<10 gal ≥10 gal	80% 78%	N/A $Q/800 + 110(V_r)^{1/2}$ (Btu/hr)

Product	Size	Minimum thermal insulation
Unfired hot water storage tank.	All	R–12.5

[a] V_m is the measured storage volume and V_r is the rated volume, both in gallons. Q is the nameplate input rate in Btu/hr.
[b] For hot water supply boilers with a capacity of less than 10 gallons: (1) the standards are mandatory for products manufactured on and after October 21, 2005, and (2) products manufactured prior to that date, and on or after October 23, 2003, must meet either the standards listed in this table or the applicable standards in Subpart E of this Part for a "commercial packaged boiler."
[c] Water heaters and hot water supply boilers having more than 140 gallons of storage capacity need not meet the standby loss requirement if (1) the tank surface area is thermally insulated to R–12.5 or more, (2) a standing pilot light is not used and (3) for gas or oil-fired storage water heaters, they have a fire damper or fan assisted combustion.

[69 FR 61983, Oct. 21, 2004; 69 FR 63574, Nov. 2, 2004]

Subpart H—Automatic Commercial Ice Makers

SOURCE: 70 FR 60415, Oct. 18, 2005, unless otherwise noted.

§ 431.131 Purpose and scope.

This subpart contains energy conservation requirements for commercial ice makers, pursuant to Part C of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6311–6317.

§ 431.132 Definitions concerning automatic commercial ice makers.

Automatic commercial ice maker means a factory-made assembly (not necessarily shipped in 1 package) that—

(1) Consists of a condensing unit and ice-making section operating as an integrated unit, with means for making and harvesting ice; and

(2) May include means for storing ice, dispensing ice, or storing and dispensing ice.

Basic model means, with respect to automatic commercial ice makers, all units of a given type of automatic commercial ice maker (or class thereof) manufactured by one manufacturer and which have the same primary energy source, which have electrical characteristics that are essentially identical, and which do not have any differing electrical, physical, or functional characteristics that affect energy consumption.

Cube type ice means ice that is fairly uniform, hard, solid, usually clear, and generally weighs less than two ounces (60 grams) per piece, as distinguished from flake, crushed, or fragmented ice.

Energy use means the total energy consumed, stated in kilowatt hours per one-hundred pounds (kWh/100 lb) of ice and stated in multiples of 0.1. For remote condensing automatic commercial ice makers, total energy consumed shall include condenser fan power.

Harvest rate means the amount of ice (at 32 degrees F) in pounds produced per 24 hours.

Ice-making head means automatic commercial ice makers that do not contain integral storage bins, but are generally designed to accommodate a variety of bin capacities. Storage bins entail additional energy use not included in the reported energy consumption figures for these units.

Maximum condenser water use means the maximum amount of water used by the condensing unit (if water-cooled), stated in gallons per 100 pounds (gal/100 lb) of ice, in multiples of 1.

Remote compressor means a type of automatic commercial ice maker in which the ice-making mechanism and compressor are in separate sections.

Remote condensing means a type of automatic commercial ice maker in which the ice-making mechanism and condenser or condensing unit are in separate sections.

Self-contained means a type of automatic commercial ice maker in which the ice-making mechanism and storage compartment are in an integral cabinet.

[70 FR 60415, Oct. 18, 2005, as amended at 71 FR 71371, Dec. 8, 2006]

TEST PROCEDURES

§ 431.133 Materials incorporated by reference.

(a) *General.* The Department incorporates by reference the following test procedures into subpart H of part 431. The Director of the Federal Register has approved the material listed in paragraph (b) of this section for incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Any subsequent amendment to this material by the standard-setting organization will not affect the DOE test procedures unless DOE amends its test procedures. The Department incorporates the material as it exists on the date of the approval by the Federal Register and a notice of any change in the material will be published in the FEDERAL REGISTER.

(b) *Test procedures incorporated by reference.* (1) Air-Conditioning and Refrigeration Institute (ARI) Standard 810–2003, "Performance Rating of Automatic Commercial Ice-Makers."

(2) American National Standards Institute (ANSI)/American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 29–1988 (RA 2005), "Methods of Testing Automatic Ice Makers."

(c) *Availability of references*—(1) *Inspection of test procedures.* The test procedures incorporated by reference are available for inspection at:

(i) National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call (202) 741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.*

(ii) U.S. Department of Energy, Forrestal Building, Room 1J–018 (Resource Room of the Building Technologies Program), 1000 Independence Avenue, SW., Washington, DC 20585–0121, (202) 586–9127, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays.

(2) *Obtaining copies of test procedures.* (i) Anyone can obtain a copy of ARI Standard 810–2003 from the Air-Conditioning and Refrigeration Institute, 4100 N. Fairfax Dr., Suite 200, Arlington, VA 22203 or *http://www.ari.org/std/standards.htm.*

(ii) Anyone can purchase a copy of ASHRAE Standard 29–1988 (RA 2005), "Methods of Testing Automatic Ice Makers," from the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., 1791 Tullie Circle, NE, Atlanta, GA 30329, (404) 636–8400, or *http://www.ashrae.org.*

[71 FR 71372, Dec. 8, 2006]

§ 431.134 Uniform test methods for the measurement of energy consumption and water consumption of automatic commercial ice makers.

(a) *Scope.* This section provides the test procedures for measuring, pursuant to EPCA, the energy use in kilowatt hours per 100 pounds of ice (kWh/100 lbs ice) and the condenser water use in gallons per 100 pounds of ice (gal/100 lbs ice).

(b) *Testing and Calculations.* Determine the energy consumed and the condenser water use rate of each covered product by conducting the test procedures, set forth in the Air-Conditioning and Refrigeration Institute's Standard 810–2003, "Performance Rating of Automatic Commercial Ice-Makers," section 4, "Test Requirements," and section 5, "Rating Requirements." (Incorporated by reference, see § 431.133) Do not use the formula in section 8.3 of ANSI/ASHRAE Standard 29–1988 (RA 2005) for calculating the power consumption, but instead calculate the energy use rate (kWh/100 lbs Ice) by dividing the energy consumed during testing by the total mass of the ice produced during the time period over which energy consumption is measured, normalized to 100 pounds of ice as follows:

$$\text{Energy Consumption Rate (per 100 lbs ice)} = \frac{\text{Energy Consumed During Testing (kWh)}}{\text{Mass of Ice Collected During Testing (lbs)}} \times 100\%$$

[71 FR 71372, Dec. 8, 2006]

§ 431.135 Units to be tested.

For each basic model of automatic commercial ice maker selected for testing, a sample of sufficient size shall be selected at random and tested to ensure that—

(a) Any represented value of estimated maximum energy use or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of:

(1) The mean of the sample, or

(2) The upper 95 percent confidence limit of the true mean divided by 1.10; 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 no greater than the lower of:

(1) The mean of the sample, or

(2) The lower 95 percent confidence limit of the true mean divided by 0.90.

(Components of similar design may be substituted without requiring additional testing if the represented measures of energy continue to satisfy the applicable sampling provision.)

[75 FR 666, Jan. 5, 2010]

ENERGY CONSERVATION STANDARDS

§ 431.136 Energy conservation standards and their effective dates.

Each automatic commercial ice maker that produces cube type ice with capacities between 50 and 2500 pounds per 24-hour period when tested according to the test standard established in accordance with section 343 of EPCA (42 U.S.C. 6314) and is manufactured on or after January 1, 2010, shall meet the following standard levels:

Equipment type	Type of cooling	Harvest rate (lbs ice/24 hours)	Maximum energy use (kWh/100 lbs ice)	Maximum condenser water use * (gal/100 lbs ice)
Ice Making Head	Water	<500	7.80–0.0055H	200–0.022H.
Ice Making Head	Water	≥500 and <1436	5.58–0.0011H	200–0.022H.
Ice Making Head	Water	≥1436	4.0	200–0.022H.
Ice Making Head	Air	<450	10.26–0.0086H	Not applicable.
Ice Making Head	Air	≥450	6.89–0.0011H	Not applicable.
Remote Condensing (but not remote compressor)	Air	<1000	8.85–0.0038H	Not applicable.
Remote Condensing (but not remote compressor)	Air	≥1000	5.1	Not applicable.
Remote Condensing and Remote Compressor	Air	<934	8.85–0.0038H	Not applicable.
Remote Condensing and Remote Compressor	Air	≥934	5.3	Not applicable.
Self Contained	Water	<200	11. 40–0.019H	191–0.0315H.
Self Contained	Water	≥200	7.6	191–0.0315H.
Self Contained	Air	<175	18.0–0.0469H	Not applicable.
Self Contained	Air	≥175	9.8	Not applicable.

H Harvest rate in pounds per 24 hours.
*Water use is for the condenser only and does not include potable water used to make ice.

[70 FR 60415, Oct. 18, 2005; 70 FR 61698, Oct. 25, 2005]

Subpart I—Commercial Clothers Washers

SOURCE: 70 FR 60416, Oct. 18, 2005, unless otherwise noted.

§ 431.151 Purpose and scope.

This subpart contains energy conservation requirements for commercial clothes washers, pursuant to Part C of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6311–6317.

§ 431.152 Definitions concerning commercial clothes washers.

Commercial clothes washer means a soft-mounted front-loading or soft-mounted top-loading clothes washer that—

(1) Has a clothes container compartment that—

(i) For horizontal-axis clothes washers, is not more than 3.5 cubic feet; and

(ii) For vertical-axis clothes washers, is not more than 4.0 cubic feet; and

(2) Is designed for use in—

(i) Applications in which the occupants of more than one household will be using the clothes washer, such as multi-family housing common areas and coin laundries; or

(ii) Other commercial applications.

TEST PROCEDURES

§ 431.154 Test procedures.

The test procedures for residential clothes washers in Appendix J1 to subpart B of part 430 of this title shall be used to test commercial clothes washers.

ENERGY CONSERVATION STANDARDS

§ 431.156 Energy and water conservation standards and effective dates.

Each CCW manufactured on or after January 8, 2013, shall have a modified energy factor no less than and a water factor no greater than:

Equipment class	Modified energy factor, *cu. ft./kWh/cycle*	Water factor, *gal./cu. ft./cycle*
Top-Loading	1.60	8.5
Front-Loading	2.00	5.5

[75 FR 1177, Jan. 8, 2010]

Subpart J—Provisions for Commercial Heating, Ventilating, Air-Conditioning and Water Heating Products

SOURCE: 75 FR 667, Jan. 5, 2010, unless otherwise noted.

§ 431.171 Purpose and scope. [Reserved]

§ 431.172 Definitions.

The following definitions apply for purposes of subparts D through G, J through K and subpart T of this part. Other terms in these subparts shall be defined elsewhere in the Part and, if not defined in this part, shall have the meaning set forth in section 340 of the Act.

Alternate efficiency determination method or AEDM means a method of calculating the efficiency of a commercial HVAC and WH product, in terms of the descriptor used in or under section 342(a) of the Act to state the energy conservation standard for that product.

Basic model means, with respect to a commercial HVAC & WH product, all units of such product, manufactured by one manufacturer, which have the same primary energy source and which do not have any differing electrical, physical, or functional characteristics that affect energy consumption.

Commercial HVAC & WH product means any small or large commercial package air-conditioning and heating equipment, packaged terminal air conditioner, packaged terminal heat pump, commercial packaged boiler, hot water supply boiler, commercial warm air furnace, instantaneous water heater, storage water heater, or unfired hot water storage tank.

Flue loss means the sum of the sensible heat and latent heat above room temperature of the flue gases leaving the appliance.

Industrial equipment means an article of equipment, regardless of whether it is in fact distributed in commerce for industrial or commercial use, of a type which:

(1) In operation consumes, or is designed to consume energy;

(2) To any significant extent, is distributed in commerce for industrial or commercial use; and

(3) Is not a "covered product" as defined in Section 321(2) of EPCA, 42 U.S.C. 6291(2), other than a component of a covered product with respect to which there is in effect a determination under Section 341(c) of EPCA, 42 U.S.C. 6312(c).

Private labeler means, with respect to a commercial HVAC & WH product, an owner of a brand or trademark on the label of a product which bears a private label. A commercial HVAC & WH product bears a private label if:

(1) Such product (or its container) is labeled with the brand or trademark of a person other than a manufacturer of such product;

(2) The person with whose brand or trademark such product (or container)

is labeled has authorized or caused such product to be so labeled; and

(3) The brand or trademark of a manufacturer of such product does not appear on such label.

[75 FR 4474, Jan. 28, 2010]

§ 431.173 Requirements applicable to all manufacturers.

(a) *General.* A manufacturer of a HVAC and WH product may not distribute any basic model of such equipment in commerce unless the manufacturer has determined the efficiency of the basic model either from testing of the basic model or from application of an alternative efficiency determination method (AEDM) to the basic model, in accordance with the requirements of this section. In instances where a manufacturer has tested that basic model to validate an AEDM, the efficiency of that basic model must be determined and rated according to results from actual testing. (For purposes of this subpart, the "efficiency" of a commercial HVAC and WH product means the energy efficiency or energy use of that product, expressed in terms of the descriptor that referenced in section 342(a) of the Act to state the energy conservation standard for that product.)

(b) *Testing.* If a manufacturer tests a basic model pursuant to this section to determine its efficiency, the manufacturer must:

(1) Select at random the unit(s) to be tested, which must be representative of the basic model,

(2) Perform the testing in accordance with the applicable Department of Energy test procedure,

(3) Meet industry standards for the measurement accuracy of testing for the equipment being tested. This includes accuracy requirements in applicable test procedures, accuracy achieved by laboratory-grade equipment, and the accuracy of calibration standards, and

(4) Meet the requirements of either § 431.174(b) or § 431.175(a), whichever is applicable.

(c) *Alternative efficiency determination methods*—(1) *Criteria an AEDM must satisfy.* You may not apply an AEDM to a basic model to determine its efficiency pursuant to this subpart unless:

(i) The AEDM is derived from a mathematical model that represents the energy consumption characteristics of the basic model; and

(ii) The AEDM is based on engineering or statistical analysis, computer simulation or modeling, or other analytic evaluation of performance data.

(2) *Subsequent verification of an AEDM.* If you have used an AEDM pursuant to this subpart,

(i) You must have available for inspection by the Department 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 you generated or acquired under paragraph (c)(1) of this section and §§ 431.174(c) or 431.(b)(1), as applicable; and

(D) The calculations used to determine the average efficiency and energy consumption of each basic model to which an AEDM was applied.

(ii) If requested by the Department, you must perform at least one of the following:

(A) Conduct simulations to predict the performance of particular basic models of the commercial HVAC and WH product;

(B) Provide analyses of previous simulations conducted by you;

(C) Conduct sample testing of basic models selected by the Department; or

(D) Conduct a combination of these.

(3) *Limitation on use of an AEDM.* A manufacturer may not knowingly use an AEDM to overrate the efficiency of a basic model.

§ 431.174 Additional requirements applicable to Voluntary Independent Certification Program participants.

(a) *Description of Voluntary Independent Certification Program participant.* For purposes of this subpart, a manufacturer that participates in a Voluntary Independent Certification Program (VICP) approved by the Department for a commercial HVAC and WH product, as described in § 431.176,

and that complies with all requirements imposed by that program, is a "VICP participant" with respect to that product.

(b) *Testing.* A VICP participant that tests a basic model pursuant to this subpart must use statistically valid and accurate methods to arrive at the efficiency rating of such basic model.

(c) *Alternative efficiency determination methods.* Before using an AEDM to determine the efficiency of a basic model pursuant to this subpart, a VICP participant must apply the AEDM to one or more basic models that have been tested in accordance with §§ 431.173(b) and 431.174(b) of this subpart, and the predicted efficiency calculated for each such basic model from application of the AEDM must be within 5 percent of the efficiency determined from testing that basic model. In addition, the predicted efficiency(ies) calculated for the tested basic model(s) must on average be within one percent of the efficiency(ies) determined from testing such basic model(s).

(d) *Limitation on use of an Alternative Efficiency Determination Method.* A manufacturer may not use an AEDM to overrate the efficiency of a basic model.

§ 431.175 Additional requirements applicable to non-Voluntary Independent Certification Program participants.

If you are a manufacturer that is not a VICP participant with respect to a particular type of commercial HVAC and WH product, you must meet the following requirements as to that product.

(a) *Testing.* You must perform any testing of a basic model pursuant to this subpart under the supervision of independent testing personnel, or have such testing performed at an independent laboratory. In addition, you must test a sufficient number of units of the basic model, and the efficiency rating of the basic model must be determined, such that,

(1) Any represented value of energy efficiency is no greater than the lower of the mean of the sample, or the lower 95 percent confidence limit of the true mean divided by 0.95, and

(2) Any represented value of energy usage is no less than the greater of the mean of the sample, or the upper 95 percent confidence limit of the true mean divided by 1.05.

(b) *Alternative efficiency determination methods.* Before using an AEDM to determine the efficiency of a basic model pursuant to this subpart, you must first:

(1) Apply the AEDM to three or more basic models that have been tested in accordance with §§ 431.173(b) and 431.175(a) of this subpart. The predicted efficiency calculated for each such basic model from application of the AEDM must be within three percent of the efficiency determined from testing that basic model, and the predicted efficiencies calculated for the tested basic models must on average be within one percent of the efficiencies determined from testing such basic models; and

(2) Obtain from the Department approval of the AEDM. The Department will provide such approval after receiving from you documentation which establishes that the AEDM satisfies the requirements of §§ 431.173(c)(1) and 431.175(b)(1) of this subpart.

(3) *Validation of an AEDM.* To use an AEDM under this subpart, the manufacturer must validate it as follows:

(i) Using the AEDM, the manufacturer must calculate the efficiency of three or more of its basic models. They must be the manufacturer's highest-selling basic models to which the AEDM could apply.

(ii) The manufacturer must test each of these basic models in accordance with § 431.173(b) of this subpart, and either §§ 431.174(b) or 431.175(a), whichever is applicable.

(iii) The predicted efficiency calculated for each such basic model from application of the AEDM must be within three percent of the efficiency determined from testing that basic model, and the average of the predicted efficiencies calculated for the tested basic models must be within one percent of the average of the efficiencies determined from testing these basic models.

(4) *Limitation on use of an AEDM.* A manufacturer may not use an AEDM to overrate the efficiency of a basic model.

§ 431.176 Voluntary Independent Certification Programs.

(a) The Department will approve a Voluntary Independent Certification Program (VICP) for a commercial HVAC and WH product if the VICP meets all of the following criteria:

(1) The program publishes its operating procedures in written form, and permits participation by all manufacturers of products covered by the program so long as they comply with the VICP's requirements concerning operation of the program.

(2) The program requires each participant to report to the program the efficiency of each basic model that the participant manufactures and that is covered by the program. The participant must determine such efficiency based on measurement of the basic model's performance.

(3) The program publishes the efficiency ratings received from each participant, or otherwise makes the ratings readily available to the general public and to the Department.

(4) The program conducts periodic verification testing on listed equipment, by testing the efficiency of each basic model at least once every five years and comparing its rated efficiency to the test results.

(5) An independent laboratory conducts the tests, or independent laboratory personnel supervise the tests.

(6) For verification testing, the testing personnel select units randomly from the manufacturer's stock.

(7) The program uses efficiency testing in accordance with the applicable Department test procedures.

(8) The program's verification testing meets industry standards for the accuracy of testing and of rating results for the equipment being tested, and the program satisfactorily describes how it meets these standards.

(9) The program has a standard for determining whether the efficiency rating a manufacturer claims for a product is valid.

(10) The program requires that, if a basic model fails verification testing conducted by the VICP, the manufacturer of the basic model must remove it from production and sale if the verification testing results show it is not in compliance with EPCA efficiency standards, or correctly re-rate it if it complies with such standards. The program must also provide that a participating manufacturer will be expelled from the VICP if it does not comply with such requirements, and that the VICP will report to the Department certification test results that find the performance of a basic model not to meet EPCA efficiency standards. (A basic model "fails" verification testing when the VICP has compared the basic model's efficiency rating resulting from completion of that testing with the efficiency rating claimed by the manufacturer, and has determined that the rating claimed by the manufacturer is not valid.)

(11) The program provides for penalties or other incentives to encourage manufacturers to report accurate and reliable efficiency ratings.

(12) The program provides to the manufacturer copies of all records of completed verification testing performed on the manufacturer's equipment covered by the program.

(13) The VICP makes available for DOE review, data on the results of its verification testing, including the following for each basic model on which the VICP has performed verification testing:

(i) The measured efficiency from the verification testing,

(ii) The manufacturer's efficiency rating, and

(iii) Either the applicable energy conservation standard or a description of the model sufficient to enable the Department to determine such standard.

(14) The program contains provisions under which each participating manufacturer can challenge ratings submitted by other manufacturers, which it believes to be in error.

(b) If the organization operating an approved VICP makes any changes in its program, the organization must notify the Department of such changes within 30 days of their occurrence, and the Department may then rescind or continue its approval.

Subpart K—Distribution Transformers

SOURCE: 70 FR 60416, Oct. 18, 2005, unless otherwise noted.

§ 431.191 Purpose and scope.

This subpart contains energy conservation requirements for distribution transformers, pursuant to Parts B and C of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6291–6317.

[71 FR 24995, Apr. 27, 2006]

§ 431.192 Definitions.

The following definitions apply for purposes of this subpart:

Autotransformer means a transformer that:

(1) Has one physical winding that consists of a series winding part and a common winding part;

(2) Has no isolation between its primary and secondary circuits; and

(3) During step-down operation, has a primary voltage that is equal to the total of the series and common winding voltages, and a secondary voltage that is equal to the common winding voltage.

Basic model means a group of models of distribution transformers manufactured by a single manufacturer, that have the same insulation type (*i.e.*, liquid-immersed or dry-type), have the same number of phases (*i.e.*, single or three), have the same standard kVA rating, and do not have any differentiating electrical, physical or functional features that affect energy consumption. Differences in voltage and differences in basic impulse insulation level (BIL) rating are examples of differentiating electrical features that affect energy consumption.

Distribution transformer means a transformer that—

(1) Has an input voltage of 34.5 kV or less;

(2) Has an output voltage of 600 V or less;

(3) Is rated for operation at a frequency of 60 Hz; and

(4) Has a capacity of 10 kVA to 2500 kVA for liquid-immersed units and 15 kVA to 2500 kVA for dry-type units; but

(5) The term "distribution transformer" does not include a transformer that is an—

(i) Autotransformer;

(ii) Drive (isolation) transformer;

(iii) Grounding transformer;

(iv) Machine-tool (control) transformer;

(v) Nonventilated transformer;

(vi) Rectifier transformer;

(vii) Regulating transformer;

(viii) Sealed transformer;

(ix) Special-impedance transformer;

(x) Testing transformer;

(xi) Transformer with tap range of 20 percent or more;

(xii) Uninterruptible power supply transformer; or

(xiii) Welding transformer.

Drive (isolation) transformer means a transformer that:

(1) Isolates an electric motor from the line;

(2) Accommodates the added loads of drive-created harmonics; and

(3) Is designed to withstand the additional mechanical stresses resulting from an alternating current adjustable frequency motor drive or a direct current motor drive.

Efficiency means the ratio of the useful power output to the total power input.

Excitation current or *no-load current* means the current that flows in any winding used to excite the transformer when all other windings are open-circuited.

Grounding transformer means a three-phase transformer intended primarily to provide a neutral point for system-grounding purposes, either by means of:

(1) A grounded wye primary winding and a delta secondary winding; or

(2) A transformer with its primary winding in a zig-zag winding arrangement, and with no secondary winding.

Liquid-immersed distribution transformer means a distribution transformer in which the core and coil assembly is immersed in an insulating liquid.

Load loss means, for a distribution transformer, those losses incident to a specified load carried by the transformer, including losses in the windings as well as stray losses in the conducting parts of the transformer.

Low-voltage dry-type distribution transformer means a distribution transformer that—

(1) Has an input voltage of 600 volts or less;

(2) Is air-cooled; and

(3) Does not use oil as a coolant.

Machine-tool (control) transformer means a transformer that is equipped with a fuse or other over-current protection device, and is generally used for the operation of a solenoid, contactor, relay, portable tool, or localized lighting.

Medium-voltage dry-type distribution transformer means a distribution transformer in which the core and coil assembly is immersed in a gaseous or dry-compound insulating medium, and which has a rated primary voltage between 601 V and 34.5 kV.

No-load loss means those losses that are incident to the excitation of the transformer.

Nonventilated transformer means a transformer constructed so as to prevent external air circulation through the coils of the transformer while operating at zero gauge pressure.

Phase angle means the angle between two phasors, where the two phasors represent progressions of periodic waves of either:

(1) Two voltages;

(2) Two currents; or

(3) A voltage and a current of an alternating current circuit.

Phase angle correction means the adjustment (correction) of measurement data to negate the effects of phase angle error.

Phase angle error means incorrect displacement of the phase angle, introduced by the components of the test equipment.

Rectifier transformer means a transformer that operates at the fundamental frequency of an alternating-current system and that is designed to have one or more output windings connected to a rectifier.

Reference temperature means 20 °C for no-load loss, 55 °C for load loss of liquid-immersed distribution transformers at 50 percent load, and 75 °C for load loss of both low-voltage and medium-voltage dry-type distribution transformers, at 35 percent load and 50 percent load, respectively. It is the temperature at which the transformer losses must be determined, and to which such losses must be corrected if testing is done at a different point. (These temperatures are specified in the test method in Appendix A to this part.)

Regulating transformer means a transformer that varies the voltage, the phase angle, or both voltage and phase angle, of an output circuit and compensates for fluctuation of load and input voltage, phase angle or both voltage and phase angle.

Sealed transformer means a transformer designed to remain hermetically sealed under specified conditions of temperature and pressure.

Special-impedance transformer means any transformer built to operate at an impedance outside of the normal impedance range for that transformer's kVA rating. The normal impedance range for each kVA rating for liquid-immersed and dry-type transformers is shown in Tables 1 and 2, respectively.

TABLE 1—NORMAL IMPEDANCE RANGES FOR LIQUID-IMMERSED TRANSFORMERS

Single-phase transformers		Three-phase transformers	
kVA	Impedance (%)	kVA	Impedance (%)
10	1.0–4.5	15	1.0–4.5
15	1.0–4.5	30	1.0–4.5
25	1.0–4.5	45	1.0–4.5
37.5	1.0–4.5	75	1.0–5.0
50	1.5–4.5	112.5	1.2–6.0
75	1.5–4.5	150	1.2–6.0
100	1.5–4.5	225	1.2–6.0
167	1.5–4.5	300	1.2–6.0
250	1.5–6.0	500	1.5–7.0
333	1.5–6.0	750	5.0–7.5
500	1.5–7.0	1000	5.0–7.5
667	5.0–7.5	1500	5.0–7.5
833	5.0–7.5	2000	5.0–7.5
		2500	5.0–7.5

TABLE 2—NORMAL IMPEDANCE RANGES FOR DRY-TYPE TRANSFORMERS

Single-phase transformers		Three-phase transformers	
kVA	Impedance (%)	kVA	Impedance (%)
15	1.5–6.0	15	1.5–6.0
25	1.5–6.0	30	1.5–6.0
37.5	1.5–6.0	45	1.5–6.0
50	1.5–6.0	75	1.5–6.0
75	2.0–7.0	112.5	1.5–6.0
100	2.0–7.0	150	1.5–6.0
167	2.5–8.0	225	3.0–7.0
250	3.5–8.0	300	3.0–7.0
333	3.5–8.0	500	4.5–8.0
500	3.5–8.0	750	5.0–8.0
667	5.0–8.0	1000	5.0–8.0
833	5.0–8.0	1500	5.0–8.0
		2000	5.0–8.0
		2500	5.0–8.0

Temperature correction means the mathematical correction(s) of measurement data, obtained when a transformer is tested at a temperature that is different from the reference temperature, to the value(s) that would have been obtained if the transformer had been tested at the reference temperature.

Test current means the current of the electrical power supplied to the transformer under test.

Test frequency means the frequency of the electrical power supplied to the transformer under test.

Test voltage means the voltage of the electrical power supplied to the transformer under test.

Testing transformer means a transformer used in a circuit to produce a specific voltage or current for the purpose of testing electrical equipment.

Total loss means the sum of the no-load loss and the load loss for a transformer.

Transformer means a device consisting of 2 or more coils of insulated wire that transfers alternating current by electromagnetic induction from 1 coil to another to change the original voltage or current value.

Transformer with tap range of 20 percent or more means a transformer with multiple voltage taps, the highest of which equals at least 20 percent more than the lowest, computed based on the sum of the deviations of the voltages of these taps from the transformer's nominal voltage.

Underground mining distribution transformer means a medium-voltage dry-type distribution transformer that is built only for installation in an underground mine or inside equipment for use in an underground mine, and that has a nameplate which identifies the transformer as being for this use only.

Uninterruptible power supply transformer means a transformer that is used within an uninterruptible power system, which in turn supplies power to loads that are sensitive to power failure, power sags, over voltage, switching transients, line noise, and other power quality factors.

Waveform correction means the adjustment(s) (mathematical correction(s)) of measurement data obtained with a test voltage that is non-sinusoidal, to a value(s) that would have been obtained with a sinusoidal voltage.

Welding transformer means a transformer designed for use in arc welding equipment or resistance welding equipment.

[70 FR 60416, Oct. 18, 2005, as amended at 71 FR 24995, Apr. 27, 2006; 71 FR 60662, Oct. 16, 2006; 72 FR 58239, Oct. 12, 2007]

TEST PROCEDURES

§ 431.193 Test procedures for measuring energy consumption of distribution transformers.

The test procedures for measuring the energy efficiency of distribution transformers for purposes of EPCA are specified in Appendix A to this subpart.

[71 FR 24997, Apr. 27, 2006]

ENERGY CONSERVATION STANDARDS

§ 431.196 Energy conservation standards and their effective dates.

(a) *Low-Voltage Dry-Type Distribution Transformers.* The efficiency of a low-voltage dry-type distribution transformer manufactured on or after January 1, 2007, shall be no less than that required for their kVA rating in the table below. Low-voltage dry-type distribution transformers with kVA ratings not appearing in the table shall have their minimum efficiency level determined by linear interpolation of the kVA and efficiency values immediately above and below that kVA rating.

Single phase		Three phase	
kVA	Efficiency (%) [1]	kVA	Efficiency (%) [1]
15	97.7	15	97.0
25	98.0	30	97.5
37.5	98.2	45	97.7
50	98.3	75	98.0
75	98.5	112.5	98.2
100	98.6	150	98.3
167	98.7	225	98.5
250	98.8	300	98.6
333	98.9	500	98.7
		750	98.8
		1000	98.9

[1] Efficiencies are determined at the following reference conditions: (1) for no-load losses, at the temperature of 20 °C, and (2) for load-losses, at the temperature of 75 °C and 35 percent of nameplate load.

(Source: Table 4–2 of National Electrical Manufacturers Association (NEMA) Standard TP–1–2002, "Guide for Determining Energy Efficiency for Distribution Transformers.")

(b) *Liquid-Immersed Distribution Transformers.* The efficiency of a liquid-immersed distribution transformer manufactured on or after January 1, 2010, shall be no less than that required for their kVA rating in the table below. Liquid-immersed distribution transformers with kVA ratings not appearing in the table shall have their minimum efficiency level determined by linear interpolation of the kVA and efficiency values immediately above and below that kVA rating.

Single-phase		Three-phase	
kVA	Efficiency (%)	kVA	Efficiency (%)
10	98.62	15	98.36
15	98.76	30	98.62
25	98.91	45	98.76
37.5	99.01	75	98.91
50	99.08	112.5	99.01
75	99.17	150	99.08
100	99.23	225	99.17
167	99.25	300	99.23
250	99.32	500	99.25
333	99.36	750	99.32
500	99.42	1000	99.36
667	99.46	1500	99.42
833	99.49	2000	99.46
	2500	99.49.	

Note: All efficiency values are at 50 percent of nameplate-rated load, determined according to the DOE Test-Procedure. 10 CFR Part 431, Subpart K, Appendix A.

(c) *Medium-Voltage Dry-Type Distribution Transformers.* The efficiency of a medium-voltage dry-type distribution transformer manufactured on or after January 1, 2010, shall be no less than that required for their kVA and BIL rating in the table below. Medium-voltage dry-type distribution transformers with kVA ratings not appearing in the table shall have their minimum efficiency level determined by linear interpolation of the kVA and efficiency values immediately above and below that kVA rating.

TABLE I.2—STANDARD LEVELS FOR MEDIUM-VOLTAGE, DRY-TYPE DISTRIBUTION TRANSFORMERS, TABULAR FORM

Single-phase				Three-phase			
BIL kVA	20–45 kV efficiency (%)	46–95 kV efficiency (%)	≥96 kV efficiency (%)	BIL kVA	20–45 kV efficiency (%)	46–95 kV efficiency (%)	≥96 kV efficiency (%)
15	98.10	97.86		15	97.50	97.18	
25	98.33	98.12		30	97.90	97.63	
37.5	98.49	98.30		45	98.10	97.86	
50	98.60	98.42		75	98.33	98.12	
75	98.73	98.57	98.53	112.5	98.49	98.30	
100	98.82	98.67	98.63	150	98.60	98.42	
167	98.96	98.83	98.80	225	98.73	98.57	98.53
250	99.07	98.95	98.91	300	98.82	98.67	98.63
333	99.14	99.03	98.99	500	98.96	98.83	98.80
500	99.22	99.12	99.09	750	99.07	98.95	98.91
667	99.27	99.18	99.15	1000	99.14	99.03	98.99
833	99.31	99.23	99.20	1500	99.22	99.12	99.09
				2000	99.27	99.18	99.15
				2500	99.31	99.23	99.20

Note: BIL means basic impulse insulation level.
Note: All efficiency values are at 50 percent of nameplate rated load, determined according to the DOE Test-Procedure. 10 CFR Part 431, Subpart K, Appendix A.

(d) *Underground Mining Distribution Transformers.* [Reserved]

[70 FR 60416, Oct. 18, 2005, as amended at 71 FR 24997, Apr. 27, 2006; 72 FR 58239, Oct. 12, 2007]

COMPLIANCE AND ENFORCEMENT

SOURCE: 71 FR 24997, Apr. 27, 2006, unless otherwise noted.

§ 431.197 Manufacturer's determination of efficiency for distribution transformers.

When a manufacturer or other party (both of which this section refers to as a "manufacturer") determines the efficiency of a distribution transformer 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. 6311–6317, this section applies. This section does not apply to enforcement testing conducted pursuant to § 431.198 of this part.

(a) *Methods used to determine efficiency*—(1) *General requirements.* A manufacturer must determine the efficiency of each basic model of distribution transformer either by testing, in accordance with § 431.193 of this part and paragraphs (b)(2) and (b)(3) of this section, or by application of an alternative efficiency determination method (AEDM) that meets the requirements of paragraphs (a)(2) and (a)(3) of this section; provided, however, that 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 (b)(1) of this section) through actual testing. For each basic model of distribution transformer that has a configuration of windings which allows for more than one nominal rated voltage, the manufacturer must determine the basic model's efficiency either at the voltage at which the highest losses occur or at each voltage at which the transformer is rated to operate.

(2) *Alternative efficiency determination method.* A manufacturer may apply an AEDM to a basic model pursuant to paragraph (a)(1) of this section only if:

(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 (a)(3) 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.

(3) *Substantiation of an alternative efficiency determination method.* 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 (b)(1) 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 paragraph (b)(2) of this section, 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 (a)(3)(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 (a)(3)(ii) of this section; and

(iv) Calculate for each of these basic models the percentage that its power loss calculated pursuant to paragraph (a)(3)(i) is of its power loss determined from testing pursuant to paragraph (a)(3)(ii), 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.

(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:

The method or methods used; 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; complete test data, product information, and related information that the manufacturer has generated or acquired pursuant to paragraph (a)(3) of this section; and 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 shall conduct simulations to predict the performance of particular basic models of distribution transformers specified by the Department, analyses of previous simulations conducted by the manufacturer, sample testing of basic models selected by the Department, or a combination of the foregoing.

(b) *Additional testing requirements*—(1) *Selection of basic models for testing if an AEDM is to be applied.* (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.

(2) *Selection of units for testing within a basic model.* For each basic model a manufacturer selects for testing, it shall select and test units as follows:

(i) If the manufacturer would produce five or fewer units of a basic model over a reasonable period of time (approximately 180 days), then it must test each unit. However, a manufacturer may not use a basic model with a sample size of fewer than five units to substantiate an AEDM pursuant to paragraph (a)(3) of this section.

(ii) If the manufacturer produces more than five units over such period of time, it must either test all such units or select a sample of at least five units at random and test them. Any such sample shall be comprised of production units of the basic model, or units that are representative of such production units.

(3) *Applying results of testing.* In a test of compliance with a represented efficiency, the average efficiency of the sample, $\bar{X}$, which is defined by

$$\bar{X} = \frac{1}{n}\sum_{i=1}^{n} X_i$$

where X_i is the measured efficiency of unit i and n is the number of units tested, must satisfy the condition:

$$\bar{X} \geq \frac{100}{1+\left(1+\frac{0.08}{\sqrt{n}}\right)\left(\frac{100}{RE}-1\right)}$$

where RE is the represented efficiency.

[71 FR 24997, Apr. 27, 2006]

EFFECTIVE DATE NOTE: At 71 FR 24997, Apr. 27, 2006, § 431.197 was added, effective May 30, 2006, except for paragraph (a)(4)(i) which contains information collection requirements and will not become effective until approval has been given by the Office of Management and Budget.

§ 431.198 Enforcement testing for distribution transformers.

(a) *Test notice.* Upon receiving information in writing, concerning the energy performance of a particular distribution transformer sold by a particular manufacturer or private labeler, which indicates that the transformer may not be in compliance with the applicable energy efficiency standard, or upon undertaking to ascertain the accuracy of the efficiency rating on

[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.

the nameplate or in marketing materials for a distribution transformer, disclosed pursuant to this part, the Department may conduct testing of that equipment under this subpart by means of a test notice addressed to the manufacturer in accordance with the following requirements:

(1) The test notice procedure will only be followed after the Department has examined the underlying test data (or, where appropriate, data as to use of an AEDM) provided by the manufacturer and after the manufacturer has been offered the opportunity to meet with the Department to verify, as applicable, compliance with the applicable efficiency standard, or the accuracy of labeling information, or both. In addition, where compliance of a basic model was certified based on an AEDM, the Department shall have the discretion to pursue the provisions of § 431.197(a)(4)(ii) prior to invoking the test notice procedure. The Department shall be permitted to observe any reverification procedures undertaken pursuant to this subpart, and to inspect the results of such reverification.

(2) The Department will mail or deliver the test notice to the plant manager or other responsible official, as designated by the manufacturer.

(3) The test notice will specify the basic model(s) to be selected for testing, the method of selecting the test sample, the date and time at which testing shall be initiated, the date by which testing is scheduled to be completed and the facility at which testing will be conducted. The test notice may also provide for situations in which a specified basic model is unavailable for testing, and may include alternative basic models. The specified basic model may be one either that the manufacturer has rated by actual testing or that it has rated by the use of an AEDM.

(4) The Department may require in the test notice that the manufacturer shall ship at its expense a reasonable number of units of each basic model specified in such test notice to a testing laboratory designated by the Department. The number of units of each basic model specified in a test notice shall not exceed twenty (20).

(5) Except as required or provided in paragraphs (a)(6) or (a)(7) of this section, initially the Department will test five units.

(6) Except as provided in paragraph (a)(7) of this section, 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 six months, 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 twenty); or

(B) Up to twenty of the other units that subsequently become available.

(7) Notwithstanding paragraphs (a)(5) and (a)(6) of this section, if testing of the available or subsequently available units of a basic model would be impractical, as for example where a basic model is very large, has unusual testing requirements, or has limited production, the Department may in its discretion decide to base the determination of compliance on the testing of fewer than the available number of units, if the manufacturer so requests and demonstrates that the criteria of this paragraph are met.

(8) When testing units under paragraphs (a)(5), (a)(6), or (a)(7) of this section, DOE shall perform the following number of tests:

(i) If DOE tests four or more units, it will test each unit once;

(ii) If DOE tests two or three units, it will test each unit twice; or

(iii) If DOE tests one unit, it will test that unit four times.

(9) Within five working days of the time the units are selected, the manufacturer shall ship the specified test units of the basic model to the testing laboratory.

(b) *Testing laboratory.* Whenever the Department conducts enforcement testing at a designated laboratory in accordance with a test notice under this section, the resulting test data shall constitute official test data for that basic model. Such test data will be used by the Department to make a

determination of compliance or noncompliance.

(c) *Sampling.* The determination that a manufacturer's basic model complies with its labeled efficiency, or the applicable energy efficiency standard, shall be based on the testing conducted in accordance with the statistical sampling procedures set forth in Appendix B of this subpart and the test procedures specified for distribution transformers.

(d) *Test unit selection.* The Department shall select a batch, a batch sample, and test units from the batch sample in accordance with the following provisions of this paragraph and the conditions specified in the test notice.

(1) The batch may be subdivided by the Department utilizing criteria specified in the test notice.

(2) The Department will then randomly select a batch sample of up to 20 units from one or more subdivided groups within the batch. The manufacturer shall keep on hand all units in the batch sample until such time as the basic model is determined to be in compliance or non-compliance.

(3) The Department will randomly select individual test units comprising the test sample from the batch sample.

(4) All random selection shall be achieved by sequentially numbering all of the units in a batch sample and then using a table of random numbers to select the units to be tested.

(e) *Test unit preparation.* (1) Prior to and during the testing, a test unit selected in accordance with paragraph (d) of this section shall not be prepared, modified, or adjusted in any manner unless such preparation, modification, or adjustment is allowed by the applicable Department of Energy test procedure.

(2) No quality control, testing, or assembly procedures shall be performed on a test unit, or any parts and sub-assemblies 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 the Department. The Department shall authorize testing of an additional unit on a case-by-case basis.

(f) *Testing at manufacturer's option.* (1) If a manufacturer's basic model is determined to be in noncompliance with the applicable energy performance standard at the conclusion of Department testing in accordance with the sampling plan specified in Appendix B of this subpart, the manufacturer may request that the Department conduct additional testing of the basic model according to procedures set forth in Appendix B of this subpart and the test procedures specified for distribution transformers.

(2) All units tested under this paragraph (f) shall be selected and tested in accordance with the provisions given in paragraphs (a)(9), (b), (d) and (e) of this section.

(3) The manufacturer shall bear the cost of all testing conducted under this paragraph (f).

(4) The manufacturer shall cease distribution of the basic model tested under the provisions of this paragraph from the time the manufacturer elects to exercise the option provided in this paragraph until the basic model is determined to be in compliance. The Department may seek civil penalties for all units distributed during such period.

(5) If the additional testing results in a determination of compliance, a notice of allowance to resume distribution shall be issued by the Department.

APPENDIX A TO SUBPART K OF PART 431—UNIFORM TEST METHOD FOR MEASURING THE ENERGY CONSUMPTION OF DISTRIBUTION TRANSFORMERS

1.0 DEFINITIONS.

The definitions contained in §§ 431.2 and 431.192 are applicable to this Appendix A.

2.0 ACCURACY REQUIREMENTS.

(a) Equipment and methods for loss measurement shall be sufficiently accurate that measurement error will be limited to the values shown in Table 2.1.

TABLE 2.1—TEST SYSTEM ACCURACY REQUIREMENTS FOR EACH MEASURED QUANTITY

Measured quantity	Test system accuracy
Power Losses	± 3.0%
Voltage	± 0.5%
Current	± 0.5%
Resistance	± 0.5%
Temperature	± 1.0 °C

(b) Only instrument transformers meeting the 0.3 metering accuracy class, or better, may be used under this test method.

3.0 RESISTANCE MEASUREMENTS

3.1 *General Considerations*

(a) Measure or establish the winding temperature at the time of the winding resistance measurement.

(b) Measure the direct current resistance (R_{dc}) of transformer windings by one of the methods outlined in section 3.3. The methods of section 3.5 must be used to correct load losses to the applicable reference temperature from the temperature at which they are measured. Observe precautions while taking measurements, such as those in section 3.4, in order to maintain measurement uncertainty limits specified in Table 2.1.

3.2 *Temperature Determination of Windings and Pre-conditions for Resistance Measurement.*

Make temperature measurements in protected areas where the air temperature is stable and there are no drafts. Determine the winding temperature (T_{dc}) for liquid-immersed and dry-type distribution transformers by the methods described in sections 3.2.1 and 3.2.2, respectively.

3.2.1 *Liquid-Immersed Distribution Transformers.*

3.2.1.1 *Methods*

Record the winding temperature (T_{dc}) of liquid-immersed transformers as the average of either of the following:

(a) The measurements from two temperature sensing devices (for example, thermocouples) applied to the outside of the transformer tank and thermally insulated from the surrounding environment, with one located at the level of the oil and the other located near the tank bottom or at the lower radiator header if applicable; or

(b) The measurements from two temperature sensing devices immersed in the transformer liquid, with one located directly above the winding and other located directly below the winding.

3.2.1.2 *Conditions*

Make this determination under either of the following conditions:

(a) The windings have been under insulating liquid with no excitation and no current in the windings for four hours before the dc resistance is measured; or

(b) The temperature of the insulating liquid has stabilized, and the difference between the top and bottom temperature does not exceed 5 °C.

3.2.2 *Dry-Type Distribution Transformers.*

Record the winding temperature (T_{dc}) of dry-type transformers as either of the following:

(a) For ventilated dry-type units, use the average of readings of four or more thermometers, thermocouples, or other suitable temperature sensors inserted within the coils. Place the sensing points of the measuring devices as close as possible to the winding conductors. For sealed units, such as epoxy-coated or epoxy-encapsulated units, use the average of four or more temperature sensors located on the enclosure and/or cover, as close to different parts of the winding assemblies as possible; or

(b) For both ventilated and sealed units, use the ambient temperature of the test area, under the following conditions:

(1) All internal temperatures measured by the internal temperature sensors must not differ from the test area ambient temperature by more than 2 °C.

(2) Enclosure surface temperatures for sealed units must not differ from the test area ambient temperature by more than 2 °C.

(3) Test area ambient temperature should not have changed by more than 3 °C for 3 hours before the test.

(4) Neither voltage nor current has been applied to the unit under test for 24 hours. In addition, increase this initial 24 hour period by any added amount of time necessary for the temperature of the transformer windings to stabilize at the level of the ambient temperature. However, this additional amount of time need not exceed 24 hours.

3.3 *Resistance Measurement Methods.*

Make resistance measurements using either the resistance bridge method, the voltmeter-ammeter method or a resistance meter. In each instance when this Uniform Test Method is used to test more than one unit of a basic model to determine the efficiency of that basic model, the resistance of the units being tested may be determined from making resistance measurements on only one of the units.

3.3.1 *Resistance Bridge Methods.*

If the resistance bridge method is selected, use either the Wheatstone or Kelvin bridge circuit (or the equivalent of either).

3.3.1.1 *Wheatstone Bridge*

(a) This bridge is best suited for measuring resistances larger than ten ohms. A schematic diagram of a Wheatstone bridge with a representative transformer under test is shown in Figure 3.1.

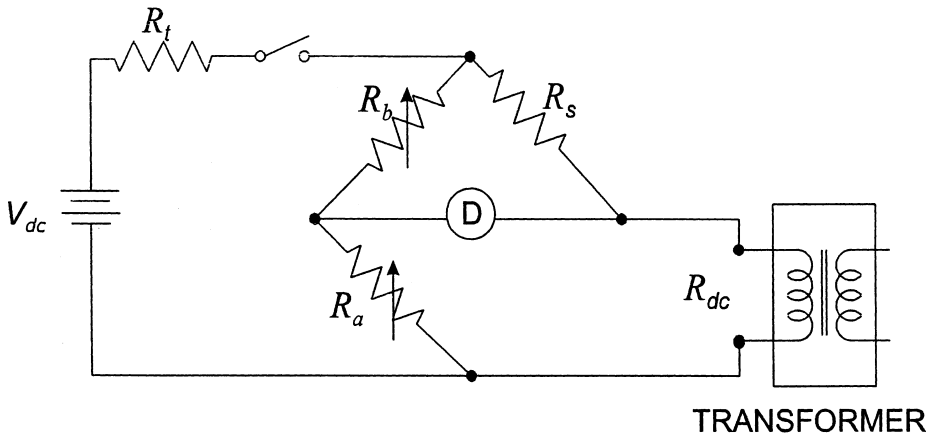

Figure 3.1 Wheatstone Bridge

Where:

R_{dc} is the resistance of the transformer winding being measured,

R_s is a standard resistor having the resistance R_s,

R_a, R_b are two precision resistors with resistance values R_a and R_b , respectively; at least one resistor must have a provision for resistance adjustment,

R_t is a resistor for reducing the time constant of the circuit,

D is a null detector, which may be either a micro ammeter or microvoltmeter or equivalent instrument for observing that no signal is present when the bridge is balanced, and

V_{dc} is a source of dc voltage for supplying the power to the Wheatstone Bridge.

(b) In the measurement process, turn on the source (V_{dc}), and adjust the resistance ratio (R_a/R_b) to produce zero signal at the detector (D). Determine the winding resistance by using equation 3–1 as follows:

$$R_{dc} = R_s \left(R_a / R_b \right) \qquad (3\text{-}1)$$

3.3.1.2 *Kelvin Bridge*

(a) This bridge separates the resistance of the connecting conductors to the transformer winding being measured from the resistance of the winding, and therefore is best suited for measuring resistances of ten ohms and smaller. A schematic diagram of a Kelvin bridge with a representative transformer under test is shown in Figure 3.2.

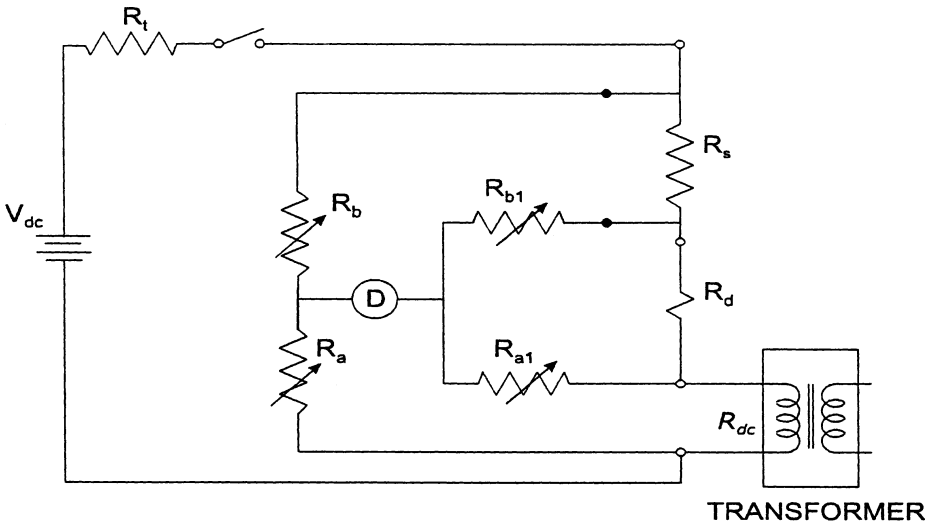

Figure 3.2 Kelvin Bridge

(b) The Kelvin Bridge has seven of the same type of components as in the Wheatstone Bridge. It has two more resistors than the Wheatstone bridge, R_{a1} and R_{b1}. At least one of these resistors must have adjustable resistance. In the measurement process, the source is turned on, two resistance ratios (R_a/R_b) and (R_{a1}/R_{b1}) are adjusted to be equal, and then the two ratios are adjusted together to balance the bridge producing zero signal at the detector. Determine the winding resistance by using equation 3–2 as follows:

$$R_{dc} = R_s\left(R_a/R_b\right) \qquad (3\text{-}2),$$

as with the Wheatstone bridge, with an additional condition that:

$$\left(R_a/R_b\right) = \left(R_{a1}/R_{b1}\right) \qquad (3\text{-}3)$$

(c) The Kelvin bridge provides two sets of leads, current-carrying and voltage-sensing, to the transformer terminals and the standard resistor, thus eliminating voltage drops from the measurement in the current-carrying leads as represented by R_d.

3.3.2 *Voltmeter-Ammeter Method.*

(a) Employ the voltmeter-ammeter method only if the rated current of the winding is greater than one ampere and the test current is limited to 15 percent of the winding current. Connect the transformer winding under test to the circuit shown in Figure 3.3.

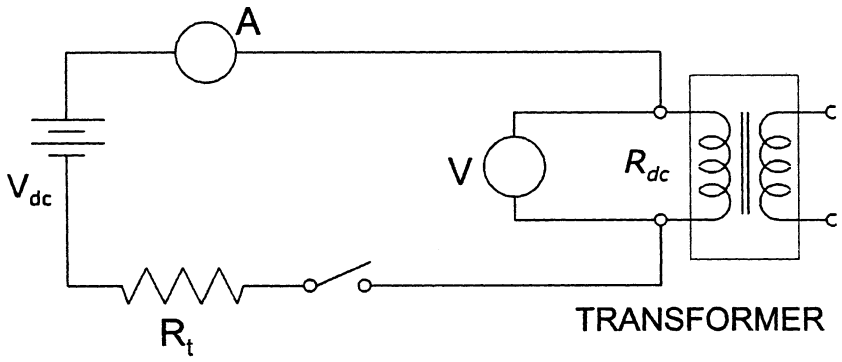

Figure 3.3 Voltmeter-Ammeter Method

Where:

A is an ammeter or a voltmeter-shunt combination for measuring the current (I_{mdc}) in the transformer winding,

V is a voltmeter with sensitivity in the millivolt range for measuring the voltage (V_{mdc}) applied to the transformer winding,

R_{dc} is the resistance of the transformer winding being measured,

R_t is a resistor for reducing the time constant of the circuit, and

V_{dc} is a source of dc voltage for supplying power to the measuring circuit.

(b) To perform the measurement, turn on the source to produce current no larger than 15 percent of the rated current for the winding. Wait until the current and voltage readings have stabilized and then take simultaneous readings of voltage and current. Determine the winding resistance R_{dc} by using equation 3–4 as follows:

$$R_{dc} = (V_{mdc}/I_{mdc}) \qquad (3\text{-}4)$$

Where:

V_{mdc} is the voltage measured by the voltmeter V, and

I_{mdc} is the current measured by the ammeter A.

(c) As shown in Figure 3.3, separate current and voltage leads must be brought to the transformer terminals. (This eliminates the errors due to lead and contact resistance.)

3.3.3 *Resistance Meters.*

Resistance meters may be based on voltmeter-ammeter, or resistance bridge, or some other operating principle. Any meter used to measure a transformer's winding resistance must have specifications for resistance range, current range, and ability to measure highly inductive resistors that cover the characteristics of the transformer being tested. Also the meter's specifications for accuracy must meet the applicable criteria of Table 2.1 in section 2.0.

3.4 *Precautions in Measuring Winding Resistance.*

3.4.1 *Required actions.*

The following guidelines must be observed when making resistance measurements:

(a) Use separate current and voltage leads when measuring small (< 10 ohms) resistance.

(b) Use null detectors in bridge circuits, and measuring instruments in voltmeter-ammeter circuits, that have sensitivity and resolution sufficient to enable observation of at least 0.1 percent change in the measured resistance.

(c) Maintain the dc test current at or below 15 percent of the rated winding current.

(d) Inclusion of a stabilizing resistor R_t (see section 3.4.2) will require higher source voltage.

(e) Disconnect the null detector (if a bridge circuit is used) and voltmeter from the circuit before the current is switched off, and switch off current by a suitable insulated switch.

3.4.2 *Guideline for Time Constant.*

(a) The following guideline is suggested for the tester as a means to facilitate the measurement of resistance in accordance with the accuracy requirements of section 2.0:

(b) The accurate reading of resistance R_{dc} may be facilitated by shortening the time constant. This is done by introducing a resistor R_t in series with the winding under test in both the bridge and voltmeter-ammeter circuits as shown in Figures 3.1 to 3.3. The relationship for the time constant is:

$$T_c = (L_{tc}/R_{tc}) \qquad (3\text{-}5)$$

Where:

T_c is the time constant in seconds,
L_{tc} is the total magnetizing and leakage inductance of the winding under test, in henries, and
R_{tc} is the total resistance in ohms, consisting of R_t in series with the winding resistance R_{dc} and the resistance R_s of the standard resistor in the bridge circuit.

(c) Because R_{tc} is in the denominator of the expression for the time constant, increasing the resistance R_{tc} will decrease the time constant. If the time constant in a given test circuit is too long for the resistance readings to be stable, then a higher resistance can be substituted for the existing R_{tc}, and successive replacements can be made until adequate stability is reached.

3.5 *Conversion of Resistance Measurements.*

(a) Resistance measurements must be corrected, from the temperature at which the winding resistance measurements were made, to the reference temperature. As specified in these test procedures, the reference temperature for liquid-immersed transformers loaded at 50 percent of the rated load is 55 °C. For medium-voltage, dry-type transformers loaded at 50 percent of the rated load, and for low-voltage, dry-type transformers loaded at 35 percent of the rated load, the reference temperature is 75 °C.

(b) Correct the measured resistance to the resistance at the reference temperature using equation 3–6 as follows:

$$R_{ts} = R_{dc}\left[\left(T_s + T_k\right)/\left(T_{dc} + T_k\right)\right] \qquad (3\text{-}6)$$

Where:

R_{ts} is the resistance at the reference temperature, T_s,
R_{dc} is the measured resistance at temperature, T_{dc},
T_s is the reference temperature in °C,
T_{dc} is the temperature at which resistance was measured in °C, and
T_k is 234.5 °C for copper or 225 °C for aluminum.

4.0 Loss Measurement

4.1 *General Considerations.*

The efficiency of a transformer is computed from the total transformer losses, which are determined from the measured value of the no-load loss and load loss power components. Each of these two power loss components is measured separately using test sets that are identical, except that shorting straps are added for the load-loss test. The measured quantities will need correction for instrumentation losses and may need corrections for known phase angle errors in measuring equipment and for the waveform distortion in the test voltage. Any power loss not measured at the applicable reference temperature must be adjusted to that reference temperature. The measured load loss must also be adjusted to a specified output loading level if not measured at the specified output loading level. Test distribution transformers designed for harmonic currents using a sinusoidal waveform (k=1).

4.2 *Measurement of Power Losses.*

4.2.1 *No-Load Loss.*

Measure the no-load loss and apply corrections as described in section 4.4, using the appropriate test set as described in section 4.3.

4.2.2 *Load Loss.*

Measure the load loss and apply corrections as described in section 4.5, using the appropriate test set as described in section 4.3.

4.3 *Test Sets.*

(a) The same test set may be used for both the no-load loss and load loss measurements provided the range of the test set encompasses the test requirements of both tests. Calibrate the test set to national standards to meet the tolerances in Table 2.1 in section 2.0. In addition, the wattmeter, current measuring system and voltage measuring system must be calibrated separately if the overall test set calibration is outside the tolerance as specified in section 2.0 or the individual phase angle error exceeds the values specified in section 4.5.3.

(b) A test set based on the wattmeter-voltmeter-ammeter principle may be used to measure the power loss and the applied voltage and current of a transformer where the transformer's test current and voltage are within the measurement capability of the measuring instruments. Current and voltage transformers, known collectively as instrument transformers, or other scaling devices such as resistive or capacitive dividers for voltage, may be used in the above circumstance, and must be used together with instruments to measure current, voltage, or power where the current or voltage of the transformer under test exceeds the measurement capability of such instruments. Thus, a test set may include a combination of measuring instruments and instrument transformers (or other scaling devices), so long as the current or voltage of the transformer under test does not exceed the measurement capability of any of the instruments.

4.3.1 *Single-Phase Test Sets.*

Use these for testing single-phase distribution transformers.

4.3.1.1 *Without Instrument Transformers.*

(a) A single-phase test set without an instrument transformer is shown in Figure 4.1.

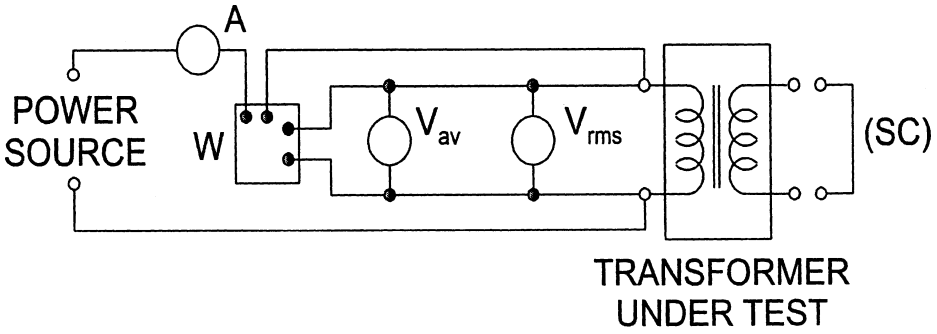

Figure 4.1 Single-Phase Test Set Without Instrument Transformers

Where:

W is a wattmeter used to measure P_{nm} and P_{lm}, the no-load and load loss power, respectively,

V_{rms} is a true root-mean-square (rms) voltmeter used to measure $V_{r(nm)}$ and V_{lm}, the rms test voltages in no-load and load loss measurements, respectively,

V_{av} is an average sensing voltmeter, calibrated to indicate rms voltage for sinusoidal waveforms and used to measure $V_{a(nm)}$, the average voltage in no-load loss measurements,

A is an rms ammeter used to measure test current, especially I_{lm}, the load loss current, and

(SC) is a conductor for providing a short-circuit across the output windings for the load loss measurements.

(b) Either the primary or the secondary winding can be connected to the test set. However, more compatible voltage and current levels for the measuring instruments are available if for no-load loss measurements the secondary (low voltage) winding is connected to the test set, and for load loss measurements the primary winding is connected to the test set. Use the average-sensing voltmeter, V_{av}, only in no-load loss measurements.

4.3.1.2 *With Instrument Transformers.*

A single-phase test set with instrument transformers is shown in Figure 4.2. This circuit has the same four measuring instruments as that in Figure 4.1. The current and voltage transformers, designated as (CT) and (VT), respectively, are added.

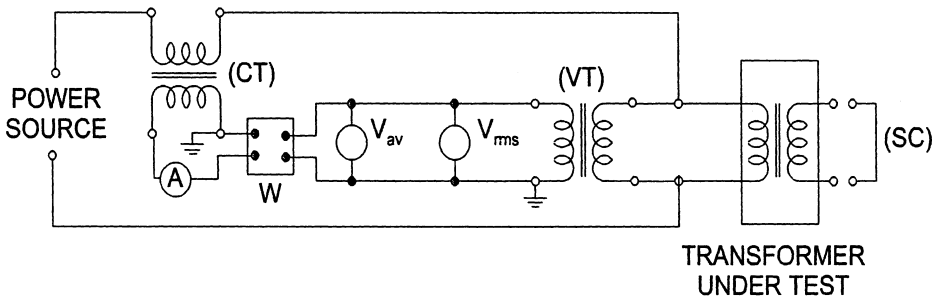

Figure 4.2 Single-Phase Test Set With Instrument Transformers

4.3.2 *Three-Phase Test Sets.*

Use these for testing three-phase distribution transformers. Use in a four-wire, three-wattmeter test circuit.

4.3.2.1 *Without Instrument Transformers.*

(a) A three-phase test set without instrument transformers is shown in Figure 4.3. This test set is essentially the same circuit

shown in Figure 4.1 repeated three times, and the instruments are individual devices as shown. As an alternative, the entire instrumentation system of a three-phase test set without transformers may consist of a multi-function analyzer.

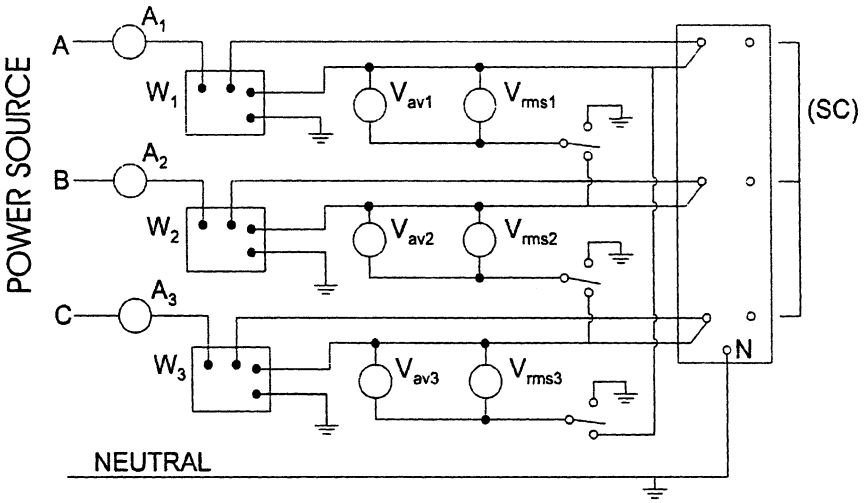

Figure 4.3 Three-Phase Test Set Without Instrument Transformers

(b) Either group of windings, the primary or the secondary, can be connected in wye or delta configuration. If both groups of windings are connected in the wye configuration for the no-load test, the neutral of the winding connected to the test set must be connected to the neutral of the source to provide a return path for the neutral current.

(c) In the no-load loss measurement, the voltage on the winding must be measured. Therefore a provision must be made to switch the voltmeters for line-to-neutral measurements for wye-connected windings and for line-to-line measurements for delta-connected windings.

4.3.2.2 *With Instrument Transformers.*

A three-phase test set with instrument transformers is shown in Figure 4.4. This test set is essentially the same circuit shown in Figure 4.2 repeated three times. Provision must be made to switch the voltmeters for line-to-neutral and line-to-line measurements as in section 4.3.2.1. The voltage sensors ("coils") of the wattmeters must always be connected in the line-to-neutral configuration.

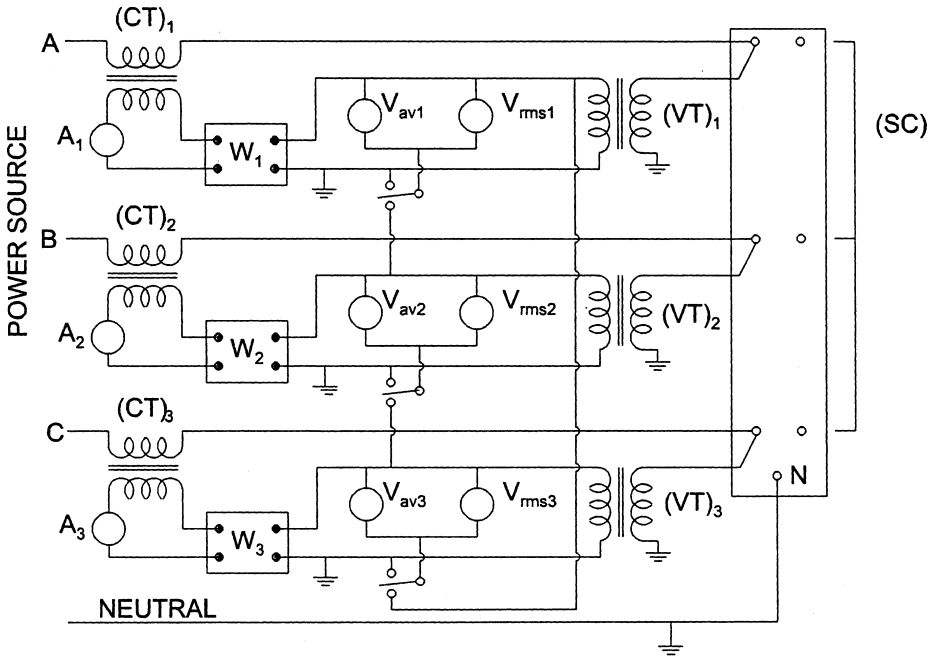

Figure 4.4 Three-Phase Test Set with Instrument Transformers

4.3.2.3 *Test Set Neutrals.*

If the power source in the test circuit is wye-connected, ground the neutral. If the power source in the test circuit is delta-connected, use a grounding transformer to obtain neutral and ground for the test.

4.4 *No-Load Losses: Measurement and Calculations.*

4.4.1 *General Considerations.*

Measurement corrections are permitted but not required for instrumentation losses and for losses from auxiliary devices. Measurement corrections are required:

(a) When the waveform of the applied voltage is non-sinusoidal; and

(b) When the core temperature or liquid temperature is outside the 20 °C ± 10 °C range.

4.4.2 *No-Load Loss Test.*

(a) The purpose of the no-load loss test is to measure no-load losses at a specified excitation voltage and a specified frequency. The no-load loss determination must be based on a sine-wave voltage corrected to the reference temperature. Connect either of the transformer windings, primary or secondary, to the appropriate test set of Figures 4.1 to 4.4, giving consideration to section 4.4.2(a)(2). Leave the unconnected winding(s) open circuited. Apply the rated voltage at rated frequency, as measured by the average-sensing voltmeter, to the transformer. Take the readings of the wattmeter(s) and the average-sensing and true rms voltmeters. Observe the following precautions:

(1) Voltmeter connections. When correcting to a sine-wave basis using the average-voltmeter method, the voltmeter connections must be such that the waveform applied to the voltmeters is the same as the waveform across the energized windings.

(2) Energized windings. Energize either the high voltage or the low voltage winding of the transformer under test.

(3) Voltage and frequency. The no-load loss test must be conducted with rated voltage impressed across the transformer terminals using a voltage source at a frequency equal to the rated frequency of the transformer under test.

(b) Adjust the voltage to the specified value as indicated by the average-sensing voltmeter. Record the values of rms voltage, rms current, electrical power, and average voltage as close to simultaneously as possible. For a three-phase transformer, take all of the readings on one phase before proceeding to the next, and record the average of the three rms voltmeter readings as the rms voltage value.

NOTE: When the tester uses a power supply that is not synchronized with an electric

utility grid, such as a dc/ac motor-generator set, check the frequency and maintain it within ±0.5 percent of the rated frequency of the transformer under test. A power source that is directly connected to, or synchronized with, an electric utility grid need not be monitored for frequency.

4.4.3 *Corrections.*

4.4.3.1 *Correction for Instrumentation Losses.*

Measured losses attributable to the voltmeters and wattmeter voltage circuit, and to voltage transformers if they are used, may be deducted from the total no-load losses measured during testing.

4.4.3.2 *Correction for Non-Sinusoidal Applied Voltage.*

(a) The measured value of no-load loss must be corrected to a sinusoidal voltage, except when waveform distortion in the test voltage causes the magnitude of the correction to be less than 1 percent. In such a case, no correction is required.

(b) To make a correction where the distortion requires a correction of 5 percent or less, use equation 4–1. If the distortion requires a correction to be greater than 5 percent, improve the test voltage and re-test. Repeat until the distortion requires a correction of 5 percent or less.

(c) Determine the no-load losses of the transformer corrected for sine-wave basis from the measured value by using equation 4–1 as follows:

$$P_{ncl} = \frac{P_{nm}}{P_1 + kP_2} \qquad (4\text{-}1)$$

Where:

P_{ncl} is the no-load loss corrected to a sine-wave basis at the temperature (T_{nm}) at which no-load loss is measured,

P_{nm} is the measured no-load loss at temperature T_{nm},

P_1 is the per unit hysteresis loss,

P_2 is the per unit eddy-current loss,

$P_1 + P_2 = 1$,

$$k = \left(\frac{V_{r(nm)}}{V_{a(nm)}} \right)^2 ,$$

$V_{r(nm)}$ is the test voltage measured by rms voltmeter, and

$V_{a(nm)}$ is the test voltage measured by average-voltage voltmeter.

(d) The two loss components (P_1 and P_2) are assumed equal in value, each assigned a value of 0.5 per unit, unless the actual measurement-based values of hysteresis and eddy-current losses are available (in per unit form), in which case the actual measurements apply.

4.4.3.3 *Correction of No-Load Loss to Reference Temperature.*

After correcting the measured no-load loss for waveform distortion, correct the loss to the reference temperature of 20 °C. If the no-load loss measurements were made between 10 °C and 30 °C, this correction is not required. If the correction to reference temperature is applied, then the core temperature of the transformer during no-load loss measurement (T_{nm}) must be determined within ± 10 °C of the true average core temperature. Correct the no-load loss to the reference temperature by using equation 4–2 as follows:

$$P_{nc} = P_{ncl}\left[1 + 0.00065\left(T_{nm} - T_{nr}\right)\right] \qquad (4\text{-}2)$$

Where:

P_{nc} is the no-load losses corrected for waveform distortion and then to the reference temperature of 20 °C,

P_{nc1} is the no-load losses, corrected for waveform distortion, at temperature T_{nm},

T_{nm} is the core temperature during the measurement of no-load losses, and

T_{nr} is the reference temperature, 20 °C.

4.5 *Load Losses: Measurement and Calculations.*

4.5.1 *General Considerations.*

(a) The load losses of a transformer are those losses incident to a specified load carried by the transformer. Load losses consist of ohmic loss in the windings due to the load current and stray losses due to the eddy currents induced by the leakage flux in the windings, core clamps, magnetic shields, tank walls, and other conducting parts. The ohmic loss of a transformer varies directly with temperature, whereas the stray losses vary inversely with temperature.

(b) For a transformer with a tap changer, conduct the test at the rated current and rated-voltage tap position. For a transformer that has a configuration of windings which allows for more than one nominal rated voltage, determine its load losses either in the winding configuration in which the highest losses occur or in each winding configuration in which the transformer can operate.

4.5.2 *Tests for Measuring Load Losses.*

(a) Connect the transformer with either the high-voltage or low-voltage windings to the appropriate test set. Then short-circuit the winding that was not connected to the test set. Apply a voltage at the rated frequency (of the transformer under test) to the connected windings to produce the rated current in the transformer. Take the readings of the wattmeter(s), the ammeters(s), and rms voltmeter(s).

(b) Regardless of the test set selected, the following preparatory requirements must be satisfied for accurate test results:

(1) Determine the temperature of the windings using the applicable method in section 3.2.1 or section 3.2.2.

(2) The conductors used to short-circuit the windings must have a cross-sectional area equal to, or greater than, the corresponding transformer leads, or, if the tester uses a different method to short-circuit the windings, the losses in the short-circuiting conductor assembly must be less than 10 percent of the transformer's load losses.

(3) When the tester uses a power supply that is not synchronized with an electric utility grid, such as a dc/ac motor-generator set, follow the provisions of the "Note" in section 4.4.2.

4.5.3 *Corrections.*

4.5.3.1 *Correction for Losses from Instrumentation and Auxiliary Devices.*

4.5.3.1.1 *Instrumentation Losses.*

Measured losses attributable to the voltmeters, wattmeter voltage circuit and short-circuiting conductor (SC), and to the voltage transformers if they are used, may be deducted from the total load losses measured during testing.

4.5.3.1.2 *Losses from Auxiliary Devices.*

Measured losses attributable to auxiliary devices (e.g., circuit breakers, fuses, switches) installed in the transformer, if any, that are not part of the winding and core assembly, may be excluded from load losses measured during testing. To exclude these losses, either (1) measure transformer losses without the auxiliary devices by removing or bypassing them, or (2) measure transformer losses with the auxiliary devices connected, determine the losses associated with the auxiliary devices, and deduct these losses from the load losses measured during testing.

4.5.3.2 *Correction for Phase Angle Errors.*

(a) Corrections for phase angle errors are not required if the instrumentation is calibrated over the entire range of power factors and phase angle errors. Otherwise, determine whether to correct for phase angle errors from the magnitude of the normalized per unit correction, β_n, obtained by using equation 4–3 as follows:

$$\beta_n = \frac{V_{lm} I_{lm} (\beta_w - \beta_v + \beta_c) \sin \phi}{p_{lm}} \qquad (4\text{-}3)$$

(b) The correction must be applied if β_n is outside the limits of ±0.01. If β_n is within the limits of ±0.01, the correction is permitted but not required.

(c) If the correction for phase angle errors is to be applied, first examine the total system phase angle ($\beta_w - \beta_v + \beta_c$). Where the total system phase angle is equal to or less than ±12 milliradians (±41 minutes), use either equation 4–4 or 4–5 to correct the measured load loss power for phase angle errors, and where the total system phase angle exceeds ±12 milliradians (±41 minutes) use equation 4–5, as follows:

$$P_{lcl} = P_{lm} - V_{lm} I_{lm} (\beta_w - \beta_v + \beta_c) \sin \phi \qquad (4\text{-}4)$$

$$P_{lcl} = V_{lm} I_{lm} \cos(\phi + \beta_w - \beta_v + \beta_c) \qquad (4\text{-}5)$$

(d) The symbols in this section (4.5.3.2) have the following meanings:

P_{lc1} is the corrected wattmeter reading for phase angle errors,

P_{lm} is the actual wattmeter reading,

V_{lm} is the measured voltage at the transformer winding,

I_{lm} is the measured rms current in the transformer winding,

$$\phi = \cos^{-1} \frac{P_{lm}}{V_{lm} I_{lm}}$$

is the measured phase angle between V_{lm} and I_{lm},

β_w is the phase angle error (in radians) of the wattmeter; the error is positive if the phase angle between the voltage and current phasors as sensed by the wattmeter is smaller than the true phase angle, thus effectively increasing the measured power,

β_v is the phase angle error (in radians) of the voltage transformer; the error is positive if the secondary voltage leads the primary voltage, and

β_c is the phase angle error (in radians) of the current transformer; the error is positive if the secondary current leads the primary current.

(e) The instrumentation phase angle errors used in the correction equations must be specific for the test conditions involved.

4.5.3.3 *Temperature Correction of Load Loss.*

(a) When the measurement of load loss is made at a temperature T_{lm} that is different from the reference temperature, use the procedure summarized in the equations 4–6 to 4–10 to correct the measured load loss to the reference temperature. The symbols used in these equations are defined at the end of this section.

(b) Calculate the ohmic loss (P_e) by using equation 4–6 as follows:

$$P_e = P_{e(p)} + P_{e(s)}$$
$$= I_{lm(p)}^2 R_{dc(p)} \frac{T_{k(p)} + T_{lm}}{T_{k(p)} + T_{dc}} + I_{lm(s)}^2 R_{dc(s)} \frac{T_{k(s)} + T_{lm}}{T_{k(s)} + T_{dc}}$$
$$= I_{lm(p)}^2 \left[R_{dc(p)} \frac{T_{k(p)} + T_{lm}}{T_{k(p)} + T_{dc}} + \left[\frac{N_1}{N_2} \right]^2 R_{dc(s)} \frac{T_{k(s)} + T_{lm}}{T_{k(s)} + T_{dc}} \right] \quad (4\text{-}6)$$

(c) Obtain the stray loss by subtracting the calculated ohmic loss from the measured load loss, by using equation 4–7 as follows:

$$P_s = P_{lc1} - P_e \quad (4\text{-}7)$$

(d) Correct the ohmic and stray losses to the reference temperature for the load loss by using equations 4–8 and 4–9, respectively, as follows:

$$P_{er} = P_{e(p)} \frac{T_{k(p)} + T_{lr}}{T_{k(p)} + T_{lm}} + P_{e(s)} \frac{T_{k(s)} + T_{lr}}{T_{k(s)} + T_{lm}}$$
$$= I_{lm(p)}^2 \left[R_{dc(p)} \frac{T_{k(p)} + T_{lr}}{T_{k(p)} + T_{dc}} + \left[\frac{N_1}{N_2} \right]^2 R_{dc(s)} \frac{T_{k(s)} + T_{lr}}{T_{k(s)} + T_{dc}} \right] \quad (4\text{-}8)$$

$$P_{sr} = (P_{lc1} - P_e) \frac{T_k + T_{lm}}{T_k + T_{lr}} \quad (4\text{-}9)$$

(e) Add the ohmic and stray losses, corrected to the reference temperature, to give the load loss, P_{lc2}, at the reference temperature, by using equation 4–10 as follows:

$$P_{lc2} = P_{er} + P_{sr}$$
$$= I_{lm(p)}^2 \left[R_{dc(p)} \frac{T_{k(p)} + T_{lr}}{T_{k(p)} + T_{dc}} + \left[\frac{N_1}{N_2} \right]^2 R_{dc(s)} \frac{T_{k(s)} + T_{lr}}{T_{k(s)} + T_{dc}} \right]$$
$$+ \left[P_{lc1} - I_{lm(p)}^2 \left[R_{dc(p)} \frac{T_{k(p)} + T_{lm}}{T_{k(p)} + T_{dc}} + \left[\frac{N_1}{N_2} \right]^2 R_{dc(s)} \frac{T_{k(s)} + T_{lm}}{T_{k(s)} + T_{dc}} \right] \right] \frac{T_k + T_{lm}}{T_k + T_{lr}} \quad (4\text{-}10)$$

(f) The symbols in this section (4.5.3.3) have the following meanings:

$I_{lm(p)}$ is the primary current in amperes,

$I_{lm(s)}$ is the secondary current in amperes,

P_e is the ohmic loss in the transformer in watts at the temperature T_{lm},

$P_{e(p)}$ is the ohmic loss in watts in the primary winding at the temperature T_{lm},

$P_{e(s)}$ is the ohmic loss in watts in the secondary winding at the temperature $T_{lm,}$
P_{er} is the ohmic loss in watts corrected to the reference temperature,
P_{lc1} is the measured load loss in watts, corrected for phase angle error, at the temperature $T_{lm,}$
P_{lc2} is the load loss at the reference temperature,
P_s is the stray loss in watts at the temperature $T_{lm,}$
P_{sr} is the stray loss in watts corrected to the reference temperature,
$R_{dc(p)}$ is the measured dc primary winding resistance in ohms,
$R_{dc(s)}$ is the measured dc secondary winding resistance in ohms,
T_k is the critical temperature in degrees Celsius for the material of the transformer windings. Where copper is used in both primary and secondary windings, T_k is 234.5 °C; where aluminum is used in both primary and secondary windings, T_k is 225 °C; where both copper and aluminum are used in the same transformer, the value of 229 °C is used for T_k,
$T_{k(p)}$ is the critical temperature in degrees Celsius for the material of the primary winding: 234.5 °C if copper and 225 °C if aluminum,
$T_{k(s)}$ is the critical temperature in degrees Celsius for the material of the secondary winding: 234.5 °C if copper and 225 °C if aluminum,
T_{lm} is the temperature in degrees Celsius at which the load loss is measured,
T_{lr} is the reference temperature for the load loss in degrees Celsius,
T_{dc} is the temperature in degrees Celsius at which the resistance values are measured, and
N_1/N_2 is the ratio of the number of turns in the primary winding (N_1) to the number of turns in the secondary winding (N_2); for a primary winding with taps, N_1 is the number of turns used when the voltage applied to the primary winding is the rated primary voltage.

5.0 Determining the Efficiency Value of the Transformer

This section presents the equations to use in determining the efficiency value of the transformer at the required reference conditions and at the specified loading level. The details of measurements are described in sections 3.0 and 4.0. For a transformer that has a configuration of windings which allows for more than one nominal rated voltage, determine its efficiency either at the voltage at which the highest losses occur or at each voltage at which the transformer is rated to operate.

5.1 *Output Loading Level Adjustment.*

If the output loading level for energy efficiency is different from the level at which the load loss power measurements were made, then adjust the corrected load loss power, P_{lc2}, by using equation 5–1 as follows:

$$P_{lc} = P_{lc2}\left[\frac{P_{os}}{P_{or}}\right]^2 = P_{lc2}L^2 \qquad (5\text{-}1)$$

Where:

P_{lc} is the adjusted load loss power to the specified energy efficiency load level,
P_{lc2} is as calculated in section 4.5.3.3,
P_{or} is the rated transformer apparent power (name plate),
P_{os} is the specified energy efficiency load level, where $P_{os} = P_{or}L$, and
L is the per unit load level, e.g., if the load level is 50 percent then "L" will be 0.5.

5.2 *Total Loss Power Calculation.*

Calculate the corrected total loss power by using equation 5–2 as follows:

$$P_{ts} = P_{nc} + P_{lc} \qquad (5\text{-}2)$$

Where:

P_{ts} is the corrected total loss power adjusted for the transformer output loading specified by the standard,
P_{nc} is as calculated in section 4.4.3.3, and
P_{lc} is as calculated in section 5.1.

5.3 *Energy Efficiency Calculation.*

Calculate efficiency (η) in percent at specified energy efficiency load level, P_{os}, by using equation 5–3 as follows:

$$\eta = 100\left(\frac{P_{os}}{P_{os} + P_{ts}}\right) \qquad (5\text{-}3)$$

Where:

P_{os} is as described and calculated in section 5.1, and
P_{ts} is as described and calculated in section 5.2.

5.4 *Significant Figures in Power Loss and Efficiency Data.*

In measured and calculated data, retain enough significant figures to provide at least 1 percent resolution in power loss data and 0.01 percent resolution in efficiency data.

6.0 Test Equipment Calibration and Certification

Maintain and calibrate test equipment and measuring instruments, maintain calibration records, and perform other test and measurement quality assurance procedures according to the following sections. The calibration of the test set must confirm the accuracy of the test set to that specified in section 2.0, Table 2.1.

6.1 *Test Equipment.*

The party performing the tests shall control, calibrate and maintain measuring and test equipment, whether or not it owns the

equipment, has the equipment on loan, or the equipment is provided by another party. Equipment shall be used in a manner which assures that measurement uncertainty is known and is consistent with the required measurement capability.

6.2 *Calibration and Certification.*

The party performing the tests must:

(a) Identify the measurements to be made, the accuracy required (section 2.0) and select the appropriate measurement and test equipment;

(b) At prescribed intervals, or prior to use, identify, check and calibrate, if needed, all measuring and test equipment systems or devices that affect test accuracy, against certified equipment having a known valid relationship to nationally recognized standards; where no such standards exist, the basis used for calibration must be documented;

(c) Establish, document and maintain calibration procedures, including details of equipment type, identification number, location, frequency of checks, check method, acceptance criteria and action to be taken when results are unsatisfactory;

(d) Ensure that the measuring and test equipment is capable of the accuracy and precision necessary, taking into account the voltage, current and power factor of the transformer under test;

(e) Identify measuring and test equipment with a suitable indicator or approved identification record to show the calibration status;

(f) Maintain calibration records for measuring and test equipment;

(g) Assess and document the validity of previous test results when measuring and test equipment is found to be out of calibration;

(h) Ensure that the environmental conditions are suitable for the calibrations, measurements and tests being carried out;

(i) Ensure that the handling, preservation and storage of measuring and test equipment is such that the accuracy and fitness for use is maintained; and

(j) Safeguard measuring and test facilities, including both test hardware and test software, from adjustments which would invalidate the calibration setting.

[71 FR 24999, Apr. 27, 2006, as amended at 71 FR 60662, Oct. 16, 2006]

EFFECTIVE DATE NOTE: At 71 FR 24999, Apr. 27, 2006, appendix A to subpart K of part 431 was added, effective May 30, 2006, except for section 6.2(f) and section 6.2 (b) and (c) which contain information collection requirements and will not become effective until approval has been given by the Office of Management and Budget.

APPENDIX B TO SUBPART K OF PART 431—SAMPLING PLAN FOR ENFORCEMENT TESTING

Step 1. The number of units in the sample (m_1) shall be in accordance with §§ 431.198(a)(4), 431.198(a)(5), 431.198(a)(6) and 431.198(a)(7) and shall not be greater than twenty. The number of tests in the first sample (n_1) shall be in accordance with § 431.198(a)(8) and shall be not fewer than four.

Step 2. Compute the mean ($\bar{X}_i$) of the measured energy performance of the n_1 tests in the first sample by using equation 1 as follows:

$$\bar{X}_1 = \frac{1}{n_1}\sum_{i=1}^{n_1} X_i \qquad (1)$$

where X_i is the measured efficiency of test i.

Step 3. Compute the sample standard deviation (S_1) of the measured efficiency of the n_1 tests in the first sample by using equation 2 as follows:

$$S_1 = \sqrt{\frac{\sum_{i=1}^{n_1}\left(X_i - \bar{X}_1\right)^2}{n_1 - 1}} \qquad (2)$$

Step 4. Compute the standard error ($SE(\bar{X}_1)$) of the mean efficiency of the first sample by using equation 3 as follows:

$$SE\left(\bar{X}_1\right) = \frac{S_1}{\sqrt{n_1}} \qquad (3)$$

Step 5. Compute the sample size discount ($SSD(m_1)$) by using equation 4 as follows:

$$SSD\left(m_1\right) = \frac{100}{1 + \left(1 + \frac{.08}{\sqrt{m_1}}\right)\left(\frac{100}{RE} - 1\right)} \qquad (4)$$

where m_1 is the number of units in the sample, and RE is the applicable EPCA efficiency when the test is to determine compliance with the applicable statutory standard, or is the labeled efficiency when the test is to determine compliance with the labeled efficiency value.

Step 6. Compute the lower control limit (LCL_1) for the mean of the first sample by using equation 5 as follows:

$$LCL_1 = SSD\left(m_1\right) - tSE\left(\bar{X}_1\right) \qquad (5)$$

where t is the 2.5th percentile of a t-distribution for a sample size of n_1, which yields a

97.5 percent confidence level for a one-tailed t-test.

Step 7. Compare the mean of the first sample ($\bar{X}_1$) with the lower control limit (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 non-compliance and testing is at an end.

(ii) If the mean is equal to or greater than the lower control limit, no final determination of compliance or non-compliance can be made; proceed to Step 8.

Step 8. Determine the recommended sample size (n) by using equation 6 as follows:

$$n = \left[\frac{tS_1(108 - 0.08RE)}{RE(8 - 0.08RE)}\right]^2 \qquad (6)$$

where S_1 and t have the values used in Steps 3 and 6, respectively. The factor

$$\frac{108 - 0.08RE}{RE(8 - 0.08RE)}$$

is based on an 8-percent tolerance in the total power loss.

Given the value of n, determine one of the following:

(i) If the value of n is less than or equal to n_1 and if the mean energy efficiency of the first sample ($\bar{X}_1$) is equal to or greater than the lower control limit (LCL_1), the basic model is in compliance and testing is at an end.

(ii) If the value of n is greater than n_1, and no additional units are available for testing, testing is at an end and the basic model is in non-compliance. If the value of n is greater than n_1, and additional units are available for testing, select a second sample n_2. The size of the n_2 sample is determined to be the smallest integer equal to or greater than the difference $n–n_1$. If the value of n_2 so calculated is greater than $20–n_1$, set n_2 equal to $20–n_1$.

Step 9. After testing the n_2 sample, compute the combined mean ($\bar{X}_2$) of the measured energy performance of the n_1 and n_2 tests of the combined first and second samples by using equation 7 as follows:

$$\bar{X}_2 = \frac{1}{n_1 + n_2}\sum_{i=1}^{n_1+n_2} X_i \qquad (7)$$

Step 10. Compute the standard error ($SE(\bar{X}_2)$) of the mean efficiency of the n_1 and n_2 tests in the combined first and second samples by using equation 8 as follows:

$$SE(\bar{X}_2) = \frac{S_1}{\sqrt{n_1 + n_2}} \qquad (8)$$

(Note that S_1 is the value obtained above in Step 3.)

Step 11. Set the lower control limit (LCL_2) to,

$$LCL_2 = SSD(m_1) - tSE(\bar{X}_2) \qquad (9)$$

where t has the value obtained in Step 5 and $SSD(m_1)$ is sample size discount from Step 5. Compare the combined sample mean ($\bar{X}_2$) to the lower control limit (LCL_2) to find one of the following:

(i) If the mean of the combined sample ($\bar{X}_2$) is less than the lower control limit (LCL_2), the basic model is in non-compliance and testing is at an end.

(ii) If the mean of the combined sample ($\bar{X}_2$) is equal to or greater than the lower control limit (LCL_2), the basic model is in compliance and testing is at an end.

MANUFACTURER-OPTION TESTING

If a determination of non-compliance is made in Steps 6, 7 or 11, above, the manufacturer may request that additional testing be conducted, in accordance with the following procedures.

Step A. The manufacturer requests that an additional number, n_3, of units be tested, with n_3 chosen such that $n_1+n_2+n_3$ does not exceed 20.

Step B. Compute the mean efficiency, standard error, and lower control limit of the new combined sample in accordance with the procedures prescribed in Steps 8, 9, and 10, above.

Step C. Compare the mean performance of the new combined sample to the lower control limit (LCL_2) to determine one of the following:

(a) If the new combined sample mean is equal to or greater than the lower control limit, the basic model is in compliance and testing is at an end.

(b) If the new combined sample mean is less than the lower control limit and the value of $n_1+n_2+n_3$ is less than 20, the manufacturer may request that additional units be tested. The total of all units tested may not exceed 20. Steps A, B, and C are then repeated.

(c) Otherwise, the basic model is determined to be in non-compliance.

[71 FR 24999, Apr. 27, 2006]

Subpart L—Illuminated Exit Signs

SOURCE: 70 FR 60417, Oct. 18, 2005, unless otherwise noted.

§ 431.201 Purpose and scope.

This subpart contains energy conservation requirements for illuminated exit signs, pursuant to Part B of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6291–6309.

§ 431.202 Definitions concerning illuminated exit signs.

Basic model means, with respect to illuminated exit signs, all units of a given type of illuminated exit sign (or class thereof) manufactured by one manufacturer and which have the same primary energy source, which have electrical characteristics that are essentially identical, and which do not have any differing electrical, physical, or functional characteristics that affect energy consumption.

Face means an illuminated side of an illuminated exit sign.

Illuminated exit sign means a sign that—

(1) Is designed to be permanently fixed in place to identify an exit; and

(2) Consists of an electrically powered integral light source that—

(i) Illuminates the legend "EXIT" and any directional indicators; and

(ii) Provides contrast between the legend, any directional indicators, and the background.

Input power demand means the amount of power required to continuously illuminate an exit sign model, measured in watts (W). For exit sign models with rechargeable batteries, input power demand shall be measured with batteries at full charge.

[70 FR 60417, Oct. 18, 2005, as amended at 71 FR 71372, Dec. 8, 2006]

TEST PROCEDURES

§ 431.203 Materials incorporated by reference.

(a) *General.* The Department incorporates by reference the following test procedures into subpart L of part 431. The Director of the Federal Register has approved the material listed in paragraph (b) of this section for incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Any subsequent amendment to this material by the standard-setting organization will not affect the DOE test procedures unless and until DOE amends its test procedures. The Department incorporates the material as it exists on the date of the approval by the Federal Register and a notice of any change in the material will be published in the FEDERAL REGISTER.

(b) *Test procedure incorporated by reference.* Environmental Protection Agency "ENERGY STAR Program Requirements for Exit Signs," Version 2.0 issued January 1, 1999.

(c) *Availability of reference*—(1) *Inspection of test procedure.* The test procedure incorporated by reference are available for inspection at:

(i) National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call (202) 741–6030, or go to: *http://www.archives.gov/federal__register/code__of__federal__regulations/ibr__locations.html.*

(ii) U.S. Department of Energy, Forrestal Building, Room 1J–018 (Resource Room of the Building Technologies Program), 1000 Independence Avenue, SW., Washington, DC 20585–0121, (202) 586–9127, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays.

(2) *Obtaining copies of the standard.* Copies of the Environmental Protection Agency "ENERGY STAR Program Requirements for Exit Signs," Version 2.0, may be obtained from the Environmental Protection Agency, Ariel Rios Building, 1200 Pennsylvania Avenue, NW., Washington, DC 20460, (202) 272–0167 or at*http://www.epa.gov.*

[71 FR 71373, Dec. 8, 2006]

§ 431.204 Uniform test method for the measurement of energy consumption of illuminated exit signs.

(a) *Scope.* This section provides the test procedure for measuring, pursuant to EPCA, the input power demand of illuminated exit signs. For purposes of this part 431 and EPCA, the test procedure for measuring the input power demand of illuminated exit signs shall be the test procedure specified in § 431.203(b).

(b) *Testing and Calculations.* Determine the energy efficiency of each covered product by conducting the test

procedure, set forth in the Environmental Protection Agency's "ENERGY STAR Program Requirements for Exit Signs," Version 2.0, section 4 (Test Criteria), "Conditions for testing" and "Input power measurement." (Incorporated by reference, see § 431.203)

[71 FR 71373, Dec. 8, 2006]

§ 431.205 Units to be tested.

For each basic model of illuminated exit sign selected for testing, a sample of sufficient size shall be selected at random and tested to ensure that—

(a) Any represented value of estimated input power demand or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of:

(1) The mean of the sample, or

(2) The upper 95 percent confidence limit of the true mean divided by 1.10; 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 no greater than the lower of:

(1) The mean of the sample, or

(2) The lower 95 percent confidence limit of the true mean divided by 0.90.

(Components of similar design may be substituted without requiring additional testing if the represented measures of energy continue to satisfy the applicable sampling provision.)

[75 FR 669, Jan. 5, 2010]

ENERGY CONSERVATION STANDARDS

§ 431.206 Energy conservation standards and their effective dates.

An illuminated exit sign manufactured on or after January 1, 2006, shall have an input power demand of 5 watts or less per face.

Subpart M—Traffic Signal Modules and Pedestrian Modules

SOURCE: 70 FR 60417, Oct. 18, 2005, unless otherwise noted.

§ 431.221 Purpose and scope.

This subpart contains energy conservation requirements for traffic signal modules and pedestrian modules, pursuant to Part B of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6291–6309.

§ 431.222 Definitions concerning traffic signal modules and pedestrian modules.

Basic model means, with respect to traffic signal modules and pedestrian modules, all units of a given type of traffic signal module or pedestrian module (or class thereof) manufactured by one manufacturer and which have the same primary energy source, which have electrical characteristics that are essentially identical, and which do not have any differing electrical, physical, or functional characteristics that affect energy consumption.

Maximum wattage means the power consumed by the module after being operated for 60 minutes while mounted in a temperature testing chamber so that the lensed portion of the module is outside the chamber, all portions of the module behind the lens are within the chamber at a temperature of 74 °C and the air temperature in front of the lens is maintained at a minimum of 49 °C.

Nominal wattage means the power consumed by the module when it is operated within a chamber at a temperature of 25 °C after the signal has been operated for 60 minutes.

Pedestrian module means a light signal used to convey movement information to pedestrians.

Traffic signal module means a standard 8-inch (200 mm) or 12-inch (300 mm) traffic signal indication that—

(1) Consists of a light source, a lens, and all other parts necessary for operation; and

(2) Communicates movement messages to drivers through red, amber, and green colors.

[70 FR 60417, Oct. 18, 2005, as amended at 71 FR 71373, Dec. 8, 2006]

TEST PROCEDURES

§ 431.223 Materials incorporated by reference.

(a) *General.* The Department incorporates by reference the following test procedures into subpart M of part 431. The Director of the Federal Register

has approved the material listed in paragraph (b) of this section for incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Any subsequent amendment to this material by the standard-setting organization will not affect the DOE test procedures unless and until DOE amends its test procedures. The Department incorporates the material as it exists on the date of the approval by the Federal Register and a notice of any change in the material will be published in the FEDERAL REGISTER.

(b) *List of test procedures incorporated by reference.* (1) Environmental Protection Agency, "ENERGY STAR Program Requirements for Traffic Signals," Version 1.1 issued February 4, 2003.

(2) Institute of Transportation Engineers (ITE), "Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Circular Signal Supplement," June 27, 2005.

(c) *Availability of references*—(1) *Inspection of test procedures.* The test procedures incorporated by reference are available for inspection at:

(i) National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call (202) 741–6030, or go to: *http://www.archives.gov/federal__register/code__of__federal__regulations/ibr__locations.html.*

(ii) U.S. Department of Energy, Forrestal Building, Room 1J–018 (Resource Room of the Building Technologies Program), 1000 Independence Avenue, SW., Washington, DC 20585–0121, (202) 586–9127, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays.

(2) *Obtaining copies of standards.* Standards incorporated by reference may be obtained from the following sources:

(i) Copies of the Environmental Protection Agency "ENERGY STAR Program Requirements for Traffic Signals," Version 1.1, may be obtained from the Environmental Protection Agency, Ariel Rios Building, 1200 Pennsylvania Avenue, NW., Washington, DC 20460, (202) 272–0167 or at *http://www.epa.gov.*

(ii) Institute of Transportation Engineers, 1099 14th Street, NW., Suite 300 West, Washington, DC 20005–3438, (202) 289–0222, or *ite__staff@ite.org.*

[71 FR 71373, Dec. 8, 2006]

§ 431.224 Uniform test method for the measurement of energy consumption for traffic signal modules and pedestrian modules.

(a) *Scope.* This section provides the test procedures for measuring, pursuant to EPCA, the maximum wattage and nominal wattage of traffic signal modules and pedestrian modules. For purposes of 10 CFR part 431 and EPCA, the test procedures for measuring the maximum wattage and nominal wattage of traffic signal modules and pedestrian modules shall be the test procedures specified in § 431.223(b).

(b) *Testing and Calculations.* Determine the nominal wattage and maximum wattage of each covered traffic signal module or pedestrian module by conducting the test procedure set forth in Environmental Protection Agency, "ENERGY STAR Program Requirements for Traffic Signals," Version 1.1, section 1, "Definitions," and section 4, "Test Criteria." (Incorporated by reference, see § 431.223) Use a wattmeter having an accuracy of ±1% to measure the nominal wattage and maximum wattage of a red and green traffic signal module, and a pedestrian module when conducting the photometric and colormetric tests as specified by the testing procedures in VTCSH 2005.

[71 FR 71373, Dec. 8, 2006]

§ 431.225 Units to be tested.

For each basic model of traffic signal module or pedestrian module selected for testing, a sample of sufficient size shall be selected at random and tested to ensure that—

(a) 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 no less than the higher of:

(1) The mean of the sample, or

(2) The upper 95 percent confidence limit of the true mean divided by 1.10; 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 no greater than the lower of:

(1) The mean of the sample, or

(2) The lower 95 percent confidence limit of the true mean divided by 0.90.

(Components of similar design may be substituted without requiring additional testing if the represented measures of energy continue to satisfy the applicable sampling provision.)

[75 FR 669, Jan. 5, 2010]

ENERGY CONSERVATION STANDARDS

§ 431.226 Energy conservation standards and their effective dates.

Any traffic signal module or pedestrian module manufactured on or after January 1, 2006, shall meet both of the following requirements:

(a) Have a nominal wattage and maximum wattage no greater than:

	Maximum wattage (at 74 °C)	Nominal wattage (at 25 °C)
Traffic Signal Module Type:		
12″ Red Ball	17	11
8″ Red Ball	13	8
12″ Red Arrow	12	9
12″ Green Ball	15	15
8″ Green Ball	12	12
12″ Green Arrow	11	11
Pedestrian Module Type:		
Combination Walking Man/Hand	16	13
Walking Man	12	9
Orange Hand	16	13

(b) Be installed with compatible, electrically connected signal control interface devices and conflict monitoring systems.

[70 FR 60417, Oct. 18, 2005, as amended at 71 FR 71374, Dec. 8, 2006]

Subpart N—Unit Heaters

SOURCE: 70 FR 60418, Oct. 18, 2005, unless otherwise noted.

§ 431.241 Purpose and scope.

This subpart contains energy conservation requirements for unit heaters, pursuant to Part B of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6291–6309.

§ 431.242 Definitions concerning unit heaters.

Unit heater means a self-contained fan-type heater designed to be installed within the heated space; however, the term does not include a warm air furnace.

Automatic flue damper means a device installed in the flue outlet or in the inlet of or upstream of the draft control device of an individual, automatically operated, fossil fuel-fired appliance that is designed to automatically open the flue outlet during appliance operation and to automatically close the flue outlet when the appliance is in a standby condition.

Automatic vent damper means a device intended for installation in the venting system of an individual, automatically operated, fossil fuel-fired appliance either in the outlet or downstream of the appliance draft control device, which is designed to automatically open the venting system when the appliance is in operation and to automatically close off the venting system when the appliance is in a standby or shutdown condition.

Intermittent ignition device means an ignition device in which the ignition source is automatically shut off when the appliance is in an off or standby condition.

Power venting means a venting system that uses a separate fan, either integral to the appliance or attached to the vent pipe, to convey products of combustion and excess or dilution air through the vent pipe.

Warm air furnace means commercial warm air furnace as defined in § 431.72.

[70 FR 60418, Oct. 18, 2005, as amended at 71 FR 71374, Dec. 8, 2006]

TEST PROCEDURES [RESERVED]

ENERGY CONSERVATION STANDARDS

§ 431.246 Energy conservation standards and their effective dates.

A unit heater manufactured on or after August 8, 2008, shall:

(a) Be equipped with an intermittent ignition device; and

(b) Have power venting or an automatic flue damper. An automatic vent damper is an acceptable alternative to an automatic flue damper for those

unit heaters where combustion air is drawn from the conditioned space.

[70 FR 60418, Oct. 18, 2005, as amended at 71 FR 71374, Dec. 8, 2006]

Subpart O—Commercial Prerinse Spray Valves

SOURCE: 70 FR 60418, Oct. 18, 2005, unless otherwise noted.

§ 431.261 Purpose and scope.

This subpart contains energy conservation requirements for commercial prerinse spray valves, pursuant to section 135 of the Energy Policy Act of 2005, Pub. L. 109–58.

§ 431.262 Definitions concerning commercial prerinse spray valves.

Basic model means, with respect to commercial prerinse spray valves, all units of a given type of commercial prerinse spray valve (or class thereof) manufactured by one manufacturer and which have the identical flow control mechanism attached to or installed within the fixture fitting, or the identical water-passage design features that use the same path of water in the highest flow mode.

Commercial prerinse spray valve means a handheld device designed and marketed for use with commercial dishwashing and ware washing equipment that sprays water on dishes, flatware, and other food service items for the purpose of removing food residue before cleaning the items.

[70 FR 60418, Oct. 18, 2005, as amended at 71 FR 71374, Dec. 8, 2006]

TEST PROCEDURES

§ 431.263 Materials incorporated by reference.

(a) *General.* The Department incorporates by reference the following test procedure into subpart O of part 431. The Director of the Federal Register has approved the material listed in paragraph (b) of this section for incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Any subsequent amendment to this material by the standard-setting organization will not affect the DOE test procedures unless DOE amends its test procedures. The Department incorporates the material as it exists on the date of the approval by the Federal Register and a notice of any change in the material will be published in the FEDERAL REGISTER.

(b) *Test procedure incorporated by reference.* American Society for Testing and Materials (ASTM) Standard F2324–03, "Standard Test Method for Prerinse Spray Valves," October, 2003.

(c) *Availability of reference*—(1) *Inspection of the test procedure.* The test procedure incorporated by reference is available for inspection at:

(i) National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call (202) 741–6030, or go to: *http://www.archives.gov/federal-register/cfr/ibr-locations.html.*

(ii) U.S. Department of Energy, Forrestal Building, Room 1J–018 (Resource Room of the Building Technologies Program), 1000 Independence Avenue, SW., Washington, DC 20585–0121, (202) 586–9127, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays.

(2) *Obtaining a copy of the standard.* The standard incorporated by reference may be obtained from the following source: Copies of ASTM Standard F2324–03 can be obtained from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959, or telephone (610) 832–9585.

[71 FR 71374, Dec. 8, 2006]

§ 431.264 Uniform test method for the measurement of flow rate for commercial prerinse spray valves.

(a) *Scope.* This section provides the test procedure for measuring, pursuant to EPCA, the water consumption flow rate of commercial prerinse spray valves.

(b) *Testing and Calculations.* The test procedure to determine the water consumption flow rate for prerinse spray valves, expressed in gallons per minute (gpm) or liters per minute (L/min), shall be conducted in accordance with the test requirements specified in sections 4.1 and 4.2 (Summary of Test Method), 5.1 (Significance and Use), 6.1 through 6.9 (Apparatus) except 6.5, 9.1 through 9.5 (Preparation of Apparatus), and 10.1 through 10.2.5. (Procedure), and

calculations in accordance with sections 11.1 through 11.3.2 (Calculation and Report) of the ASTM F2324–03, "Standard Test Method for Prerinse Spray Valves." (Incorporated by reference, see § 431.263) Perform only the procedures pertinent to the measurement of flow rate. Record measurements at the resolution of the test instrumentation. Round off calculations to the same number of significant digits as the previous step. Round the final water consumption value to one decimal place as follows:

(1) A fractional number at or above the midpoint between two consecutive decimal places shall be rounded up to the higher of the two decimal places; or

(2) A fractional number below the midpoint between two consecutive decimal places shall be rounded down to the lower of the two decimal places.

[71 FR 71374, Dec. 8, 2006]

§ 431.265 Units to be tested.

For each basic model of commercial prerinse spray valves selected for testing, a sample of sufficient size shall be selected at random and tested to ensure that—

(a) Any represented value of estimated water consumption or other measure of water consumption of a basic model for which consumers would favor lower values shall be no less than the higher of:

(1) The mean of the sample, or

(2) The upper 95 percent confidence limit of the true mean divided by 1.10; and

(b) Any represented value of the water efficiency or other measure of water consumption of a basic model for which consumers would favor higher values shall be no greater than the lower of:

(1) The mean of the sample, or

(2) The lower 95 percent confidence limit of the true mean divided by 0.90.

(Components of similar design may be substituted without requiring additional testing if the represented measures of energy continue to satisfy the applicable sampling provision.)

[75 FR 669, Jan. 5, 2010]

ENERGY CONSERVATION STANDARDS

§ 431.266 Energy conservation standards and their effective dates.

Commercial prerinse spray valves manufactured on or after January 1, 2006, shall have a flow rate of not more than 1.6 gallons per minute.

Subpart P—Mercury Vapor Lamp Ballasts

SOURCE: 70 FR 60418, Oct. 18, 2005, unless otherwise noted.

§ 431.281 Purpose and scope.

This subpart contains energy conservation requirements for mercury vapor lamp ballasts, pursuant to section 135 of the Energy Policy Act of 2005, Pub. L. 109–58.

§ 431.282 Definitions concerning mercury vapor lamp ballasts.

Ballast means a device used with an electric discharge lamp to obtain necessary circuit conditions (voltage, current, and waveform) for starting and operating.

High intensity discharge lamp means an electric-discharge lamp in which—

(1) The light-producing arc is stabilized by the arc tube wall temperature; and

(2) The arc tube wall loading is in excess of 3 Watts/cm^2, including such lamps that are mercury vapor, metal halide, and high-pressure sodium lamps.

Mercury vapor lamp means a high intensity discharge lamp, including clear, phosphor-coated, and self-ballasted screw base lamps, in which the major portion of the light is produced by radiation from mercury typically operating at a partial vapor pressure in excess of 100,000 Pa (approximately 1 atm).

Mercury vapor lamp ballast means a device that is designed and marketed to start and operate mercury vapor lamps intended for general illumination by providing the necessary voltage and current.

Specialty application mercury vapor lamp ballast means a mercury vapor lamp ballast that—

(1) Is designed and marketed for operation of mercury vapor lamps used in

quality inspection, industrial processing, or scientific use, including fluorescent microscopy and ultraviolet curing; and

(2) In the case of a specialty application mercury vapor lamp ballast, the label of which—

(i) Provides that the specialty application mercury vapor lamp ballast is 'For specialty applications only, not for general illumination'; and

(ii) Specifies the specific applications for which the ballast is designed.

[74 FR 12074, Mar. 23, 2009]

TEST PROCEDURES [RESERVED]

ENERGY CONSERVATION STANDARDS

§ 431.286 Energy conservation standards and their effective dates.

Mercury vapor lamp ballasts, other than specialty application mercury vapor lamp ballasts, shall not be manufactured or imported after January 1, 2008.

[74 FR 12074, Mar. 23, 2009]

Subpart Q—Refrigerated Bottled or Canned Beverage Vending Machines

SOURCE: 71 FR 71375, Dec. 8, 2006, unless otherwise noted.

§ 431.291 Scope.

This subpart specifies test procedures for certain commercial refrigerated bottled or canned beverage vending machines, pursuant to part C of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6311–6316.

§ 431.292 Definitions concerning refrigerated bottled or canned beverage vending machines.

Basic model means, with respect to refrigerated bottled or canned beverage vending machines, all units of a given type of refrigerated bottled or canned beverage vending machine (or class thereof) manufactured by one manufacturer and which have the same primary energy source, which have electrical characteristics that are essentially identical, and which do not have any differing electrical, physical, or functional characteristics that affect energy consumption.

Bottled or canned beverage means a beverage in a sealed container.

Class A means a refrigerated bottled or canned beverage vending machine that is fully cooled, and is not a combination vending machine.

Class B means any refrigerated bottled or canned beverage vending machine not considered to be Class A, and is not a combination vending machine.

Combination vending machine means a refrigerated bottled or canned beverage vending machine that also has non-refrigerated volumes for the purpose of vending other, non-"sealed beverage" merchandise.

Refrigerated bottled or *canned beverage vending machine* means a commercial refrigerator that cools bottled or canned beverages and dispenses the bottled or canned beverages on payment.

V means the refrigerated volume (ft^3) of the refrigerated bottled or canned beverage vending machine, as measured by ANSI/AHAM HRF–1–2004 (incorporated by reference, see § 431.293).

[71 FR 71375, Dec. 8, 2006, as amended at 74 FR 44967, Aug. 31, 2009]

TEST PROCEDURES

§ 431.293 Materials incorporated by reference.

(a) *General.* DOE incorporates by reference the following standards into Subpart Q of Part 431. The material listed has been approved for incorporation by reference by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Any subsequent amendment to a standard by the standard-setting organization will not affect the DOE regulations unless and until amended by DOE. Material is incorporated as it exists on the date of the approval and a notice of any change in the material will be published in the FEDERAL REGISTER. All approved material is available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call (202) 741–6030 or visit *http://www.archives.gov/federal__register/code__of__federal__regulations/*

ibr__locations.html. This material is also available for inspection at U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, 6th Floor, 950 L'Enfant Plaza, SW., Washington, DC 20024, 202–586–2945, or visit *http://www1.eere.energy.gov/buildings/appliance__standards*. Standards can be obtained from the sources listed below.

(b) *ANSI*. American National Standards Institute, 25 W. 43rd Street, 4th Floor, New York, NY 10036, 212–642–4900, or visit *http://www.ansi.org*.

(1) ANSI/AHAM HRF–1–2004, Energy, Performance and Capacity of Household Refrigerators, Refrigerator-Freezers and Freezers, approved July 7, 2004, IBR approved for §§ 431.292 and 431.294.

(2) ANSI/ASHRAE Standard 32.1–2004, Methods of Testing for Rating Vending Machines for Bottled, Canned, and Other Sealed Beverages, approved December 2, 2004, IBR approved for § 431.294.

[74 FR 44967, Aug. 31, 2009]

§ 431.294 Uniform test method for the measurement of energy consumption of refrigerated bottled or canned beverage vending machines.

(a) *Scope*. This section provides test procedures for measuring, pursuant to EPCA, the energy consumption of refrigerated bottled or canned beverage vending machines.

(b) *Testing and Calculations*. (1) The test procedure for energy consumption of refrigerated bottled or canned beverage vending machines shall be conducted in accordance with the test procedures specified in section 4, "Instruments," section 5, "Vending Machine Capacity," section 6, "Test Conditions," and sections 7.1 through 7.2.3.2, under "Test Procedures," of ANSI/ASHRAE Standard 32.1–2004, "Methods of Testing for Rating Vending Machines for Bottled, Canned, and Other Sealed Beverages." (Incorporated by reference, see § 431.293) In Section 6.2, "Voltage and Frequency," test equipment with dual nameplate voltages at the lower of the two voltages only.

(2) Determine "vendible capacity" of refrigerated bottled or canned beverage vending machines in accordance with the second paragraph of section 5, "Vending Machine Capacity," of ANSI/ASHRAE Standard 32.1–2004, "Methods of Testing for Rating Vending Machines for Bottled, Canned, and Other Sealed Beverages," (Incorporated by reference, see § 431.293) and measure "refrigerated volume" of refrigerated bottled or canned beverage vending machines in accordance with the methodology specified in section 5.2, "Total Refrigerated Volume," (excluding subsections 5.2.2.2 through 5.2.2.4) of the ANSI/AHAM HRF–1–2004, "Energy, Performance and Capacity of Household Refrigerators, Refrigerator-Freezers and Freezers," (Incorporated by reference, see §§ 431.63 and 431.293).

§ 431.295 Units to be tested.

For each basic model of refrigerated bottled or canned beverage vending machine selected for testing, a sample of sufficient size shall be selected at random and tested to ensure that—

(a) Any represented value of estimated energy consumption or other measure of energy consumption of a basic model for which consumers would favor lower values shall be no less than the higher of:

(1) The mean of the sample, or

(2) The upper 95 percent confidence limit of the true mean divided by 1.10; 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 no greater than the lower of:

(1) The mean of the sample, or

(2) The lower 95 percent confidence limit of the true mean divided by 0.90.

(Components of similar design may be substituted without requiring additional testing if the represented measures of energy continue to satisfy the applicable sampling provision.)

[75 FR 669, Jan. 5, 2010]

ENERGY CONSERVATION STANDARDS

§ 431.296 Energy conservation standards and their effective dates.

Each refrigerated bottled or canned beverage vending machine manufactured on or after August 31, 2012 shall have a maximum daily energy consumption (in kilowatt hours per day), when measured at the 75 °F ± 2 °F and

45 ± 5% RH condition, that does not exceed the following:

Equipment class	Maximum daily energy consumption (kilowatt hours per day)
Class A	MDEC = 0.055 × V + 2.56.
Class B	MDEC = 0.073 × V + 3.16.
Combination Vending Machines	[Reserved].

[74 FR 44967, Aug. 31, 2009]

EFFECTIVE DATE NOTE: At 74 FR 44967, Aug. 31, 2009, an undesignated center heading and § 431.296 were added, effective Aug. 31, 2012. At 74 FR 45979, Sept. 8, 2009, § 431.296 was corrected by, in the third and fourth lines, changing "[Insert date 3 years from the date of publication of this final rule]" to read "August 31, 2012".

Subpart R—Walk-in Coolers and Walk-in Freezers

SOURCE: 74 FR 12074, Mar. 23, 2009, unless otherwise noted.

§ 431.301 Purpose and scope.

This subpart contains energy conservation requirements for walk-in coolers and walk-in freezers, pursuant to Part C of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6311–6317.

§ 431.302 Definitions concerning walk-in coolers and walk-in freezers.

Walk-in cooler and walk-in freezer mean an enclosed storage space refrigerated to temperatures, respectively, above, and at or below 32 degrees Fahrenheit that can be walked into, and has a total chilled storage area of less than 3,000 square feet; however the terms do not include products designed and marketed exclusively for medical, scientific, or research purposes.

TEST PROCEDURES

§ 431.303 Materials incorporated by reference.

(a) *General.* We incorporate by reference the following standards into Subpart R of part 431. The material listed has been approved for incorporation by reference by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Any subsequent amendment to a standard by the standard-setting organization will not affect the DOE regulations unless and until amended by DOE. Material is incorporated as it exists on the date of the approval and a notice of any change in the material will be published in the FEDERAL REGISTER. All approved material is available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030 or go to *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html*. Also, this material is available for inspection at U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, 6th Floor, 950 L'Enfant Plaza, SW., Washington, DC 20024, 202–586–2945, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays, or go to: *http://www1.eere.energy.gov/buildings/appliance_standards/*. Standards can be obtained from the sources listed below.

(b) *ASTM.* American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428–2959, (610) 832–9500, or *http://www.astm.org*.

(1) ASTM C518–04 ("ASTM C518"), Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus, approved May 1, 2004, IBR approved for § 431.304.

(2) [Reserved]

§ 431.304 Uniform test method for the measurement of energy consumption of walk-in coolers and walk-in freezers.

(a) *Scope.* This section provides test procedures for measuring, pursuant to EPCA, the energy consumption of refrigerated bottled or canned beverage vending machines.

(b) *Testing and Calculations.* (1) [Reserved]

(2) The R value shall be the 1/K factor multiplied by the thickness of the panel.

(3) The K factor shall be based on ASTM C518 (incorporated by reference; see § 431.303).

(4) For calculating the R value for freezers, the K factor of the foam at 20

degrees Fahrenheit (average foam temperature) shall be used.

(5) For calculating the R value for coolers, the K factor of the foam at 55 degrees Fahrenheit (average foam temperature) shall be used.

§ 431.305 [Reserved]

ENERGY CONSERVATION STANDARDS

§ 431.306 Energy conservation standards and their effective dates.

(a) Each walk-in cooler or walk-in freezer manufactured on or after January 1, 2009, shall—

(1) Have automatic door closers that firmly close all walk-in doors that have been closed to within 1 inch of full closure, except that this paragraph shall not apply to doors wider than 3 feet 9 inches or taller than 7 feet;

(2) Have strip doors, spring hinged doors, or other method of minimizing infiltration when doors are open;

(3) Contain wall, ceiling, and door insulation of at least R–25 for coolers and R–32 for freezers, except that this paragraph shall not apply to glazed portions of doors nor to structural members;

(4) Contain floor insulation of at least R–28 for freezers;

(5) For evaporator fan motors of under 1 horsepower and less than 460 volts, use—

(i) Electronically commutated motors (brushless direct current motors); or

(ii) 3-phase motors;

(6) For condenser fan motors of under 1 horsepower, use—

(i) Electronically commutated motors (brushless direct current motors);

(ii) Permanent split capacitor-type motors; or

(iii) 3-phase motors; and

(7) For all interior lights, use light sources with an efficacy of 40 lumens per watt or more, including ballast losses (if any), except that light sources with an efficacy of 40 lumens per watt or less, including ballast losses (if any), may be used in conjunction with a timer or device that turns off the lights within 15 minutes of when the walk-in cooler or walk-in freezer is not occupied by people.

(b) Each walk-in cooler or walk-in freezer with transparent reach-in doors manufactured on or after January 1, 2009, shall also meet the following specifications:

(1) Transparent reach-in doors for walk-in freezers and windows in walk-in freezer doors shall be of triple-pane glass with either heat-reflective treated glass or gas fill.

(2) Transparent reach-in doors for walk-in coolers and windows in walk-in cooler doors shall be—

(i) Double-pane glass with heat-reflective treated glass and gas fill; or

(ii) Triple-pane glass with either heat-reflective treated glass or gas fill.

(3) If the walk-in cooler or walk-in freezer has an antisweat heater without antisweat heat controls, the walk-in cooler and walk-in freezer shall have a total door rail, glass, and frame heater power draw of not more than 7.1 watts per square foot of door opening (for freezers) and 3.0 watts per square foot of door opening (for coolers).

(4) If the walk-in cooler or walk-in freezer has an antisweat heater with antisweat heat controls, and the total door rail, glass, and frame heater power draw is more than 7.1 watts per square foot of door opening (for freezers) and 3.0 watts per square foot of door opening (for coolers), the antisweat heat controls shall reduce the energy use of the antisweat heater in a quantity corresponding to the relative humidity in the air outside the door or to the condensation on the inner glass pane.

Subpart S—Metal Halide Lamp Ballasts and Fixtures

SOURCE: 74 FR 12075, Mar. 23, 2009, unless otherwise noted.

§ 431.321 Purpose and scope.

This subpart contains energy conservation requirements for metal halide lamp ballasts and fixtures, pursuant to Part A of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6291–6309.

[75 FR 10966, Mar. 9, 2010]

§ 431.322 Definitions concerning metal halide lamp ballasts and fixtures.

AC control signal means an alternating current (AC) signal that is supplied to the ballast using additional wiring for the purpose of controlling the ballast and putting the ballast in standby mode.

Active mode means the condition in which an energy-using product:

(1) Is connected to a main power source;

(2) Has been activated; and

(3) Provides one or more main functions.

Ballast means a device used with an electric discharge lamp to obtain necessary circuit conditions (voltage, current, and waveform) for starting and operating.

Ballast efficiency means, in the case of a high intensity discharge fixture, the efficiency of a lamp and ballast combination, expressed as a percentage, and calculated in accordance with the following formula: Efficiency = P_{out}/P_{in} where:

(1) P_{out} equals the measured operating lamp wattage;

(2) P_{in} equals the measured operating input wattage;

(3) The lamp, and the capacitor when the capacitor is provided, shall constitute a nominal system in accordance with the ANSI C78.43, (incorporated by reference; see § 431.323);

(4) For ballasts with a frequency of 60 Hz, P_{in} and P_{out} shall be measured after lamps have been stabilized according to section 4.4 of ANSI C82.6 (incorporated by reference; see § 431.323) using a wattmeter with accuracy specified in section 4.5 of ANSI C82.6; and

(5) For ballasts with a frequency greater than 60 Hz, P_{in} and P_{out} shall have a basic accuracy of ±0.5 percent at the higher of either 3 times the output operating frequency of the ballast or 2.4 kHz.

Basic model means, with respect to metal halide lamp ballasts, all units of a given type of metal halide lamp ballast (or class thereof) that:

(1) Are rated to operate a given lamp type and wattage;

(2) Have essentially identical electrical characteristics; and

(3) Have no differing electrical, physical, or functional characteristics that affect energy consumption.

DC control signal means a direct current (DC) signal that is supplied to the ballast using additional wiring for the purpose of controlling the ballast and putting the ballast in standby mode.

Electronic ballast means a device that uses semiconductors as the primary means to control lamp starting and operation.

Metal halide ballast means a ballast used to start and operate metal halide lamps.

Metal halide lamp means a high intensity discharge lamp in which the major portion of the light is produced by radiation of metal halides and their products of dissociation, possibly in combination with metallic vapors.

Metal halide lamp fixture means a light fixture for general lighting application designed to be operated with a metal halide lamp and a ballast for a metal halide lamp.

Off mode means the condition in which an energy-using product:

(1) Is connected to a main power source; and

(2) Is not providing any standby or active mode function.

PLC control signal means a power line carrier (PLC) signal that is supplied to the ballast using the input ballast wiring for the purpose of controlling the ballast and putting the ballast in standby mode.

Probe-start metal halide ballast means a ballast that starts a probe-start metal halide lamp that contains a third starting electrode (probe) in the arc tube, and does not generally contain an igniter but instead starts lamps with high ballast open circuit voltage.

Pulse-start metal halide ballast means an electronic or electromagnetic ballast that starts a pulse-start metal halide lamp with high voltage pulses, where lamps shall be started by the ballast first providing a high voltage pulse for ionization of the gas to produce a glow discharge and then power to sustain the discharge through the glow-to-arc transition.

Standby mode means the condition in which an energy-using product:

(1) Is connected to a main power source; and

(2) Offers one or more of the following user-oriented or protective functions:

(i) To facilitate the activation or deactivation of other functions (including active mode) by remote switch (including remote control), internal sensor, or timer;

(ii) Continuous functions, including information or status displays (including clocks) or sensor-based functions.

Wireless control signal means a wireless signal that is radiated to and received by the ballast for the purpose of controlling the ballast and putting the ballast in standby mode.

[74 FR 12075, Mar. 23, 2009, as amended at 75 FR 10966, Mar. 9, 2010]

TEST PROCEDURES

§ 431.323 Materials incorporated by reference.

(a) *General.* We incorporate by reference the following standards into Subpart S of Part 431. The material listed has been approved for incorporation by reference by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Any subsequent amendment to a standard by the standard-setting organization will not affect the DOE regulations unless and until amended by DOE. Material is incorporated as it exists on the date of the approval and a notice of any change in the material will be published in the FEDERAL REGISTER. All approved material is available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030 or go to *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.* Also, this material is available for inspection at U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, 6th Floor, 950 L'Enfant Plaza, SW., Washington, DC 20024, 202–586–2945, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays, or go to: *http://www1.eere.energy.gov/buildings/appliance_standards/.* Standards can be obtained from the sources listed below.

(b) *ANSI.* American National Standards Institute, 25 W. 43rd Street, 4th Floor, New York, NY 10036, 212–642–4900, or go to *http://www.ansi.org.*

(1) ANSI C78.43–2004, Revision and consolidation of ANSI C78.1372–1997, .1374–1997, .1375–1997, .1376–1997, .1377–1997, .1378–1997, .1379–1997, .1382–1997, .1384–1997, and .1650–2003 ("ANSI C78.43"), American National Standard for electric lamps: Single-Ended Metal Halide Lamps, approved May 5, 2004, IBR approved for § 431.322;

(2) ANSI C82.6–2005, Proposed Revision of ANSI C82.6–1985 ("ANSI C82.6"), American National Standard for Lamp Ballasts—Ballasts for High-Intensity Discharge Lamps—Methods of Measurement, approved February 14, 2005, IBR approved for § 431.322; and § 431.324.

(c) *NFPA.* National Fire Protection Association, 11 Tracy Drive, Avon, MA 02322, 1–800–344–3555, or go to *http://www.nfpa.org;*

(1) NFPA 70–2002 ("NFPA 70"), National Electrical Code 2002 Edition, IBR approved for § 431.326;

(2) [Reserved]

(e) UL. Underwriters Laboratories, Inc., COMM 2000, 1414 Brook Drive, Downers Grove, IL 60515, 1–888–853–3503, or go to *http://www.ul.com.*

(1) UL 1029 (ANSI/UL 1029–2007) ("UL 1029"), Standard for Safety High-Intensity-Discharge Lamp Ballasts, 5th edition, May 25, 1994, which consists of pages dated May 25, 1994, September 28, 1995, August 3, 1998, February 7, 2001 and December 11, 2007, IBR approved for § 431.326.

(2) [Reserved]

[74 FR 12075, Mar. 23, 2009, as amended at 75 FR 10966, Mar. 9, 2010]

§ 431.324 Uniform test method for the measurement of energy efficiency and standby mode energy consumption of metal halide lamp ballasts.

(a) *Scope.* This section provides test procedures for measuring, pursuant to EPCA, the energy efficiency of metal halide ballasts.

(b) *Testing and Calculations Active Mode.* (1)(i) *Test Conditions.* The power supply, ballast test conditions, lamp position, lamp stabilization, and test instrumentation shall all conform to the requirements specified in section 4.0, "General Conditions for Electrical

Performance Tests," of ANSI C82.6 (incorporated by reference; see § 431.323). Ambient temperatures for the testing period shall be maintained at 25 °C ± 5 °C. Airflow in the room for the testing period shall be ≤0.5 meters/second. The ballast shall be operated until equilibrium. Lamps used in the test shall conform to the general requirements in section 4.4.1 of ANSI C82.6 and be seasoned for a minimum of 100 hour prior to use in ballast tests. Basic lamp stabilization shall conform to the general requirements in section 4.4.2 of ANSI C82.6, and stabilization shall be reached when the lamp's electrical characteristics vary by no more than 3-percent in three consecutive 10- to 15-minute intervals measured after the minimum burning time of 30 minutes. After the stabilization process has begun, the lamp shall not be moved or repositioned until after the testing is complete. In order to avoid heating up the test ballast during lamp stabilization, which could cause resistance changes and result in unrepeatable data, it is necessary to warm up the lamp on a standby ballast. This standby ballast should be a commercial ballast of a type similar to the test ballast in order to be able to switch a stabilized lamp to the test ballast without extinguishing the lamp. Fast-acting or make-before-break switches are recommended to prevent the lamps from extinguishing during switchover.

(ii) Alternative Stabilization Method. In cases where switching without extinguishing the lamp is impossible or for low-frequency electronic ballasts, the following alternative stabilization method shall be used. The lamp characteristics are determined using a reference ballast and recorded for future comparison. The same lamp is to be driven by the ballast under test until the ballast reaches operational stability. Operational stability is defined by three consecutive measurements, 5 minutes apart, of the lamp power where the three readings are within 2.5 percent. The electrical measurements are to be taken within 5 minutes after conclusion of the stabilization period.

(2) *Test Measurement.* The ballast input power and lamp output power during operating conditions shall be measured in accordance with the methods specified in section 6.0, "Ballast Measurements (Multiple-Supply Type Ballasts)" of the ANSI C82.6 (incorporated by reference; *see* § 431.323).

(3) *Efficiency Calculation.* The measured lamp output power shall be divided by the ballast input power to determine the percent efficiency of the ballast under test.

(c) *Testing and Calculations-Standby Mode.* The measurement of standby mode need not be performed to determine compliance with energy conservation standards for metal halide lamp fixtures at this time. The above statement will be removed as part of the rulemaking to amend the energy conservation standards for metal halide lamp fixtures to account for standby mode energy consumption, and the following shall apply on the compliance date for such requirements. However, all representations related to standby mode energy consumption of these products made after September 7, 2010, must be based upon results generated under this test procedure.

(1) *Test Conditions.* The power supply, ballast test conditions, and test instrumentation shall all conform to the requirements specified in section 4.0, "General Conditions for Electrical Performance Tests," of the ANSI C82.6 (incorporated by reference; see § 431.323) Ambient temperatures for the testing period shall be maintained at 25 °C ± 5 °C. Send a signal to the ballast instructing it to have zero light output using the appropriate ballast communication protocol or system for the ballast being tested.

(2) *Measurement of Main Input Power.* Measure the input power (watts) to the ballast in accordance with the methods specified in section 6.0, "Ballast Measurements (Multiple-Supply Type Ballasts)" of the ANSI C82.6 (incorporated by reference; see § 431.323).

(3) *Measurement of Control Signal Power.* The power from the control signal path is measured using all applicable methods described below:

(i) *DC Control Signal.* Measure the DC control signal voltage, using a voltmeter (V), and current, using an ammeter (A) connected to the ballast in accordance with the circuit shown in Figure 1. The DC control signal power is calculated by multiplying the DC

control signal voltage by the DC control signal current.

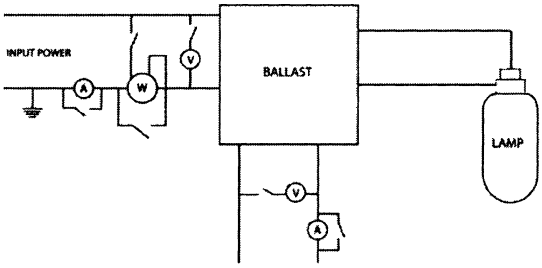

Figure 1. Circuit for Measuring DC Control Signal Power in Standby Mode

(ii) *AC Control Signal.* Measure the AC control signal power (watts), using a wattmeter capable of indicating true RMS power in watts (W), connected to the ballast in accordance with the circuit shown in Figure 2.

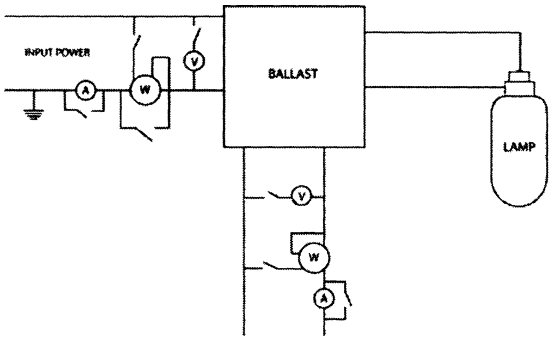

Figure 2. Circuit for Measuring AC Control Signal Power in Standby Mode

(iii) *Power Line Carrier (PLC) Control Signal.* Measure the PLC control signal power (watts), using a wattmeter capable of indicating true RMS power in watts (W) connected to the ballast in accordance with the circuit shown in Figure 3. The wattmeter must have a frequency response that is at least 10 times higher than the PLC being measured to measure the PLC signal correctly. The wattmeter must also be high-pass filtered to filter out power at 60 Hz.

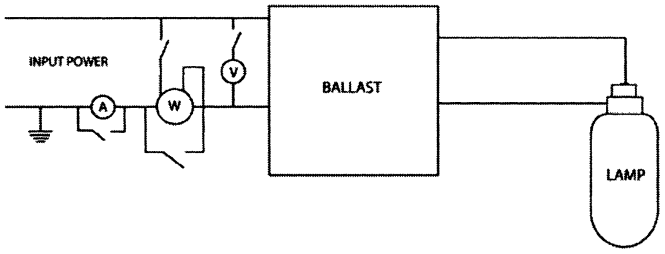

Figure 3. Circuit for Measuring PLC Control Signal Power in Standby Mode

[74 FR 12075, Mar. 23, 2009, as amended at 75 FR 10966, Mar. 9, 2010]

§ 431.325 Units to be tested.

For each basic model of metal halide lamp ballast selected for testing, a sample of sufficient size, no less than four, shall be selected at random and tested to ensure that:

(a) 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 no less than the higher of:

(1) The mean of the sample, or

(2) The upper 99-percent confidence limit of the true mean divided by 1.01.

(b) Any represented value of the energy efficiency of a basic model is no greater than the lower of:

(1) The mean of the sample, or

(2) The lower 99-percent confidence limit of the true mean divided by 0.99.

[75 FR 10968, Mar. 9, 2010]

ENERGY CONSERVATION STANDARDS

§ 431.326 Energy conservation standards and their effective dates.

(a) Except as provided in paragraph (b) of this section, each metal halide lamp fixture manufactured on or after January 1, 2009, and designed to be operated with lamps rated greater than or equal to 150 watts but less than or equal to 500 watts shall contain—

(1) A pulse-start metal halide ballast with a minimum ballast efficiency of 88 percent;

(2) A magnetic probe-start ballast with a minimum ballast efficiency of 94 percent; or

(3) A nonpulse-start electronic ballast with either a minimum ballast efficiency of 92 percent for wattages greater than 250 watts; or a minimum ballast efficiency of 90 percent for wattages less than or equal to 250 watts.

(b) The standards described in paragraph (a) of this section do not apply to—

(1) Metal halide lamp fixtures with regulated lag ballasts;

(2) Metal halide lamp fixtures that use electronic ballasts that operate at 480 volts; or

(3) Metal halide lamp fixtures that;

(i) Are rated only for 150 watt lamps;

(ii) Are rated for use in wet locations; as specified by the National Fire Protection Association in NFPA 70 (incorporated by reference; *see* § 431.323); and

(iii) Contain a ballast that is rated to operate at ambient air temperatures above 50 °C, as specified in UL 1029, (incorporated by reference; *see* § 431.323).

§ 431.327 Submission of data.

(a) *Certification.* (1) Except as provided in paragraph (a)(2) of this section, each manufacturer or private labeler, before distributing in commerce any basic model of equipment covered by this subpart and subject to an energy conservation standard set forth in this part, shall certify by means of a compliance statement and a certification report that each basic model meets the applicable energy conservation standard.

(2) Each manufacturer or private labeler of a basic model of metal halide lamp ballast shall file a compliance

statement and its first certification report with DOE on or before March 9, 2011.

(3) *Amendment of information.* If information in a compliance statement or certification report previously submitted to the Department under this section is found to be incorrect, each manufacturer or private labeler (or an authorized representative) must submit the corrected information to the Department at the address and in the manner described in this section.

(4) *Third-party representatives.* Each manufacturer or private labeler shall notify the Department when designating a third-party representative and shall notify the Department of any changes of third-party representatives which is to be sent to the Department at the address and in the manner described in this section.

(5) *Compliance statement.* Each manufacturer or private labeler need submit its compliance statement once. Such statement shall include all required information specified in the format set forth in Appendix A of this subpart and shall certify, with respect to each basic model currently produced by the manufacturer and all new basic models it introduces in the future, that:

(i) Each basic model complies and will comply with the applicable energy conservation standard;

(ii) All representations as to efficiency in the manufacturer's certification report(s) are and will be based on testing conducted in accordance with the applicable test requirements prescribed in this subpart;

(iii) All information reported in the certification report(s) is and will be true, accurate, and complete; and

(iv) The manufacturer or private labeler 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.

(6) *Certification report.* Each manufacturer must submit to DOE a certification report for each of its metal halide lamp ballast basic models. The certification report (for which a suggested format is set forth in Appendix B of this subpart) shall include for each basic model the product type, product class, manufacturer's name, private labeler's name(s) (if applicable), the manufacturer's model number(s), and the ballast efficiency in percent. A single certification report may be used to report required information for multiple basic models.

(7) Copies of reports to the Federal Trade Commission that include the information specified in paragraph (a)(6) of this section could serve in lieu of the certification report.

(b) *Model modifications.* Any change to a basic model that affects energy consumption constitutes the addition of a new basic model. If such a change reduces energy consumption, the new model shall be considered in compliance with the standard without any additional testing. If, however, such a change increases energy consumption while meeting the standard, then the manufacturer must submit all information required by paragraph (a)(6) of this section for the new basic model.

(c) *Discontinued models.* A manufacturer shall report to the Department a basic model whose production has ceased and is no longer being distributed. For each basic model, the report shall include: equipment type, equipment class, the manufacturer's name, the private labeler's name(s) (if applicable), and the manufacturer's model number. If the reporting of discontinued models coincides with the submittal of a certification report, such information can be included in the certification report.

(d) *Third-party representation.* A manufacturer or private labeler may elect to use a third party (such as a trade association or other authorized representative) to submit the certification report to DOE. Such certification reports shall include all the information specified in paragraph (a)(6) of this section. Third parties submitting certification reports shall include the names of the manufacturers or private labelers who authorized the submittal of the certification reports to DOE on their behalf. The third-party representative also may submit model modification information, as specified in paragraph (b) of this section, and discontinued model information, as specified in paragraph (c) of this section, on behalf

of an authorizing manufacturer or private labeler.

(e) *Submission instructions.* All reports and notices required by this section shall be sent by certified mail to: U.S. Department of Energy, Building Technologies Program, Mailstop EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121, or by e-mail to the Department at: *certification.report@ee.doe.gov.* If submitting by e-mail, the compliance statement must be provided in PDF format (which shows the original signature).

[75 FR 10968, Mar. 9, 2010]

§ 431.328 Sampling.

For purposes of a certification of compliance, the determination that a basic model complies with the applicable energy conservation standard shall be based upon the testing and sampling procedures, and other applicable rating procedures, set forth in this part. For purposes of a certification of compliance, the determination that a basic model complies with the applicable design standard shall be based on the incorporation of specific design requirements specified in this part.

[75 FR 10968, Mar. 9, 2010]

§ 431.329 Enforcement.

Process for Metal Halide Lamp Ballasts. This section sets forth procedures DOE will follow in pursuing alleged noncompliance with an applicable energy conservation standard.

(a) *Performance standards.* (1) *Test notice.* Upon receiving information in writing concerning the energy performance of a particular covered equipment sold by a particular manufacturer or private labeler which indicates that the covered equipment may not be in compliance with the applicable energy standard, the Secretary may conduct a review of the test records. The Secretary may then conduct enforcement testing of that equipment under the DOE test procedure, a process that is initiated by means of a test notice addressed to the manufacturer or private labeler in accordance with the requirements outlined below.

(i) The test notice procedure will only be followed after the Secretary or his/her designated representative has examined the underlying test data provided by the manufacturer, and after the manufacturer has been offered the opportunity to meet with the Department to verify compliance with the applicable energy conservation standard and/or water conservation standard. A representative designated by the Secretary must be permitted to observe any re-verification procedures undertaken according to this subpart, and to inspect the results of such re-verification.

(ii) The test notice will be signed by the Secretary or his/her designee and will be mailed or delivered by the Department to the plant manager or other responsible official designated by the manufacturer.

(iii) The test notice will specify the basic model to be selected for testing, the number of units to be tested, the method for selecting these units, the date and time at which testing is to begin, the date when testing is scheduled to be 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 it may include alternative basic models.

(iv) The Secretary may require in the test notice that the manufacturer of covered equipment shall ship at its expense a reasonable number of units of each basic model specified in the test notice to a testing laboratory designated by the Secretary. The number of units of a basic model specified in a test notice shall not exceed 20.

(v) Within five working days of the time the units are selected, the manufacturer must ship the specified test units of a basic model to the designated testing laboratory.

(2) *Testing Laboratory.* Whenever the Department conducts enforcement testing at a designated laboratory in accordance with a test notice under this section, the resulting test data shall constitute official test data for that basic model. The Department will use such test data to make a determination of compliance or noncompliance.

(3) *Sampling.* The Secretary will base the determination of whether a manufacturer's basic model complies with the applicable energy conservation

standard on testing conducted in accordance with the applicable test procedures specified in this part, and with the following statistical sampling procedures for metal halide lamp ballasts, with the methods described in 10 CFR Part 431, Subpart S, Appendix C (Sampling Plan for Enforcement Testing).

(4) *Test unit selection.* For metal halide lamp ballasts, the following applies:

(i) The Department shall select a batch, a batch sample, and test units from the batch sample in accordance with the following provisions of this paragraph and the conditions specified in the test notice.

(ii) The batch may be subdivided by the Department using criteria specified in the test notice.

(iii) The Department will then randomly select a batch sample of up to 20 units from one or more subdivided groups within the batch. The manufacturer shall keep on hand all units in the batch sample until the basic model is determined to be in compliance or non-compliance.

(iv) The Department will randomly select individual test units comprising the test sample from the batch sample.

(v) All random selections shall be achieved by sequentially numbering all the units in a batch sample and then using a table of random numbers to select the units to be tested.

(5) *Test unit preparation.* (i) Before and during the testing, a test unit selected in accordance with paragraph (a)(4) of this section shall not be prepared, modified, or adjusted in any manner unless such preparation, modification, or adjustment is allowed by the applicable DOE test procedure. DOE will test each unit in accordance with the applicable test procedures.

(ii) No one may perform any quality control, testing, or assembly procedures 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.

(iii) A test unit shall be considered defective if it is inoperative. A test unit is also defective if it is found to be in noncompliance due to a manufacturing defect or due to failure of the unit to operate according to the manufacturer's design and operating instructions, and the manufacturer demonstrates by statistically valid means that, with respect to such defect or failure, the unit is not representative of the population of production units from which it is obtained. Defective units, including those damaged due to shipping or handling, must be reported immediately to DOE. The Department may authorize testing of an additional unit on a case-by-case basis.

(6) *Testing at manufacturer's option.* (i) If the Department determines a basic model to be in noncompliance with the applicable energy performance standard at the conclusion of its initial enforcement sampling plan testing, the manufacturer may request that the Department conduct additional testing of the basic model. Additional testing under this paragraph must be in accordance with the applicable test procedure, and for metal halide lamp ballasts, the applicable provisions in Appendix C to Subpart S to Part 431.

(ii) All units tested under this paragraph shall be selected and tested in accordance with paragraphs (a)(1)(v) and (a)(2) through (5) of this section.

(iii) The manufacturer shall bear the cost of all testing conducted under this paragraph.

(iv) The Department will advise the manufacturer of the method for selecting the additional units for testing under the sampling plan, the date and time at which testing is scheduled to begin, the date by which testing is scheduled to be completed, and the facility at which the testing will occur.

(v) The manufacturer shall cease distribution of the basic model tested under the provisions of this paragraph from the time the manufacturer elects to exercise the option provided in this paragraph until the basic model is determined to be in compliance. The Department may seek civil penalties for all units distributed during such period.

(vi) If the additional testing results in a determination of compliance, the Department will issue a notice of allowance to resume distribution.

(b) *Cessation of distribution of a basic model of commercial equipment other than electric motors.* (1) In the event the Department determines, in accordance

with enforcement provisions set forth in this subpart, that a model of covered equipment is noncompliant, or if a manufacturer or private labeler determines one of its models to be in noncompliance, the manufacturer or private labeler shall:

(i) Immediately cease distribution in commerce of all units of the basic model in question;

(ii) 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

(iii) If requested by the Secretary, provide DOE, within 30 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.

(2) The manufacturer may modify the noncompliant basic model in such manner as to make it comply with the applicable performance standard. The manufacturer or private labeler must treat such a modified basic model as a new basic model and certify it in accordance with the provisions of this subpart. In addition to satisfying all requirements of this subpart, the manufacturer must also maintain records that demonstrate that modifications have been made to all units of the new basic model before its distribution in commerce.

(3) If a manufacturer or private labeler has a basic model that is not properly certified in accordance with the requirements of this subpart, the Secretary may seek, among other remedies, injunctive action to prohibit distribution in commerce of the basic model.

[75 FR 10968, Mar. 9, 2010]

APPENDIX A TO SUBPART S OF PART 431—COMPLIANCE STATEMENT FOR METAL HALIDE LAMP BALLASTS

Equipment: Metal Halide Lamp Ballasts

Manufacturer's or Private Labeler's Name and Address:

_____

_____

[Company name] ("the company") submits this Compliance Statement under 10 CFR Part 431 (Energy Efficiency Program for Certain Commercial and Industrial Equipment) and Part A of the Energy Policy and Conservation Act (Pub. L. 94–163), and amendments thereto. I am signing this on behalf of and as a responsible official of the company. All basic models of metal halide lamp ballasts subject to energy conservation standards specified in 10 CFR Part 431 that this company manufactures comply with the applicable energy conservation standard(s). We have complied with the applicable testing requirements (prescribed in 10 CFR Part 431) in making this determination, and in determining the energy efficiency set forth in all Certification Reports submitted by or on behalf of this company. All information in such Certification Report(s) and in this Compliance Statement is true, accurate, and complete. The company pledges that all this information in any future Compliance Statement(s) and Certification Report(s) will meet these standards, and that the company will comply with the energy conservation requirements in 10 CFR Part 431 with regard to any new basic model it distributes in the future. The company is aware of the penalties associated with violations of the Act and the regulations thereunder, and is also aware of the provisions contained in 18 U.S.C. 1001, which prohibits knowingly making false statements to the Federal Government.

Name of Company Official: _____

Signature of Company Official: _____

Title: _____

Firm or Organization: _____

Date: _____

Name of Person to Contact for Further Information:

Address: _____

Telephone Number: _____

Facsimile Number: _____

Email: _____

Third-Party Representation (if applicable)

For certification reports prepared and submitted by a third-party organization under the provisions of 10 CFR Part 431, the company official who authorized said third-party representation is:

Name: _____

Title: _____

Address: _____

Telephone Number: _____

Facsimile Number: _____

Email: _____

The third-party organization authorized to act as representative:

Third-Party Organization: _____

Address: _____

Telephone Number: _____

Facsimile Number: _____

Email: _____

Submit by Certified Mail to: U.S. Department of Energy, Building Technologies Program, Mailstop EE–2J, 1000 Independence Avenue, SW, Washington, DC 20585–0121. Submit by e-mail in PDF format (which shows original signature) to the U.S. Department of Energy, Buildings Technologies Program at: *certification.report.@ee.doe.gov*.

[75 FR 10968, Mar. 9, 2010]

APPENDIX B TO SUBPART S TO PART 431—CERTIFICATION REPORT FOR METAL HALIDE LAMP BALLASTS

All information reported in this Certification Report(s) is true, accurate, and complete. The company is aware of the penalties associated with violations of the Act, the regulations thereunder, and is also aware of the provisions contained in 18 U.S.C. 1001, which prohibits knowingly making false statements to the Federal Government.

Name of Company Official or Third-Party Representative:

Signature of Company Official or Third-Party Representative:

Title:
Date:
Equipment Type:
Manufacturer:

Name of Person to Contact for Further Information:

Address:
Telephone Number:
Facsimile Number:
E-mail:

For Existing, New, or Modified Models: [Provide specific equipment information including, for each basic model, the product class, the manufacturer's model number(s), and the other information required in 431.327(a)(6)(i).]

For Discontinued Models: [Provide manufacturer's model number(s).]

Submit by Certified Mail to: U.S. Department of Energy, Building Technologies Program, Mailstop EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121. Submit by E-mail to: U.S. Department of Energy, Buildings Technologies Program, *certification.report@ee.doe.gov*.

[75 FR 10968, Mar. 9, 2010]

APPENDIX C TO SUBPART S OF PART 431—ENFORCEMENT FOR PERFORMANCE STANDARDS; COMPLIANCE DETERMINATION PROCEDURE FOR METAL HALIDE LAMP BALLASTS

DOE will determine compliance as follows:

(a) After it has determined the sample size, DOE will measure the energy performance for each unit in accordance with the following table:

Sample size	Number of tests for each unit
4	1
3	1
2	2
1	4

(b) Compute the mean of the measured energy performance (x_l) for all tests as follows:

$$x_l = \frac{1}{n_l}\left\{\sum_{i=1}^{n_l} x_i\right\} \qquad [1]$$

Where x_i is the measured energy efficiency or consumption from test i, and n_l is the total number of tests.

(c) Compute the standard deviation (S_l) of the measured energy performance from the n_l tests as follows:

$$S_l = \sqrt{\frac{\sum_{i=1}^{n_l}\left(x_i - x_l\right)^2}{n_l - 1}} \qquad [2]$$

(d) Compute the standard error (Sx_l) of the measured energy performance from the n_l tests as follows:

$$S_{x_l} = \frac{S_l}{\sqrt{n_l}} \qquad [3]$$

(e)(1) For an energy efficiency standard, compute the lower control limit (LCL_l) according to:

$$LCL_l = EPS - ts_{x_l} \qquad [4a]$$

or

$$LCL_l = 97.5\ EPS \qquad [4b]$$

(whichever is greater)

(2) For an energy use standard, compute the upper control limit (UCL_l) according to:

$$UCL_l = EPS + ts_{x_l} \qquad [5a]$$

or
(whichever is less)

$$UCL_l = 1.025\ EPS \qquad [5b]$$

Where EPS is the energy performance standard and t is a statistic based on a 99-percent, one-sided confidence limit and a sample size of n_l.

(f)(1) Compare the sample mean to the control limit. The basic model is in compliance and testing is at an end if, for an energy efficiency standard, the sample mean is equal to or greater than the lower control limit or, for an energy consumption standard, the sample mean is equal to or less than the upper control limit. If, for an energy efficiency standard, the sample mean is less than the lower control limit or, for an energy consumption standard, the sample mean is greater than the upper control limit, compliance has not been demonstrated. Unless the manufacturer requests manufacturer-option testing and provides the additional units for such testing, the basic model is in noncompliance, and the testing is at an end.

(2) If the manufacturer does request additional testing and provides the necessary additional units, DOE will test each unit the same number of times it tested previous units. DOE will then compute a combined sample mean, standard deviation, and standard error as described above. (The "combined sample" refers to the units DOE initially tested plus the additional units DOE has tested at the manufacturer's request.) DOE will determine compliance or noncompliance from the mean and the new lower or upper control limit of the combined sample. If, for an energy efficiency standard, the combined sample mean is equal to or greater than the new lower control limit or, for an energy consumption standard, the sample mean is equal to or less than the upper control limit, the basic model is in compliance and testing is at an end. If the combined sample mean

does not satisfy one of these two conditions, the basic model is not in compliance.

[75 FR 10968, Mar. 9, 2010]

Subpart T—Certification and Enforcement

SOURCE: 75 FR 669, Jan. 5, 2010, unless otherwise noted.

§ 431.370 Purpose and scope.

This subpart sets forth the procedures to be followed for manufacturer compliance certifications of all covered equipment except electric motors, and for the Department's enforcement action to determine whether a basic model of covered equipment, other than electric motors and distribution transformers, complies with the applicable energy or water conservation standard set forth in this part. Energy and water conservation standards include minimum levels of efficiency and maximum levels of consumption (also referred to as performance standards), and prescriptive design requirements (also referred to as design standards). This subpart does not apply to electric motors.

§ 431.371 Submission of data.

(a) *Certification.* (1) Except as provided in paragraph (a)(2) of this section, each manufacturer or private labeler before distributing into the stream of commerce any basic model of covered equipment covered by this subpart and subject to an energy or water conservation standard set forth in this part, shall certify by means of a compliance statement and a certification report that each basic model meets the applicable energy or water conservation standard. Except as provided in paragraph (a)(2) of this section, each manufacturer or private labeler shall file a compliance statement and its first certification report with the Department on or before (180 days after the Department of Energy publishes a document in the FEDERAL REGISTER announcing OMB approval of the information collection requirements in § 431.371). The compliance statement, signed by the company official submitting the statement, and the certification report(s) shall be sent by certified mail to: U.S. Department of Energy, Building Technologies Program, Mailstop EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121, or e-mailed to the Department at: *certification.report@ee.doe.gov*.

(2) Each manufacturer or private labeler of a basic model of commercial clothes washer, distribution transformer, traffic signal module, pedestrian module, and commercial prerinse spray valve shall file a compliance statement and its first certification report with the Department on or before (180 days after the Department of Energy publishes a document in the FEDERAL REGISTER announcing OMB approval of the information collection requirements in § 431.371).

(3) *Amendment of information.* If information in a compliance statement or certification report previously submitted to the Department under this section is found to be incorrect, each manufacturer or private labeler (or an authorized representative) must submit the corrected information to the Department at the address and in the manner described in this section.

(4) Notices designating a change of third-party representative must be sent to the Department at the address and in the manner described in this section.

(5) The compliance statement, which each manufacturer or private labeler need not submit more than once unless the information on the report changes, shall include all information specified in the format set forth in appendix A of this subpart and shall certify, with respect to each basic model currently produced by the manufacturer and new basic models it introduces in the future, that:

(i) Each basic model complies and will comply with the applicable energy or water conservation standard;

(ii) All representations as to efficiency in the manufacturer's certification report(s) are and will be based on testing and/or use of an AEDM in accordance with 10 CFR Part 431;

(iii) All information reported in the certification report(s) is and will be true, accurate, and complete; and

(iv) The manufacturer or private labeler 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.

(6) Each manufacturer must submit to the Department a certification report for all of its basic models.

(i) For covered equipment that are subject to standards other than distribution transformers and electric motors, the certification report (for which a suggested format is set forth in appendix B of this subpart) shall include for each basic model the product type, product class, manufacturer's name, private labeler's name(s) (if applicable), and the manufacturer's model number(s), and:

(A) The thermal efficiency as a percentage and the maximum rated capacity (rated maximum input) in Btu/h of commercial warm air furnaces;

(B) The combustion efficiency as a percentage and the capacity (rated maximum input) in Btu/h of commercial package boilers;

(C) The seasonal energy efficiency ratio and the cooling capacity in Btu/h of small commercial, air cooled, three-phase, packaged air conditioners less than 65,000 Btu/h;

(D) The energy efficiency ratio and the cooling capacity in Btu/h of small commercial water-cooled and evaporatively cooled packaged air conditioners less than 65,000 Btu/h;

(E) The energy efficiency ratio and the cooling capacity in Btu/h of large and very large commercial air cooled, water-cooled, and evaporatively cooled packaged air conditioners;

(F) The energy efficiency ratio and the cooling capacity in Btu/h of packaged terminal air conditioners;

(G) The seasonal energy efficiency ratio, the heating seasonal performance factor and the cooling capacity in Btu/h of small commercial air cooled, three-phase packaged air conditioning heat pumps less than 65,000 Btu/h;

(H) The energy efficiency ratio, the coefficient of performance and the cooling capacity in Btu/h of small commercial water-source packaged air conditioning heat pumps;

(I) The energy efficiency ratio, the coefficient of performance and the cooling capacity in Btu/h of large and very large air cooled commercial package air conditioning heat pumps;

(J) The energy efficiency ratio, coefficient of performance and the cooling capacity in Btu/h of packaged terminal heat pumps;

(K) The maximum standby loss in percent per hour of electric storage water heaters;

(L) The minimum thermal efficiency in percent, the maximum standby loss in Btu/h, and the size (input capacity) in Btu/h of gas- and oil-fired storage water heaters;

(M) The minimum thermal efficiency in percent, maximum standby loss in Btu/h, and the size (storage capacity) in gallons of gas- and oil-fired instantaneous water heaters and gas- and oil-fired hot water supply boilers greater than or equal to 10 gallons;

(N) The minimum thermal efficiency in percent and the size (storage capacity) in gallons of gas- and oil-fired instantaneous water heaters and gas- and oil-fired hot water supply boilers less than 10 gallons;

(O) The minimum thermal insulation and the storage capacity of unfired hot water storage tanks;

(P) The maximum daily energy consumption in kilowatt hours per day and volume in cubic feet of refrigerators with solid doors, refrigerators with transparent doors, freezers with solid doors, and freezers with transparent doors;

(Q) The maximum daily energy consumption in kilowatt hours per day and adjusted volume in cubic feet of refrigerator-freezers with solid doors;

(R) The equipment type, type of cooling, maximum energy use in kilowatt hours per 100 pounds of ice, maximum condenser water use in gallons per 100 pounds of ice, and harvest rate in pounds of ice per 24 hours of commercial ice makers;

(S) The modified energy factor and water consumption factor of commercial clothes washers;

(T) The input power demand in watts of illuminated exit signs;

(U) The nominal and maximum wattage in watts and signal type of traffic signal modules and pedestrian modules; and

(V) The flow rate in gallons per minute of commercial prerinse spray valves.

(ii) For the least efficient basic model of distribution transformer within each "kilovolt ampere (kVA) grouping" for which this part prescribes an efficiency standard, the certification report (for which a suggested format is set forth in appendix C of this subpart shall include 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), the basic impulse insulation level (BIL) group rating (for medium-voltage dry-types), the model number(s), the efficiency, and the method used to determine the efficiency (*i.e.*, actual testing or an AEDM). 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 96 kV BIL).

(7) Copies of reports to the Federal Trade Commission that include the information specified in paragraph (a)(6) of this section could serve in lieu of the certification report.

(b) *Model Modifications.* Any change to a basic model that affects energy or water consumption (in the case of prerinse spray valves) constitutes the addition of a new basic model. If such a change reduces consumption, the new model shall be considered in compliance with the standard without any additional testing. If, however, such a change increases consumption while meeting the standard, then

(1) For distribution transformers, the manufacturer must submit all information required by paragraph (a)(6)(ii) 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, and that has a lower efficiency than the new basic model;

(2) For other equipment, the manufacturer must submit all information required by paragraph (a)(6) of this section for the new basic model; and

(3) Any such submission shall be by certified mail, to: Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585–0121, or e-mailed to the Department at: *certification.report@ee.doe.gov*.

(c) *Discontinued model.* For equipment other than distribution transformers, when production of a basic model has ceased and is no longer being distributed, the manufacturer shall report this, by certified mail, to: U.S. Department of Energy, Building Technologies Program, Mailstop EE–2J, 1000 Independence Avenue, SW., Washington, DC 20585–0121, or e-mailed to the Department at: *certification.report@ee.doe.gov*. For each basic model, the report shall include: equipment type, equipment class, the manufacturer's name, the private labeler's name(s), if applicable, and the manufacturer's model number. If the reporting of discontinued models coincides with the submittal of a certification report, such information can be included in the certification report.

(d) *Third-party representation.* A manufacturer or private labeler may elect to use a third party (such as a trade association or other authorized representative) to submit the certification report to the Department. Such certification reports shall include all the information specified in paragraph (a)(6) of this section. Third parties submitting certification reports shall include the names of the manufacturers or private labelers who authorized the submittal of the certification reports to the Department on their behalf. The third-party representative also may submit discontinued model information on behalf of an authorizing manufacturer.

[75 FR 669, Jan. 5, 2010]

EFFECTIVE DATE NOTE: At 75 FR 669, Jan. 5, 2010, §431.371 was added. This section contains information collection and recordkeeping requirements and will not become effective until approval has been given by the Office of Management and Budget.

§ 431.372 Sampling.

For purposes of a certification of compliance, the determination that a basic model complies with the applicable energy conservation standard or water conservation standard shall be based upon the testing and sampling procedures, and other applicable rating procedures set forth in this part. For purposes of a certification of compliance, the determination that a basic model complies with the applicable design standard shall be based on the incorporation of specific design requirements specified in this part.

§ 431.373 Enforcement.

For covered equipment other than electric motors, this section sets forth procedures the Department will follow in pursuing alleged non-compliance with an applicable energy or water conservation standard. Paragraph (c) of this section applies to all such covered equipment, paragraphs (a)(1) and (a)(2) of this section apply to all such equipment except for distribution transformers and commercial heating, ventilating, and air conditioning equipment and commercial water heating equipment.

(a) *Performance standards*—(1) *Test notice.* Upon receiving information in writing concerning the energy performance or water performance (in the case of commercial prerinse spray valves) of a particular covered equipment sold by a particular manufacturer or private labeler, which indicates that the covered equipment may not be in compliance with the applicable energy- or water-performance standard, the Secretary may conduct a review of the test records. The Secretary may then conduct enforcement testing of that equipment by means of a test notice addressed to the manufacturer or private labeler in accordance with the following requirements:

(i) The test notice procedure will only be followed after the Secretary or his/her designated representative has examined the underlying test data (or, where appropriate, data about the use of an alternative efficiency determination method (AEDM)) provided by the manufacturer, and after the manufacturer has been offered the opportunity to meet with the Department to verify compliance with the applicable energy conservation standard or water conservation standard. When compliance of a basic model was certified based on an AEDM, the Department has the discretion to pursue other steps provided under this part for verifying the AEDM before invoking the test notice procedure. A representative designated by the Secretary must be permitted to observe any reverification procedures undertaken according to this subpart, and to inspect the results of such reverification.

(ii) The test notice will be signed by the Secretary or his/her designee and will be mailed or delivered by the Department to the plant manager or other responsible official designated by the manufacturer.

(iii) The test notice will specify the model or basic model to be selected for testing, the number of units to be tested, the method for selecting these units, the date and time at which testing is to begin, the date when testing is scheduled to be 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 it may include alternative basic models. For equipment that this part allows to be rated by use of an AEDM, the specified basic model may be one that the manufacturer has rated by actual testing or that it has rated by the use of an AEDM.

(iv) The Secretary may require in the test notice that the manufacturer of a covered equipment shall ship at his expense a reasonable number of units of each basic model specified in the test notice to a testing laboratory designated by the Secretary. The number of units of a basic model specified in a test notice shall not exceed 20.

(v) Within five working days of the time the units are selected, the manufacturer must ship the specified test units of a basic model to the designated testing laboratory.

(2) *Testing laboratory.* Whenever the Department conducts enforcement testing at a designated laboratory in accordance with a test notice under this section, the resulting test data shall constitute official test data for that basic model. The Department will

use such test data to make a determination of compliance or noncompliance.

(3) *Sampling*. The Secretary will base the determination of whether a manufacturer's basic model complies with the applicable energy- or water-performance standard on testing conducted in accordance with the applicable test procedures specified in this part, and with the following statistical sampling procedures:

(i) For commercial prerinse spray valves, illuminated exit signs, traffic signal modules and pedestrian modules, refrigerated bottled or canned vending machines, and commercial clothes washers, the methods are described in appendix B to subpart F of part 430 (Sampling Plan for Enforcement Testing).

(ii) For automatic commercial ice makers, as well as commercial refrigerators, freezers, and refrigerator-freezers, the methods are described in appendix D to subpart T of part 431 and include the following provisions:

(A) Except as required or provided in paragraphs (a)(3)(ii)(B) and (a)(3)(ii)(C) of this section, initially, the Department will test two units.

(B) Except as provided in paragraph (a)(3)(ii)(C) of this section, if fewer than two units of basic model are available for testing when the manufacturer receives the test notice, then:

(*1*) If only one unit of a basic model is available for testing, the Department will test that unit, and will base the compliance determination on the results for that unit in a manner otherwise in accordance with this section. Available units are those, which are available for commercial distribution within the United States.

(*2*) If a basic model is very large or has unusual testing requirements, the Department may decide to base the determination of compliance on the testing of one unit, if the manufacturer so requests and provides sufficient justification for the request.

(*i*) The available unit(s) and one or more of the other units that subsequently become available (up to a maximum of four); or

(*ii*) Up to four of the other units that subsequently become available.

(C) Notwithstanding paragraphs (a)(3)(ii)(A) and (a)(3)(ii)(B) 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 is very large, has unusual testing requirements, or has limited production, the Department may in its discretion decide to base the determination of compliance on the testing of fewer than the available number of units, if the manufacturer so requests and demonstrates that the criteria of this paragraph are met.

(iii) For commercial HVAC and WH products, the methods are described in appendix D to subpart T of part 431 and include the following provisions:

(A) Except as required or provided in paragraphs (a)(3)(iii)(B) and (a)(3)(iii)(C) of this section, initially, the Department will test two units.

(B) Except as provided in paragraph (a)(3)(iii)(C) of this section, if fewer than two units of basic model are available for testing when the manufacturer receives the test notice, then:

(*1*) The Department will test the available unit(s); or

(*2*) If one or more other units of the basic model are expected to become available within six months, the Department may instead at its discretion, test either:

(*i*) The available unit(s) and one or more of the other units that subsequently become available (up to a maximum of four); or

(*ii*) Up to four of the other units that subsequently become available.

(C) Notwithstanding paragraphs (a)(3)(iii)(A) and (a)(3)(iii)(B) 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 is very large, has unusual testing requirements, or has limited production, the Department may in its discretion decide to base the determination of compliance on the testing of fewer than the available number of units, if the manufacturer so requests and demonstrates that the criteria of this paragraph are met.

(iv) For the purposes of paragraphs (a)(3)(ii)(A) through (a)(3)(ii)(C) and (a)(3)(iii)(A) through (a)(3)(iii)(C) of

this section, when it tests three or fewer units, the Department will base the compliance determination on the results of such testing in a manner otherwise in accordance with this section.

(v) For the purposes of paragraphs (a)(3)(ii)(A) through (a)(3)(ii)(C) and (a)(3)(iii)(A) through (a)(3)(iii)(C) of this section, available units are those that are available for commercial distribution within the United States.

(4) *Test unit selection.* (i) For commercial prerinse spray valves, illuminated exit signs, traffic signal modules and pedestrian modules, refrigerated bottled or canned vending machines, and commercial clothes washers, the following applies:

(A) The Department shall select a batch, a batch sample, and test units from the batch sample in accordance with the following provisions of this paragraph and the conditions specified in the test notice.

(B) The batch may be subdivided by the Department using criteria specified in the test notice.

(C) The Department will then randomly select a batch sample of up to 20 units from one or more subdivided groups within the batch. The manufacturer shall keep on hand all units in the batch sample until the basic model is determined to be in compliance or non-compliance.

(D) The Department will randomly select individual test units comprising the test sample from the batch sample.

(E) All random selection shall be achieved by sequentially numbering all of the units in a batch sample and then using a table of random numbers to select the units to be tested.

(ii) For automatic commercial ice makers, as well as commercial refrigerators, freezers, and refrigerator-freezers, the following applies:

(A) The Department will select a batch from all available units, and a test sample (*i.e.*, the units to be tested) from the batch, in accordance with the provisions of this paragraph and the conditions specified in the test notice.

(B) The Department may select the batch by utilizing the criteria specified in the test notice (date of manufacture, component-supplier, location of manufacturing facility, or other criteria) which may differentiate one unit from another within a basic model.

(C) The Department will randomly select individual units to be tested, comprising the test sample, from the batch. The Department will achieve random selection by sequentially numbering all of the units in a batch and then using a table of random numbers to select the units to be tested. The manufacturer must keep on hand all units in the batch until such time as the inspector determines that the unit(s) selected for testing is (are) operative. Thereafter, once a manufacturer distributes or otherwise disposes of any unit in the batch, it may no longer claim under paragraph (a)(5)(iii) of this section that a unit selected for testing is defective due to a manufacturing defect or failure to operate in accordance with its design and operating instructions.

(5) *Test unit preparation.* (i) Before and during the testing, a test unit selected in accordance with paragraph (a)(4) of this section shall not be prepared, modified, or adjusted in any manner unless such preparation, modification, or adjustment is allowed by the applicable Department test procedure. The Department will test each unit in accordance with the applicable test procedures.

(ii) No one may perform any quality control, testing, or assembly procedures 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.

(iii) A test unit shall be considered defective if it is inoperative. A test unit is also defective if it is found to be in noncompliance due to a manufacturing defect or due to failure of the unit to operate according to the manufacturer's design and operating instructions, and the manufacturer demonstrates by statistically valid means that, with respect to such defect or failure, the unit is not representative of the population of production units from which it is obtained. Defective units, including those damaged due to shipping or handling, must be reported immediately to the Department. The Department will authorize testing of

an additional unit on a case-by-case basis.

(6) *Testing at manufacturer's option.* (i) If the Department determines a basic model to be in noncompliance with the applicable energy performance standard or water performance standard at the conclusion of its initial enforcement sampling plan testing, the manufacturer may request that the Department conduct additional testing of the basic model. Additional testing under this paragraph must be in accordance with the applicable test procedure, and:

(A) For commercial prerinse spray valves, illuminated exit signs, traffic signal modules and pedestrian modules, refrigerated bottled or canned vending machines, and commercial clothes washers, the applicable provisions in appendix B to subpart F of part 430;

(B) For automatic commercial ice makers, as well as commercial refrigerators, freezers, and refrigerator-freezers, the applicable provisions in appendix D to subpart T of part 431, and limited to a maximum of six additional units of basic model.

(ii) All units tested under this paragraph shall be selected and tested in accordance with paragraphs (a)(1)(v), (a)(2), (a)(4), and (a)(5) of this section.

(iii) The manufacturer shall bear the cost of all testing under this paragraph.

(iv) The Department will advise the manufacturer of the method for selecting the additional units for testing, the date and time at which testing is to begin, the date by which testing is scheduled to be completed, and the facility at which the testing will occur.

(v) The manufacturer shall cease distribution of the basic model tested under the provisions of this paragraph from the time the manufacturer elects to exercise the option provided in this paragraph until the basic model is determined to be in compliance. The Department may seek civil penalties for all units distributed during such period.

(vi) If the additional testing results in a determination of compliance, the Department will issue a notice of allowance to resume distribution.

(b) *Design standard.* In the case of a design standard, the Department can determine that a model is noncompliant after the Department has examined the underlying design information from the manufacturer and has offered the manufacturer the opportunity to verify compliance with the applicable design standard.

(c) *Cessation of distribution of a basic model of commercial equipment other than electric motors.* (1) In the event the Department determines, in accordance with enforcement provisions set forth in this subpart, a model of covered equipment is noncompliant, or if a manufacturer or private labeler determines one of its models to be in noncompliance, the manufacturer or private labeler shall:

(i) Immediately cease distribution in commerce of all units of the basic model in question;

(ii) 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

(iii) If requested by the Secretary, provide the Department within 30 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.

(2) The manufacturer may modify the noncompliant basic model in such manner as to make it comply with the applicable performance standard. The manufacturer or private labeler must treat such a modified basic model as a new basic model and certify it in accordance with the provisions of this subpart. In addition to satisfying all requirements of this subpart, the manufacturer must also maintain records that demonstrate that modifications have been made to all units of the new basic model before its distribution in commerce.

(3) If a manufacturer or private labeler has a basic model that is not properly certified in accordance with the requirements of this subpart, the Secretary may seek, among other remedies, injunctive action to prohibit distribution in commerce of the basic model.

[75 FR 669, Jan. 5, 2010; 75 FR 4475, Jan. 28, 2010]

APPENDIX A TO SUBPART T OF PART 431—COMPLIANCE STATEMENT FOR CERTAIN COMMERCIAL EQUIPMENT

Equipment Type:

Manufacturer's or Private Labeler's Name and Address:

[Company name] ("the company") submits this Compliance Statement under 10 CFR Part 431 (Energy Efficiency Program for Certain Commercial and Industrial Equipment) and Part C of the Energy Policy and Conservation Act (Pub. L. 94–163), and amendments thereto. I am signing this on behalf of and as a responsible official of the company. All basic models of commercial or industrial equipment subject to energy conservation standards specified in 10 CFR part 431 that this company manufacturers comply with the applicable energy or water conservation standard(s). We have complied with the applicable testing requirements (prescribed in 10 CFR part 431) in making this determination, and in determining the energy efficiency, energy use, or water use that is set forth in any accompanying Certification Report. All information in such Certification Report(s) and in this Compliance Statement is true, accurate, and complete. The company pledges that all this information in any future Compliance Statement(s) and Certification Report(s) will meet these standards, and that the company will comply with the energy conservation requirements in 10 CFR part 431 with regard to any new basic model it distributes in the future. The company is aware of the penalties associated with violations of the Act and the regulations there under, and is also aware of the provisions contained in 18 U.S.C. 1001, which prohibits knowingly making false statements to the Federal Government.

Name of Company Official:
Signature of Company Official:

Title:
Firm or Organization:
Date:
Name of Person to Contact for Further Information:
Address:

Telephone Number:
Facsimile Number:

Third-Party Representation (if applicable)

For a certification report prepared and submitted by a third-party organization under the provisions of 10 CFR part 431, the company official who authorized said third-party representation is:

Name:
Title:
Address:

Telephone Number:
Facsimile Number:

The third-party organization authorized to act as representative:
Third-Party Organization:
Address:

Telephone Number:
Facsimile Number:

The Compliance Statement needs to be resubmitted if information on the form changes.

APPENDIX B TO SUBPART T OF PART 431—CERTIFICATION REPORT FOR CERTAIN COMMERCIAL EQUIPMENT

All information reported in this Certification Report(s) is true, accurate, and complete. The company is aware of the penalties associated with violations of the Act, the regulations hereunder, and is also aware of the provisions contained in 18 U.S.C. 1001, which prohibits knowingly making false statements to the Federal Government.

Name of Company Official or Third-Party Representative:
Signature of Company Official or Third-Party Representative:

Title:
Date:
Equipment Type:
Manufacturer:
Private Labeler (if applicable):
Name of Person to Contact for Further Information:
Address:

Telephone Number:
Facsimile Number:
For Existing, New, or Modified Models: [1]
For Discontinued Models: [2]

Submit by Certified Mail to: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, Mailstop EE–2J, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585–0121.

Submit by E-mail to: *certification.report@ee.doe.gov*.

[1] Provide specific equipment information for each basic model required in 431.371(a)(6)(i), including the product class and manufacturer's model number(s).

[2] Provide manufacturer's model number(s).

APPENDIX C TO SUBPART T OF PART 431—CERTIFICATION REPORT FOR DISTRIBUTION TRANSFORMERS

All information reported in this Certification Report(s) is true, accurate, and complete. The company is aware of the penalties associated with violations of the Act, the regulations thereunder, and is also aware of the provisions contained in 18 U.S.C. 1001, which prohibits knowingly making false statements to the Federal Government.

Name of Company Official or Third-Party Representative: _____

Signature of Company Official or Third-Party Representative: _____

Title: _____

Date: _____

Equipment Type: _____

Manufacturer: _____

Private Labeler (if applicable): _____

Name of Person to Contact for Further Information: _____

Address: _____

Telephone Number: _____

Facsimile Number: _____

For Existing, New, or Modified Models: [1]

Prepare tables that will list distribution transformer efficiencies. Each table should have a heading that provides the name of the manufacturer, as well as the type of transformer (*i.e.*, low-voltage dry-type, liquid-immersed, or medium-voltage dry-type) and the number of phases for the transformers reported in that table. Each table should also have five columns, labeled "kVA rating," "BIL rating" for medium-voltage units, "Least efficient basic model (model number(s))," "Efficiency (%)" and "Test Method Used." Each table should have one row for each of the kVA groups that are produced by the manufacturer and that are subject to minimum efficiency standards. In the "Test Method Used" column, the manufacturer should report whether the efficiency of the reported least efficient basic model in that kVA grouping was determined by testing or through the application of an alternative efficiency determination method.

Submit by Certified Mail to: U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, Mailstop EE–2J), Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585–0121.

Submit by E-mail to: *certification.report@ee.doe.gov*.

APPENDIX D TO SUBPART T OF PART 431—ENFORCEMENT FOR PERFORMANCE STANDARDS; COMPLIANCE DETERMINATION PROCEDURE FOR CERTAIN COMMERCIAL EQUIPMENT

The Department will determine compliance as follows:

(a) The first sample size (n_1) must be four or more units, except as provided by §431.373(a)(3).

(b) Compute the mean of the measured energy performance (x_1) for all tests as follows:

$$x_1 = \frac{1}{n_1}\left(\sum_{i=1}^{n_1} x_i\right) \qquad [1]$$

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:

$$s_1 = \sqrt{\frac{\sum_{i=1}^{n_1}\left(x_i - x_1\right)^2}{n_1 - 1}} \qquad [2]$$

(d) Compute the standard error (s_{x1}) of the measured energy performance from the n_1 tests as follows:

$$s_{x_1} = \frac{s_1}{\sqrt{n_1}} \qquad [3]$$

(e)(1) For an energy efficiency standard, compute the lower control limit (LCL_1) according to:

$$LCL_1 = EPS - ts_{x_1} \qquad [4a]$$

or

$$LCL_1 = 95.0EPS, \text{ (whichever is greater).} \qquad [4b]$$

(2) For an energy use standard, compute the upper control limit (UCL1) according to:

$$UCL_1 = EPS + ts_{x_1} \qquad [5a]$$

or

$$UCL_1 = 1.05EPS, \text{ (whichever is less),} \qquad [5b]$$

where EPS is the energy performance 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. The basic model is in compliance and testing is at an end if, for an energy efficiency standard, the sample mean is equal to or greater than the lower control limit or, for an energy consumption standard, the sample mean is equal to or less than the upper control limit. If, for an energy efficiency standard, the sample mean is less than the lower control limit or, for an energy consumption standard, the sample mean is greater than the upper control limit, compliance has not been demonstrated. Unless the manufacturer requests manufacturer-option testing and provides the additional units for such testing, the basic model is in noncompliance and the testing is at an end.

(2) If the manufacturer does request additional testing, and provides the necessary additional units, the Department will test each unit the same number of times it tested previous units. The Department will then compute a combined sample mean, standard deviation, and standard error as described above. (The "combined sample" refers to the units the Department initially tested plus the additional units the Department has tested at the manufacturer's request.) The Department will determine compliance or noncompliance from the mean and the new lower or upper control limit of the combined sample. If, for an energy efficiency standard, the combined sample mean is equal to or greater than the new lower control limit or, for an energy consumption standard, the sample mean is equal to or less than the upper control limit, the basic model is in compliance, and testing is at an end. If the combined sample mean does not satisfy one of these two conditions, the basic model is in noncompliance and the testing is at an end.

Subpart U—Enforcement

SOURCE: 69 FR 61941, Oct. 21, 2004, unless otherwise noted. Redesignated at 70 FR 60416, Oct. 18, 2005.

§ 431.381 Purpose and scope.

This subpart describes violations of EPCA's energy conservation requirements, specific procedures we will follow in pursuing alleged non-compliance of an electric motor with an applicable energy conservation standard or labeling requirement, and general procedures for enforcement action, largely drawn directly from EPCA, that apply to both electric motors and commercial HVAC & WH products.

§ 431.382 Prohibited acts.

(a) Each of the following is a prohibited act under sections 332 and 345 of the Act:

(1) Distribution in commerce by a manufacturer or private labeler of any "new covered equipment" which is not labeled in accordance with an applicable labeling rule prescribed in accordance with Section 344 of the Act, and in this part;

(2) Removal from any "new covered equipment" or rendering illegible, by a manufacturer, distributor, retailer, or private labeler, of any label required under this Part to be provided with such covered equipment;

(3) Failure to 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;

(4) Advertisement of an electric motor or motors, by a manufacturer, distributor, retailer, or private labeler, in a catalog from which the equipment may be purchased, without including in the catalog all information as required by § 431.31(b)(1), provided, however, that this shall not apply to an advertisement of an electric motor in a catalog if distribution of the catalog began before the effective date of the labeling rule applicable to that motor;

(5) Failure of a manufacturer to supply at his expense a reasonable number of units of covered equipment to a test laboratory designated by the Secretary;

(6) Failure of a manufacturer to permit a representative designated by the Secretary to observe any testing required by the Act and this part, and to inspect the results of such testing; and

(7) Distribution in commerce by a manufacturer or private labeler of any new covered equipment which is not in compliance with an applicable energy efficiency standard prescribed under the Act and this part.

(b) In accordance with sections 333 and 345 of the Act, any person who knowingly violates any provision of paragraph (a) of this section may be subject to assessment of a civil penalty of no more than $110 for each violation. Each violation of paragraphs (a)(1), (2), and (7) of this section shall constitute a separate violation with respect to each unit of any covered equipment, and each day of noncompliance with paragraphs (a)(3) through (6) of this section shall constitute a separate violation.

(c) For purposes of this section:

(1) The term "new covered equipment" means covered equipment the title of which has not passed to a purchaser who buys such product for purposes other than:

(i) Reselling it; or

(ii) Leasing it for a period in excess of one year; and

(2) The term "knowingly" means:

(i) Having actual knowledge; or

(ii) Presumed to have knowledge deemed to be possessed by a reasonable person who acts in the circumstances, including knowledge obtainable upon the exercise of due care.

§ 431.383 Enforcement process for electric motors.

(a) *Test notice.* Upon receiving information in writing, concerning the energy performance of a particular electric motor sold by a particular manufacturer or private labeler, which indicates that the electric motor may not be in compliance with the applicable energy efficiency standard, or upon undertaking to ascertain the accuracy of the efficiency rating on the nameplate or in marketing materials for an electric motor, disclosed pursuant to subpart B of this part, the Secretary may conduct testing of that electric motor under this subpart by means of a test

notice addressed to the manufacturer in accordance with the following requirements:

(1) The test notice procedure will only be followed after the Secretary or his/her designated representative has examined the underlying test data (or, where appropriate, data as to use of an alternative efficiency determination method) provided by the manufacturer and after the manufacturer has been offered the opportunity to meet with the Department to verify, as applicable, compliance with the applicable efficiency standard, or the accuracy of labeling information, or both. In addition, where compliance of a basic model was certified based on an AEDM, the Department shall have the discretion to pursue the provisions of § 431.17(a)(4)(iii) prior to invoking the test notice procedure. A representative designated by the Secretary shall be permitted to observe any reverification procedures undertaken pursuant to this subpart, and to inspect the results of such reverification.

(2) The test notice will be signed by the Secretary or his/her designee. The test notice will be mailed or delivered by the Department to the plant manager or other responsible official, as designated by the manufacturer.

(3) The test notice will specify the model or basic model to be selected for testing, the method of selecting the test sample, the date and time at which testing shall be initiated, the date by which testing is scheduled to be completed and the facility at which testing will be conducted. The test notice may also provide for situations in which the specified basic model is unavailable for testing, and may include alternative basic models.

(4) The Secretary may require in the test notice that the manufacturer of an electric motor shall ship at his expense a reasonable number of units of a basic model specified in such test notice to a testing laboratory designated by the Secretary. The number of units of a basic model specified in a test notice shall not exceed 20.

(5) Within five working days of the time the units are selected, the manufacturer shall ship the specified test units of a basic model to the testing laboratory.

(b) *Testing laboratory.* Whenever the Department conducts enforcement testing at a designated laboratory in accordance with a test notice under this section, the resulting test data shall constitute official test data for that basic model. Such test data will be used by the Department to make a determination of compliance or noncompliance if a sufficient number of tests have been conducted to satisfy the requirements of appendix A of this subpart.

(c) *Sampling.* The determination that a manufacturer's basic model complies with its labeled efficiency, or the applicable energy efficiency standard, shall be based on the testing conducted in accordance with the statistical sampling procedures set forth in appendix A of this subpart and the test procedures set forth in appendix B to subpart B of this part.

(d) *Test unit selection.* A Department inspector shall select a batch, a batch sample, and test units from the batch sample in accordance with the provisions of this paragraph and the conditions specified in the test notice.

(1) The batch may be subdivided by the Department utilizing criteria specified in the test notice.

(2) A batch sample of up to 20 units will then be randomly selected from one or more subdivided groups within the batch. The manufacturer shall keep on hand all units in the batch sample until such time as the basic model is determined to be in compliance or noncompliance.

(3) Individual test units comprising the test sample shall be randomly selected from the batch sample.

(4) All random selection shall be achieved by sequentially numbering all of the units in a batch sample and then using a table of random numbers to select the units to be tested.

(e) *Test unit preparation.* (1) Prior to and during the testing, a test unit selected in accordance with paragraph (d) of this section shall not be prepared, modified, or adjusted in any manner unless such preparation, modification, or adjustment is allowed by the applicable Department of Energy test procedure. One test shall be conducted for each test unit in accordance with the

applicable test procedures prescribed in appendix B to subpart B of this part.

(2) No quality control, testing, or assembly procedures shall be performed on a test unit, or any parts and sub-assemblies 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 the Department. The Department shall authorize testing of an additional unit on a case-by-case basis.

(f) *Testing at manufacturer's option.* (1) If a manufacturer's basic model is determined to be in noncompliance with the applicable energy performance standard at the conclusion of Department testing in accordance with the sampling plan specified in appendix A of this subpart, the manufacturer may request that the Department conduct additional testing of the basic model according to procedures set forth in appendix A of this subpart.

(2) All units tested under this paragraph shall be selected and tested in accordance with the provisions given in paragraphs (a) through (e) of this section.

(3) The manufacturer shall bear the cost of all testing conducted under this paragraph.

(4) The manufacturer shall cease distribution of the basic model tested under the provisions of this paragraph from the time the manufacturer elects to exercise the option provided in this paragraph until the basic model is determined to be in compliance. The Department may seek civil penalties for all units distributed during such period.

(5) If the additional testing results in a determination of compliance, a notice of allowance to resume distribution shall be issued by the Department.

§ 431.384 [Reserved]

§ 431.385 Cessation of distribution of a basic model of an electric motor.

(a) In the event that a model of an electric motor is determined non-compliant by the Department in accordance with § 431.192 or if a manufacturer or private labeler determines a model of an electric motor to be in noncompliance, then the manufacturer or private labeler shall:

(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.

(3) Pursuant to a request made by the Secretary, provide the Department within 30 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.

(4) The manufacturer may modify the non-compliant basic model in such manner as to make it comply with the applicable performance 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 subpart; except that in addition to satisfying all requirements of this subpart, the manufacturer shall also maintain records that demonstrate that modifications have been made to all units of the new basic model prior to distribution in commerce.

(b) If a basic model is not properly certified in accordance with the requirements of this subpart, the Secretary may seek, among other remedies, injunctive action to prohibit distribution in commerce of such basic model.

§ 431.386 Remedies.

If the Secretary determines that a basic model of any covered equipment does not comply with an applicable energy conservation standard:

(a) The Secretary will notify the manufacturer, private labeler, or any

other person as required, of this finding and of the Secretary's intent to seek a judicial order restraining further distribution in commerce of units of such a basic model unless the manufacturer, private labeler or other person as required, delivers, within 15 calendar days, a satisfactory statement to the Secretary, of the steps the manufacturer, private labeler or other person will take to insure that the noncompliant basic model will no longer be distributed in commerce. The Secretary will monitor the implementation of such statement.

(b) If the manufacturer, private labeler or any other person as required, fails to stop distribution of the noncompliant basic model, the Secretary may seek to restrain such violation in accordance with sections 334 and 345 of the Act.

(c) The Secretary will determine whether the facts of the case warrant the assessment of civil penalties for knowing violations in accordance with sections 333 and 345 of the Act.

§ 431.387 Hearings and appeals.

(a) Under sections 333(d) and 345 of the Act, before issuing an order assessing a civil penalty against any person, the Secretary must provide to such a person a notice of the proposed penalty. Such notice must inform the person that such person can choose (in writing within 30 days after receipt of the notice) to have the procedures of paragraph (c) of this section (in lieu of those in paragraph (b) of this section) apply with respect to such assessment.

(b)(1) Unless a person elects, within 30 calendar days after receipt of a notice under paragraph (a) of this section, to have paragraph (c) of this section apply with respect to the civil penalty under paragraph (a), the Secretary will assess the penalty, by order, after providing an opportunity for an agency hearing under 5 U.S.C. 554, before an administrative law judge appointed under 5 U.S.C. 3105, and making a determination of violation on the record. Such assessment order will include the administrative law judge's findings and the basis for such assessment.

(2) Any person against whom the Secretary assesses a penalty under this paragraph may, within 60 calendar days after the date of the order assessing such penalty, initiate action in the United States Court of Appeals for the appropriate judicial circuit for judicial review of such order in accordance with 5 U.S.C. chapter 7. The court will have jurisdiction to enter a judgment affirming, modifying, or setting aside in whole or in part, the order of the Secretary, or the court may remand the proceeding to the Secretary for such further action as the court may direct.

(c)(1) In the case of any civil penalty with respect to which the procedures of this paragraph have been elected, the Secretary will promptly assess such penalty, by order, after the date of the receipt of the notice under paragraph (a) of this section of the proposed penalty.

(2) If the person has not paid the civil penalty within 60 calendar days after the assessment has been made under paragraph (c)(1) of this section, the Secretary will institute an action in the appropriate District Court of the United States for an order affirming the assessment of the civil penalty. The court will have authority to review de novo the law and the facts involved and jurisdiction to enter a judgment enforcing, modifying, and enforcing as so modified, or setting aside in whole or in part, such assessment.

(3) Any election to have this paragraph apply can only be revoked with the consent of the Secretary.

(d) If any person fails to pay an assessment of a civil penalty after it has become a final and unappealable order under paragraph (b) of this section, or after the appropriate District Court has entered final judgment in favor of the Secretary under paragraph (c) of this section, the Secretary will 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 will not be subject to review.

(e)(1) In accordance with the provisions of sections 333(d)(5)(A) and 345 of the Act and notwithstanding the provisions of title 28, United States Code, or Section 502(c) of the Department of Energy Organization Act, the General Counsel of the Department of Energy

(or any attorney or attorneys within DOE designated by the Secretary) will represent the Secretary, and will supervise, conduct, and argue any civil litigation to which paragraph (c) of this section applies (including any related collection action under paragraph (d) of this section) in a court of the United States or in any other court, except the Supreme Court of the United States. However, the Secretary or the General Counsel will consult with the Attorney General concerning such litigation and the Attorney General will provide, on request, such assistance in the conduct of such litigation as may be appropriate.

(2) In accordance with the provisions of sections 333(d)(5)(B) and 345 of the Act, and subject to the provisions of Section 502(c) of the Department of Energy Organization Act, the Secretary will be represented by the Attorney General, or the Solicitor General, as appropriate, in actions under this section, except to the extent provided in paragraph (e)(1) of this section.

(3) In accordance with the provisions of Section 333(d)(5)(c) and 345 of the Act, Section 402(d) of the Department of Energy Organization Act will not apply with respect to the function of the Secretary under this section.

APPENDIX A TO SUBPART U OF PART 431—SAMPLING PLAN FOR ENFORCEMENT TESTING OF ELECTRIC MOTORS

Step 1. The first sample size (n_1) must be five or more units.

Step 2. Compute the mean ($\bar{X}_1$ of the measured energy performance of the n_1 units in the first sample as follows:

$$\overline{X}_1 = \frac{1}{n_1}\sum_{i=1}^{n_1} X_i \qquad (1)$$

where X_i is the measured full-load efficiency of unit i.

Step 3. Compute the sample standard deviation (S_1) of the measured full-load efficiency of the n_1 units in the first sample as follows:

$$S_1 = \sqrt{\frac{\sum_{i=1}^{n_1}\left(X_i - \overline{X}_1\right)^2}{n_1 - 1}} \qquad (2)$$

Step 4. Compute the standard error ($SE(\bar{X}_1)$) of the mean full-load efficiency of the first sample as follows:

$$SE\left(\overline{X}_1\right) = \frac{S_1}{\sqrt{n_1}} \qquad (3)$$

Step 5. Compute the lower control limit (LCL_1) for the mean of the first sample using RE as the desired mean as follows:

$$LCL_1 = RE - tSE\left(\overline{X}_1\right) \qquad (4)$$

where: RE is the applicable EPCA nominal full-load efficiency when the test is to determine compliance with the applicable statutory standard, or is the labeled nominal full-load efficiency when the test is to determine compliance with the labeled efficiency value, and t is the 2.5th percentile of a t-distribution for a sample size of n_1, which yields a 97.5 percent confidence level for a one-tailed t-test.

Step 6. Compare the mean of the first sample ($\bar{X}_1$) with the lower control limit (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 non-compliance and testing is at an end.

(ii) If the mean is equal to or greater than the lower control limit, no final determination of compliance or non-compliance can be made; proceed to Step 7.

Step 7. Determine the recommended sample size (n) as follows:

$$n = \left[\frac{tS_1(120 - 0.2RE)}{RE\,(20 - 0.2RE)}\right]^2 \qquad (5)$$

where S_1, RE and t have the values used in Steps 3 and 5, respectively. The factor

$$\frac{120 - 0.2RE}{RE\,(20 - 0.2RE)}$$

is based on a 20 percent tolerance in the total power loss at full-load and fixed output power.

Given the value of n, determine one of the following:

(i) If the value of n is less than or equal to n_1 and if the mean energy efficiency of the first sample ($\bar{X}_1$) is equal to or greater than the lower control limit (LCL_1), the basic model is in compliance and testing is at an end.

(ii) If the value of n is greater than n1, the basic model is in non-compliance. The size of a second sample n_2 is determined to be the smallest integer equal to or greater than the difference $n - n_1$. If the value of n_2 so calculated is greater than $20 - n1$, set n_2 equal to $20 - n_1$.

Step 8. Compute the combined ($\bar{X}_2$) mean of the measured energy performance of the n_1

and n_2 units of the combined first and second samples as follows:

$$\bar{X}_2 = \frac{1}{n_1 + n_2} \sum_{i=1}^{n_1+n_2} X_i \qquad (6)$$

Step 9. Compute the standard error ($SE(\bar{X}_2)$) of the mean full-load efficiency of the n_1 and n_2 units in the combined first and second samples as follows:

$$SE(\bar{X}_2) = \frac{S_1}{\sqrt{n_1 + n_2}} \qquad (7)$$

(Note that S_1 is the value obtained above in Step 3.)

Step 10. Set the lower control limit (LCL_2) to,

$$LCL_2 = RE - tSE(\bar{X}_2) \qquad (8)\sqrt{b^2 - 4ac}$$

where t has the value obtained in Step 5, and compare the combined sample mean ($\bar{X}_2$) to the lower control limit (LCL_2) to find one of the following:

(i) If the mean of the combined sample ($\bar{X}_2$) is less than the lower control limit (LCL_2), the basic model is in non-compliance and testing is at an end.

(ii) If the mean of the combined sample ($\bar{X}_2$) is equal to or greater than the lower control limit (LCL_2), the basic model is in compliance and testing is at an end.

MANUFACTURER-OPTION TESTING

If a determination of non-compliance is made in Steps 6, 7 or 10, of this appendix A, the manufacturer may request that additional testing be conducted, in accordance with the following procedures.

Step A. The manufacturer requests that an additional number, n_3, of units be tested, with n_3 chosen such that $n_1 + n_2 + n_3$ does not exceed 20.

Step B. Compute the mean full-load efficiency, standard error, and lower control limit of the new combined sample in accordance with the procedures prescribed in Steps 8, 9, and 10, of this appendix A.

Step C. Compare the mean performance of the new combined sample to the lower control limit (LCL_2) to determine one of the following:

(a) If the new combined sample mean is equal to or greater than the lower control limit, the basic model is in compliance and testing is at an end.

(b) If the new combined sample mean is less than the lower control limit and the value of $n_1 + n_2 + n_3$ is less than 20, the manufacturer may request that additional units be tested. The total of all units tested may not exceed 20. Steps A, B, and C are then repeated.

(c) Otherwise, the basic model is determined to be in non-compliance.

Subpart V—General Provisions

SOURCE: 69 FR 61941, Oct. 21, 2004, unless otherwise noted. Redesignated at 70 FR 60417, Oct. 18, 2005.

§ 431.401 Petitions for waiver, and applications for interim waiver, of test procedure.

(a) *General criteria.* (1) Any interested person may submit a petition to waive for a particular basic model any requirements of §§ 431.16, 431.76, 431.86, 431.96, and 431.106 of this part, upon the grounds that either the basic model contains one or more design characteristics which prevent testing of the basic model according to the prescribed test procedures, or the prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data.

(2) Any person who has submitted a Petition for Waiver as provided in this subpart, may also file an Application for Interim Waiver of the applicable test procedure requirements.

(b) *Submission, content, and publication.* (1) You must submit your Petition for Waiver in triplicate, to the Assistant Secretary for Energy Efficiency and Renewable Energy, U.S. Department of Energy. Each Petition for Waiver must:

(i) Identify the particular basic model(s) for which a waiver is requested, the design characteristic(s) constituting the grounds for the petition, and the specific requirements sought to be waived, and must discuss in detail the need for the requested waiver;

(ii) Identify manufacturers of all other basic models marketed in the United States and known to the petitioner to incorporate similar design characteristic(s);

(iii) Include any alternate test procedures known to the petitioner to evaluate the characteristics of the basic model in a manner representative of its energy consumption; and

(iv) Be signed by you or by an authorized representative. In accordance with the provisions set forth in 10 CFR 1004.11, any request for confidential

treatment of any information contained in a Petition for Waiver or in supporting documentation must be accompanied by a copy of the petition, application or supporting documentation from which the information claimed to be confidential has been deleted. DOE will publish in the FEDERAL REGISTER the petition and supporting documents from which confidential information, as determined by DOE, has been deleted in accordance with 10 CFR 1004.11 and will solicit comments, data and information with respect to the determination of the petition.

(2) You must submit any Application for Interim Waiver in triplicate, with the required three copies of the Petition for Waiver, to the Assistant Secretary for Energy Efficiency and Renewable Energy, U.S. Department of Energy. Each Application for Interim Waiver must reference the Petition for Waiver by identifying the particular basic model(s) for which you seek a waiver and temporary exception. Each Application for Interim Waiver must demonstrate likely success of the Petition for Waiver and address what economic hardship and/or competitive disadvantage is likely to result absent a favorable determination on the Application for Interim Waiver. You or an authorized representative must sign the Application for Interim Waiver.

(c) *Notification to other manufacturers.* (1) After filing a Petition for Waiver with DOE, and after DOE has published the Petition for Waiver in the FEDERAL REGISTER, you must, within five working days of such publication, notify in writing all known manufacturers of domestically marketed units of the same product type (as defined in Section 340(1) of the Act) and must include in the notice a statement that DOE has published in the FEDERAL REGISTER on a certain date the Petition for Waiver and supporting documents from which confidential information, if any, as determined by DOE, has been deleted in accordance with 10 CFR 1004.11. In complying with the requirements of this paragraph, you must file with DOE a statement certifying the names and addresses of each person to whom you have sent a notice of the Petition for Waiver.

(2) If you apply for Interim Waiver, whether filing jointly with or subsequent to your Petition for Waiver with DOE, you must concurrently notify in writing all known manufacturers of domestically marketed units of the same product type (as defined in Section 340(1) of the Act), and must include in the notice a copy of the Petition for Waiver and a copy of the Application for Interim Waiver. In complying with this section, you must in the written notification include a statement that the Assistant Secretary for Energy Efficiency and Renewable Energy will receive and consider timely written comments on the Application for Interim Waiver. Upon filing an Application for Interim Waiver, you must in complying with the requirements of this paragraph certify to DOE that a copy of these documents has been sent to all known manufacturers of domestically marked units of the same product type (as listed in Section 340(1) of the Act). Such certification must include the names and addresses of such persons. You must comply with the provisions of paragraph (c)(1) of this Section with respect to the petition for waiver.

(d) *Comments; responses to comments.* (1) Any person submitting written comments to DOE with respect to an Application for Interim Waiver must also send a copy of the comments to the applicant.

(2) Any person submitting written comments to DOE with the respect to a Petition for Waiver must also send a copy of such comments to the petitioner. In accordance with paragraph (b)(1) of this section, a petitioner may submit a rebuttal statement to the Assistant Secretary for Energy Efficiency and Renewable Energy.

(e) *Provisions specific to interim waivers*—(1) *Disposition of application.* If administratively feasible, DOE will notify the applicant in writing of the disposition of the Application for Interim Waiver within 15 business days of receipt of the application. Notice of DOE's determination on the Application for Interim Waiver will be published in the FEDERAL REGISTER.

(2) *Consequences of filing application.* The filing of an Application for Interim Waiver will not constitute grounds for noncompliance with any requirements

of this subpart, until an Interim Waiver has been granted.

(3) *Criteria for granting.* The Assistant Secretary for Energy Efficiency and Renewable Energy will grant an Interim Waiver from test procedure requirements if he or she determines that the applicant will experience economic hardship if the Application for Interim Waiver is denied, if it appears likely that the Petition for Waiver will be granted, and/or if the Assistant Secretary determines that it would be desirable for public policy reasons to grant immediate relief pending a determination on the Petition for Waiver.

(4) *Duration.* An interim waiver will terminate 180 days after issuance or upon the determination on the Petition for Waiver, whichever occurs first. DOE may extend an interim waiver for up to 180 days or modify its terms based on relevant information contained in the record and any comments received subsequent to issuance of the interim waiver. DOE will publish in the FEDERAL REGISTER notice of such extension and/or any modification of the terms or duration of the interim waiver.

(f) *Provisions specific to waivers*—(1) *Rebuttal by petitioner.* Following publication of the Petition for Waiver in the FEDERAL REGISTER, a petitioner may, within 10 working days of receipt of a copy of any comments submitted in accordance with paragraph (b)(1) of this section, submit a rebuttal statement to the Assistant Secretary for Energy Efficiency and Renewable Energy. A petitioner may rebut more than one response in a single rebuttal statement.

(2) *Disposition of petition.* DOE will notify the petitioner in writing as soon as practicable of the disposition of each Petition for Waiver. The Assistant Secretary for Energy Efficiency and Renewable Energy will issue a decision on the petition as soon as is practicable following receipt and review of the Petition for Waiver and other applicable documents, including, but not limited to, comments and rebuttal statements.

(3) *Consequence of filing petition.* The filing of a Petition for Waiver will not constitute grounds for noncompliance with any requirements of this subpart, until a waiver or interim waiver has been granted.

(4) *Granting: criteria, conditions, and publication.* The Assistant Secretary for Energy Efficiency and Renewable Energy will grant a waiver if he or she determines that either the basic model for which the waiver was requested contains a design characteristic which prevents testing of the basic model according to the prescribed test procedures, or the prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data. The Assistant Secretary for Energy Efficiency and Renewable Energy may grant a waiver subject to conditions, which may include adherence to alternate test procedures. DOE will promptly publish in the FEDERAL REGISTER notice of each waiver granted or denied, and any limiting conditions of each waiver granted.

(g) *Revision of regulation.* Within one year of the granting of any waiver, the Department will publish in the FEDERAL REGISTER a notice of proposed rulemaking to amend our regulations so as to eliminate any need for the continuation of such waiver. As soon thereafter as practicable, the Department will publish in the FEDERAL REGISTER a final rule. Such waiver will terminate on the effective date of such final rule.

(h) *Exhaustion of remedies.* In order to exhaust administrative remedies, any person aggrieved by an action under this Section must file an appeal with the DOE's Office of Hearings and Appeals as provided in 10 CFR Part 1003, subpart C.

§ 431.402 Preemption of State regulations for commercial HVAC & WH products.

Beginning on the effective date of such standard, an energy conservation standard set forth in this part for a commercial HVAC & WH product supersedes any State or local regulation concerning the energy efficiency or energy use of that product, except as provided for in Section 345(b)(2)(B)–(D) of the Act.

§ 431.403 Maintenance of records.

(a) If you are the manufacturer of any covered equipment, you must establish, maintain and retain records of the following:

(1) The test data for all testing conducted pursuant to this part;

(2) For electric motors, the development, substantiation, application, and subsequent verification of any AEDM used under this part;

(3) For electric motors, any written certification received from a certification program, including a certificate or conformity, relied on under the provisions of this part;

(4) For commercial HVAC and WH products, the test data for all testing conducted pursuant to 10 CFR part 431, including any testing conducted by a VICP; and

(5) For commercial HVAC and WH products, the development, substantiation, application, and subsequent verification of any AEDM.

(b) You must organize such records and index them so that they are readily accessible for review. The records must include the supporting test data associated with tests performed on any test units to satisfy the requirements of this part (except tests performed by us directly).

(c) For each basic model, you must retain all such records for a period of two years from the date that production of all units of that basic model has ceased. You must retain records in a form allowing ready access to DOE, upon request.

[69 FR 61941, Oct. 21, 2004. Redesignated at 70 FR 60417, Oct. 18, 2005, as amended at 75 FR 675, Jan. 5, 2010]

§ 431.404 Imported equipment.

(a) Under sections 331 and 345 of the Act, any person importing any covered equipment into the United States must comply with the provisions of the Act and of this part, and is subject to the remedies of this part.

(b) Any covered equipment offered for importation in violation of the Act and of this part will be refused admission into the customs territory of the United States under rules issued by the Secretary of the Treasury, except that the Secretary of the Treasury may, by such rules, authorize the importation of such covered equipment upon such terms and conditions (including the furnishing of a bond) as may appear to the Secretary of Treasury appropriate to ensure that such covered equipment will not violate the Act and this part, or will be exported or abandoned to the United States.

§ 431.405 Exported equipment.

Under Sections 330 and 345 of the Act, this Part does not apply to any covered equipment if:

(a) Such equipment is manufactured, sold, or held for sale for export from the United States (or such equipment was imported for export), unless such equipment is, in fact, distributed in commerce for use in the United States; and,

(b) Such equipment, when distributed in commerce, or any container in which it is enclosed when so distributed, bears a stamp or label stating that such covered equipment is intended for export.

§ 431.406 Subpoena.

Pursuant to sections 329(a) and 345 of the Act, for purposes of carrying out this part, the Secretary or the Secretary's designee, 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 the 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 this part, the Secretary 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 a contempt thereof.

§ 431.407 Confidentiality.

Pursuant to the provisions of 10 CFR 1004.11, any person submitting information or data which the person believes to be confidential and exempt from

public disclosure should submit one complete copy, and 15 copies from which the information believed to be confidential has been deleted. In accordance with the procedures established at 10 CFR 1004.11, the Department shall make its own determination with regard to any claim that information submitted be exempt from public disclosure.

§ 431.408 Preemption of State regulations for covered equipment other than electric motors and commercial heating, ventilating, air-conditioning and water heating products.

This section concerns State regulations providing for any energy conservation standard, or water conservation standard (in the case of commercial prerinse spray valves or commercial clothes washers), or other requirement with respect to the energy efficiency, energy use, or water use (in the case of commercial prerinse spray valves or commercial clothes washers), for any covered equipment other than an electric motor or commercial HVAC and WH product. Any such regulation that contains a standard or requirement that is not identical to a Federal standard in effect under this subpart is preempted by that standard, except as provided for in sections 327(b) and (c) and 345(e), (f) and (g) of the Act.

[75 FR 675, Jan. 5, 2010]

Subpart W—Petitions To Exempt State Regulation From Preemption; Petitions To Withdraw Exemption of State Regulation

SOURCE: 69 FR 61941, Oct. 21, 2004, unless otherwise noted. Redesignated at 70 FR 60417, Oct. 18, 2005.

§ 431.421 Purpose and scope.

(a) The regulations in this subpart prescribe the procedures to be followed in connection with petitions requesting a rule that a State regulation prescribing an energy conservation standard or other requirement respecting energy use or energy efficiency of a type (or class) of covered equipment not be preempted.

(b) The regulations in this subpart also prescribe the procedures to be followed in connection with petitions to withdraw a rule exempting a State regulation prescribing an energy conservation standard or other requirement respecting energy use or energy efficiency of a type (or class) of covered equipment.

§ 431.422 Prescriptions of a rule.

(a) *Criteria for exemption from preemption.* Upon petition by a State which has prescribed an energy conservation standard or other requirement for a type or class of covered equipment for which a Federal energy conservation standard is applicable, the Secretary shall prescribe a rule that such standard not be preempted if he/she determines that the State has established by a preponderance of evidence that such requirement is needed to meet unusual and compelling State or local energy interests. For the purposes of this regulation, the term "unusual and compelling State or local energy interests" means interests which are substantially different in nature or magnitude from those prevailing in the U.S. generally, and are such that when evaluated within the context of the State's energy plan and forecast, the costs, benefits, burdens, and reliability of energy savings resulting from the State regulation make such regulation preferable or necessary when measured against the costs, benefits, burdens, and reliability of alternative approaches to energy savings or production, including reliance on reasonably predictable market-induced improvements in efficiency of all equipment subject to the State regulation. The Secretary may not prescribe such a rule if he finds that interested persons have established, by a preponderance of the evidence, that the State's regulation will significantly burden manufacturing, marketing, distribution, sale or servicing of the covered equipment on a national basis. In determining whether to make such a finding, the Secretary shall evaluate all relevant factors including: The extent to which the State regulation will increase manufacturing or distribution costs of manufacturers, distributors, and others;

the extent to which the State regulation will disadvantage smaller manufacturers, distributors, or dealers or lessen competition in the sale of the covered equipment in the State; the extent to which the State regulation would cause a burden to manufacturers to redesign and produce the covered equipment type (or class), taking into consideration the extent to which the regulation would result in a reduction in the current models, or in the projected availability of models, that could be shipped on the effective date of the regulation to the State and within the U.S., or in the current or projected sales volume of the covered equipment type (or class) in the State and the U.S.; and the extent to which the State regulation is likely to contribute significantly to a proliferation of State commercial and industrial equipment efficiency requirements and the cumulative impact such requirements would have. The Secretary may not prescribe such a rule if he/she finds that such a rule will result in the unavailability in the State of any covered equipment (or class) of performance characteristics (including reliability), features, sizes, capacities, and volumes that are substantially the same as those generally available in the State at the time of the Secretary's finding. The failure of some classes (or types) to meet this criterion shall not affect the Secretary's determination of whether to prescribe a rule for other classes (or types).

(1) Requirements of petition for exemption from preemption. A petition from a State for a rule for exemption from preemption shall include the information listed in paragraphs (a)(1)(i) through (a)(1)(vi) of this section. A petition for a rule and correspondence relating to such petition shall be available for public review except for confidential or proprietary information submitted in accordance with the Department of Energy's Freedom of Information Regulations set forth in 10 CFR Part 1004.

(i) The name, address, and telephone number of the petitioner;

(ii) A copy of the State standard for which a rule exempting such standard is sought;

(iii) A copy of the State's energy plan and forecast;

(iv) Specification of each type or class of covered equipment for which a rule exempting a standard is sought;

(v) Other information, if any, believed to be pertinent by the petitioner; and

(vi) Such other information as the Secretary may require.

(b) *Criteria for exemption from preemption when energy emergency conditions exist within State.* Upon petition by a State which has prescribed an energy conservation standard or other requirement for a type or class of covered equipment for which a Federal energy conservation standard is applicable, the Secretary may prescribe a rule, effective upon publication in the FEDERAL REGISTER, that such regulation not be preempted if he determines that in addition to meeting the requirements of paragraph (a) of this Section the State has established that: an energy emergency condition exists within the State that imperils the health, safety, and welfare of its residents because of the inability of the State or utilities within the State to provide adequate quantities of gas or electric energy to its residents at less than prohibitive costs; and cannot be substantially alleviated by the importation of energy or the use of interconnection agreements; and the State regulation is necessary to alleviate substantially such condition.

(1) Requirements of petition for exemption from preemption when energy emergency conditions exist within a State. A petition from a State for a rule for exemption from preemption when energy emergency conditions exist within a State shall include the information listed in paragraphs (a)(1)(i) through (a)(1)(vi) of this section. A petition shall also include the information prescribed in paragraphs (b)(1)(i) through (b)(1)(iv) of this section, and shall be available for public review except for confidential or proprietary information submitted in accordance with the Department of Energy's Freedom of Information Regulations set forth in 10 CFR Part 1004:

(i) A description of the energy emergency condition which exists within

the State, including causes and impacts.

(ii) A description of emergency response actions taken by the State and utilities within the State to alleviate the emergency condition;

(iii) An analysis of why the emergency condition cannot be alleviated substantially by importation of energy or the use of interconnection agreements;

(iv) An analysis of how the State standard can alleviate substantially such emergency condition.

(c) *Criteria for withdrawal of a rule exempting a State standard.* Any person subject to a State standard which, by rule, has been exempted from Federal preemption and which prescribes an energy conservation standard or other requirement for a type or class of covered equipment, when the Federal energy conservation standard for such equipment subsequently is amended, may petition the Secretary requesting that the exemption rule be withdrawn. The Secretary shall consider such petition in accordance with the requirements of paragraph (a) of this section, except that the burden shall be on the petitioner to demonstrate that the exemption rule received by the State should be withdrawn as a result of the amendment to the Federal standard. The Secretary shall withdraw such rule if he determines that the petitioner has shown the rule should be withdrawn.

(1) Requirements of petition to withdraw a rule exempting a State standard. A petition for a rule to withdraw a rule exempting a State standard shall include the information prescribed in paragraphs (c)(1)(i) through (c)(1)(vii) of this section, and shall be available for public review, except for confidential or proprietary information submitted in accordance with the Department of Energy's Freedom of Information Regulations set forth in 10 CFR Part 1004:

(i) The name, address and telephone number of the petitioner;

(ii) A statement of the interest of the petitioner for which a rule withdrawing an exemption is sought;

(iii) A copy of the State standard for which a rule withdrawing an exemption is sought;

(iv) Specification of each type or class of covered equipment for which a rule withdrawing an exemption is sought;

(v) A discussion of the factors contained in paragraph (a) of this section;

(vi) Such other information, if any, believed to be pertinent by the petitioner; and

(vii) Such other information as the Secretary may require.

(2) [Reserved]

§ 431.423 Filing requirements.

(a) *Service.* All documents required to be served under this subpart shall, if mailed, be served by first class mail. Service upon a person's duly authorized representative shall constitute service upon that person.

(b) *Obligation to supply information.* A person or State submitting a petition is under a continuing obligation to provide any new or newly discovered information relevant to that petition. Such information includes, but is not limited to, information regarding any other petition or request for action subsequently submitted by that person or State.

(c) *The same or related matters.* A person or State submitting a petition or other request for action shall state whether to the best knowledge of that petitioner the same or related issue, act, or transaction has been or presently is being considered or investigated by any State agency, department, or instrumentality.

(d) *Computation of time.* (1) Computing any period of time prescribed by or allowed under this subpart, the day of the action from which the designated period of time begins to run is not to be included. If the last day of the period is Saturday, or Sunday, or Federal legal holiday, the period runs until the end of the next day that is neither a Saturday, or Sunday or Federal legal holiday.

(2) Saturdays, Sundays, and intervening Federal legal holidays shall be excluded from the computation of time when the period of time allowed or prescribed is 7 days or less.

(3) When a submission is required to be made within a prescribed time, DOE may grant an extension of time upon good cause shown.

(4) Documents received after regular business hours are deemed to have been submitted on the next regular business day. Regular business hours for the DOE's National Office, Washington, DC, are 8:30 a.m. to 4:30 p.m.

(5) DOE reserves the right to refuse to accept, and not to consider, untimely submissions.

(e) *Filing of petitions.* (1) A petition for a rule shall be submitted in triplicate to: The Assistant Secretary for Energy Efficiency and Renewable Energy, U.S. Department of Energy, Section 327 Petitions, Building Technologies, EE–2J, Forrestal Building,1000 Independence Avenue, SW., Washington, DC 20585.

(2) A petition may be submitted on behalf of more than one person. A joint petition shall indicate each person participating in the submission. A joint petition shall provide the information required by § 431.212 for each person on whose behalf the petition is submitted.

(3) All petitions shall be signed by the person(s) submitting the petition or by a duly authorized representative. If submitted by a duly authorized representative, the petition shall certify this authorization.

(4) A petition for a rule to withdraw a rule exempting a State regulation, all supporting documents, and all future submissions shall be served on each State agency, department, or instrumentality whose regulation the petitioner seeks to supersede. The petition shall contain a certification of this service which states the name and mailing address of the served parties, and the date of service.

(f) *Acceptance for filing.* (1) Within 15 days of the receipt of a petition, the Secretary will either accept it for filing or reject it, and the petitioner will be so notified in writing. The Secretary will serve a copy of this notification on each other party served by the petitioner. Only such petitions which conform to the requirements of this subpart and which contain sufficient information for the purposes of a substantive decision will be accepted for filing. Petitions which do not so conform will be rejected and an explanation provided to petitioner in writing.

(2) For purposes of the Act and this subpart, a petition is deemed to be filed on the date it is accepted for filing.

(g) *Docket.* A petition accepted for filing will be assigned an appropriate docket designation. Petitioner shall use the docket designation in all subsequent submissions.

§ 431.424 Notice of petition.

(a) Promptly after receipt of a petition and its acceptance for filing, notice of such petition shall be published in the FEDERAL REGISTER. The notice shall set forth the availability for public review of all data and information available, and shall solicit comments, data and information with respect to the determination on the petition. Except as may otherwise be specified, the period for public comment shall be 60 days after the notice appears in the FEDERAL REGISTER.

(b) In addition to the material required under paragraph (a) of this section, each notice shall contain a summary of the State regulation at issue and the petitioner's reasons for the rule sought.

§ 431.425 Consolidation.

DOE may consolidate any or all matters at issue in two or more proceedings docketed where there exist common parties, common questions of fact and law, and where such consolidation would expedite or simplify consideration of the issues. Consolidation shall not affect the right of any party to raise issues that could have been raised if consolidation had not occurred.

§ 431.426 Hearing.

The Secretary may hold a public hearing, and publish notice in the FEDERAL REGISTER of the date and location of the hearing, when he determines that such a hearing is necessary and likely to result in a timely and effective resolution of the issues. A transcript shall be kept of any such hearing.

§ 431.427 Disposition of petitions.

(a) After the submission of public comments under § 431.213(a), the Secretary shall prescribe a final rule or

deny the petition within 6 months after the date the petition is filed.

(b) The final rule issued by the Secretary or a determination by the Secretary to deny the petition shall include a written statement setting forth his findings and conclusions, and the reasons and basis therefor. A copy of the Secretary's decision shall be sent to the petitioner and the affected State agency. The Secretary shall publish in the FEDERAL REGISTER a notice of the final rule granting or denying the petition and the reasons and basis therefor.

(c) If the Secretary finds that he cannot issue a final rule within the 6-month period pursuant to paragraph (a) of this section, he shall publish a notice in the FEDERAL REGISTER extending such period to a date certain, but no longer than one year after the date on which the petition was filed. Such notice shall include the reasons for the delay.

§ 431.428 Effective dates of final rules.

(a) A final rule exempting a State standard from Federal preemption will be effective:

(1) Upon publication in the FEDERAL REGISTER if the Secretary determines that such rule is needed to meet an "energy emergency condition" within the State;

(2) Three years after such rule is published in the FEDERAL REGISTER; or

(3) Five years after such rule is published in the FEDERAL REGISTER if the Secretary determines that such additional time is necessary due to the burdens of retooling, redesign or distribution.

(b) A final rule withdrawing a rule exempting a State standard will be effective upon publication in the FEDERAL REGISTER.

§ 431.429 Request for reconsideration.

(a) Any petitioner whose petition for a rule has been denied may request reconsideration within 30 days of denial. The request shall contain a statement of facts and reasons supporting reconsideration and shall be submitted in writing to the Secretary.

(b) The denial of a petition will be reconsidered only where it is alleged and demonstrated that the denial was based on error in law or fact and that evidence of the error is found in the record of the proceedings.

(c) If the Secretary fails to take action on the request for reconsideration within 30 days, the request is deemed denied, and the petitioner may seek such judicial review as may be appropriate and available.

(d) A petitioner has not exhausted other administrative remedies until a request for reconsideration has been filed and acted upon or deemed denied.

§ 431.430 Finality of decision.

(a) A decision to prescribe a rule that a State energy conservation standard or other requirement not be preempted is final on the date the rule is issued, *i.e.*, signed by the Secretary. A decision to prescribe such a rule has no effect on other regulations of covered equipment of any other State.

(b) A decision to prescribe a rule withdrawing a rule exempting a State standard or other requirement is final on the date the rule is issued, *i.e.*, signed by the Secretary. A decision to deny such a petition is final on the day a denial of a request for reconsideration is issued, *i.e.*, signed by the Secretary.

Subpart X—Small Electric Motors

SOURCE: 74 FR 32072, July 7, 2009, unless otherwise noted.

§ 431.441 Purpose and scope.

This subpart contains definitions, test procedures, and energy conservation requirements for small electric motors, pursuant to Part A–1 of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6311–6317.

§ 431.442 Definitions.

The following definitions are applicable to this subpart:

Alternative efficiency determination method, or AEDM, means, with respect to a small electric motor, a method of calculating the total power loss and average full-load efficiency.

Average full-load efficiency means the arithmetic mean of the full-load efficiencies of a population of small electric motors of duplicate design, where the full-load efficiency of each motor

in the population is the ratio (expressed as a percentage) of the motor's useful power output to its total power input when the motor is operated at its full rated load, rated voltage, and rated frequency.

Basic model means, with respect to a small electric motor, all units of a given type of small electric motor (or class thereof) manufactured by a single manufacturer, and which have the same rating, have electrical characteristics that are essentially identical, and do not have any differing physical or functional characteristics that affect energy consumption or efficiency. For the purpose of this definition, "rating" means a combination of the small electric motor's group (i.e., capacitor-start, capacitor-run; capacitor-start, induction-run; or polyphase), horsepower rating (or standard kilowatt equivalent), and number of poles with respect to which § 431.446 prescribes nominal full load efficiency standards.

CAN/CSA means Canadian Standards Association.

DOE or *the Department* means the U.S. Department of Energy.

EPCA means the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6291–6317.

IEC means International Electrotechnical Commission.

IEEE means Institute of Electrical and Electronics Engineers, Inc.

NEMA means National Electrical Manufacturers Association.

Small electric motor means a NEMA general purpose alternating current single-speed induction motor, built in a two-digit frame number series in accordance with NEMA Standards Publication MG1–1987, including IEC metric equivalent motors.

TEST PROCEDURES

§ 431.443 Materials incorporated by reference.

(a) *General.* The Department incorporates by reference the following standards into Subpart X of part 431. The Director of the Federal Register has approved the material listed in paragraph (b) of this section for incorporation by reference in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Any subsequent amendment to a standard by the standard-setting organization will not affect the DOE test procedures unless and until the DOE amends its test procedures. DOE incorporates the material as it exists on the date of the approval and a notice of any change in the material will be published in the FEDERAL REGISTER. All approved material is available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: *http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.* Also, this material is available for inspection 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) 586–2945, or go to *http://www1.eere.energy.gov/buildings/appliance_standards/.* Standards can be obtained from the sources below.

(b) *CAN/CSA.* Canadian Standards Association, Sales Department, 5060 Spectrum Way, Suite 100, Mississauga, Ontario, L4W 5N6, Canada, 1–800–463–6727, or go to *http://www.shopcsa.ca/onlinestore/welcome.asp.*

(1) CAN/CSA–C747–94 ("CAN/CSA–C747") (Reaffirmed 2005), *Energy Efficiency Test Methods for Single- and Three-Phase Small Motors,* IBR approved for § 431.444.

(2) [Reserved]

(c) *IEEE.* Institute of Electrical and Electronics Engineers, Inc., 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855–1331, 1–800–678–IEEE (4333), or go to *http://www.ieee.org/web/publications/home/index.html.*

(1) IEEE Std 112™–2004 (Revision of IEEE Std 112–1996) ("IEEE Std 112"), *IEEE Standard Test Procedure for Polyphase Induction Motors and Generators,* approved February 9, 2004, IBR approved for § 431.444.

(2) IEEE Std 114–2001™ (Revision of IEEE Std 114–1982) ("IEEE Std 114"), *IEEE Standard Test Procedure for Single-Phase Induction Motors,* approved December 6, 2001, IBR approved for § 431.444.

§ 431.444 Test procedures for the measurement of energy efficiency.

(a) *Scope.* Pursuant to section 346(b)(1) of EPCA, this section provides the test procedures for measuring, pursuant to EPCA, the efficiency of small electric motors pursuant to EPCA. (42 U.S.C. 6317(b)(1)) For purposes of this Part 431 and EPCA, the test procedures for measuring the efficiency of small electric motors shall be the test procedures specified in § 431.444(b).

(b) *Testing and Calculations.* Determine the energy efficiency and losses by using one of the following test methods:

(1) Single-phase small electric motors: either IEEE Std 114, (incorporated by reference, see § 431.443), or CAN/CSA C747, (incorporated by reference, see § 431.443);

(2) Polyphase small electric motors less than or equal to 1 horsepower (0.746 kW): IEEE Std 112 (incorporated by reference, see § 431.443), Test Method A; or

(3) Polyphase small electric motors greater than 1 horsepower (0.746 kW): IEEE Std 112 (incorporated by reference, *see* § 431.443), Test Method B.

§ 431.445 Determination of small electric motor efficiency.

(a) *Scope.* When a party determines the energy efficiency of a small electric motor to comply with an obligation imposed on it by or pursuant to Part A–1 of Title III of EPCA, 42 U.S.C. 6311–6317, this section applies.

(b) *Provisions applicable to all small electric motors*—(1) *General requirements.* The average full-load efficiency of each basic model of small electric motor must be determined either by testing in accordance with § 431.444 of this subpart, or by application of an alternative efficiency determination method (AEDM) that meets the requirements of paragraphs (a)(2) and (3) of this section, provided, however, that an AEDM may be used to determine the average full-load efficiency of one or more of a manufacturer's basic models only if the average full-load efficiency of at least five of its other basic models is determined through testing.

(2) *Alternative efficiency determination method.* An AEDM applied to a basic model must be:

(i) Derived from a mathematical model that represents the mechanical and electrical characteristics of that basic model, and

(ii) Based on engineering or statistical analysis, computer simulation or modeling, or other analytic evaluation of performance data.

(3) *Substantiation of an alternative efficiency determination method.* Before an AEDM is used, its accuracy and reliability must be substantiated as follows:

(i) The AEDM must be applied to at least five basic models that have been tested in accordance with § 431.444; and

(ii) The predicted total power loss for each such basic model, calculated by applying the AEDM, must be within plus or minus 10 percent of the mean total power loss determined from the testing of that basic model.

(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 the method or methods used; 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; complete test data, product information, and related information that the manufacturer has generated or acquired pursuant to paragraph (a)(3) of this section; and 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 shall conduct simulations to predict the performance of particular basic models of small electric motors specified by the Department, analyses of previous simulations conducted by the manufacturer, sample testing of basic models selected by the Department, or a combination of the foregoing.

(c) *Additional testing requirements*—(1) *Selection of basic models for testing if an AEDM is to be applied.*

(i) A manufacturer must select basic models for testing in accordance with the criteria that follow:

(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-month period before the effective date of the energy efficiency standard, whichever is later, and in identifying these five basic models, any small electric motor that does not comply with § 431.446 shall be excluded from consideration;

(B) The basic models should be of different horsepower ratings without duplication;

(C) At least one basic model should be selected from each of the frame number series for the designs of small electric motors for which the AEDM is to be used; and

(D) Each basic model should have the lowest nominal full-load efficiency among the basic models with the same rating ("rating" as used here has the same meaning as it has in the definition of "basic model").

(ii) If 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.

(2) [Reserved]

ENERGY CONSERVATION STANDARDS

§ 431.446 Small electric motors energy conservation standards and their effective dates.

(a) Each small electric motor manufactured (alone or as a component of another piece of non-covered equipment) after March 9, 2015, or in the case of a small electric motor which requires listing or certification by a nationally recognized safety testing laboratory, after March 9, 2017, shall have an average full load efficiency of not less than the following:

Motor horsepower/standard kilowatt equivalent	Average full load efficiency		
	Polyphase		
	Open motors (number of poles)		
	6	4	2
0.25/0.18	67.5	69.5	65.6
0.33/0.25	71.4	73.4	69.5
0.5/0.37	75.3	78.2	73.4
0.75/0.55	81.7	81.1	76.8
1/0.75	82.5	83.5	77.0
1.5/1.1	83.8	86.5	84.0
2/1.5	N/A	86.5	85.5
3/2.2	N/A	86.9	85.5

Motor horsepower/standard kilowatt equivalent	Average full load efficiency		
	Capacitor-start capacitor-run and capacitor-start induction-run		
	Open motors (number of poles)		
	6	4	2
0.25/0.18	62.2	68.5	66.6
0.33/0.25	66.6	72.4	70.5
0.5/0.37	76.2	76.2	72.4
0.75/0.55	80.2	81.8	76.2
1/0.75	81.1	82.6	80.4
1.5/1.1	N/A	83.8	81.5
2/1.5	N/A	84.5	82.9
3/2.2	N/A	N/A	84.1

(b) For purposes of determining the required minimum average full load efficiency of an electric motor that has a horsepower or kilowatt rating between two horsepower or two kilowatt ratings listed in any table of efficiency standards in paragraph (a) of this section, each such motor shall be deemed to have a listed horsepower or kilowatt rating, determined as follows:

(1) A horsepower at or above the midpoint between the two consecutive horsepower ratings shall be rounded up to the higher of the two horsepower ratings;

(2) A horsepower below the midpoint between the two consecutive horsepower ratings shall be rounded down to the lower of the two horsepower ratings; or

(3) A kilowatt rating shall be directly converted from kilowatts to horsepower using the formula 1 kilowatt = (1/0.746) hp, without calculating beyond three significant decimal places, and the resulting horsepower shall be rounded in accordance with paragraphs (b)(1) or (b)(2) of this section, whichever applies.

[75 FR 10947, Mar. 9, 2010; 75 FR 17036, Apr. 5, 2010]