

(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, 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.


(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.


(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;


(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) 397–7056 (international).


(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.


(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.”

§ 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