

Rules and Regulations

Federal Register

Vol. 76, No. 86

Wednesday, May 4, 2011

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DEPARTMENT OF ENERGY

10 CFR Part 430

[Docket No. EERE-2009-BT-TP-0016]

RIN: 1904-AB99

Energy Conservation Program: Test Procedures for Fluorescent Lamp Ballasts

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Final rule.

SUMMARY: The U.S. Department of Energy (DOE) issues a final rule amending the existing test procedures for fluorescent lamp ballasts at Appendix Q and establishing a new test procedure at Appendix Q1. The amendments to appendix Q update a reference to an industry test procedure. The new test procedure at Appendix Q1 changes the efficiency metric to ballast luminous efficiency (BLE), which is measured directly using electrical measurements instead of the photometric measurements employed in the test procedure at Appendix Q. The calculation of BLE includes a correction factor to account for the reduced lighting efficacy of low frequency lamp operation. The test procedure specifies use of a fluorescent lamp load during testing, allowing ballasts to operate closer to their optimal design points and providing a better descriptor of real ballast performance compared to resistor loads. If DOE determines that amendments to the fluorescent lamp ballast energy conservation standards are required, they will be issued or published by June 30, 2011, and use of the test procedures at Appendix Q1 will be required on the compliance date of the amendments. Until that time, manufacturers must use the procedures at Appendix Q to certify compliance.

DATES: The effective date of the final rule is June 3, 2011. After October 31, 2011, manufacturers may not make any representation regarding fluorescent lamp ballast efficiency unless such ballast has been tested in accordance with the final rule provisions in Appendix Q.

The incorporation by reference of certain standards in this rulemaking is approved by the Director of the Office of the Federal Register as of June 3, 2011.

ADDRESSES: The public may review copies of all materials related to this rulemaking at the U.S. Department of Energy, Resource Room of the Building Technologies Program, 950 L'Enfant Plaza, SW., Suite 600, Washington, DC, (202) 586-2945, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays. Please contact Ms. Brenda Edwards at the above telephone number, or by e-mail at Brenda_Edwards@ee.doe.gov, for additional information regarding visiting the Resource Room.

Docket: The docket is available for review at <http://www.regulations.gov>, including **Federal Register** documents, framework documents, public meeting attendee lists and transcripts, comments, and other supporting documents/materials. All documents in the docket are listed in the [regulations.gov](http://www.regulations.gov) index. However, not all documents listed in the index may be publicly available, such as information that is exempt from public disclosure.

A link to the docket Web page can be found at: http://www.eere.energy.gov/buildings/appliance_standards/residential/fluorescent_lamp_ballasts.html. This Web page will contain a link to the docket for this document on the <http://regulations.gov> site. The regulations.gov Web page will contain simple instructions on how to access all documents, including public comments, in the docket.

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GC-71, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 586-7796. E-mail: elizabeth.kohl@hq.doe.gov.

SUPPLEMENTARY INFORMATION: This final rule incorporates by reference into part 430 the following industry standards: (1) ANSI C78.81-2010, American National Standard for Electric Lamps—Double-Capped Fluorescent Lamps—Dimensional and Electrical Characteristics, approved January 14, 2010; IBR approved for Appendix Q and Appendix Q1 to Subpart B.

(2) ANSI C82.1-2004 (“ANSI C82.1”), American National Standard for Lamp Ballast—Line-Frequency Fluorescent Lamp Ballast, approved November 19, 2004; IBR approved for Appendix Q and Appendix Q1 to Subpart B.

(3) ANSI C82.11 Consolidated-2002 (“ANSI C82.11”), American National Standard for Lamp Ballasts—High-frequency Fluorescent Lamp Ballasts—Supplements, approved March 11, 1999, August 5, 1999 and January 17, 2002; IBR approved for Appendix Q and Appendix Q1 to Subpart B.

(4) ANSI C82.13-2002 (“ANSI C82.13”), American National Standard for Lamp Ballasts—Definitions for Fluorescent Lamps and Ballasts, approved July 23, 2002; IBR approved for Appendix Q and Appendix Q1 to Subpart B.

These standards are available at <http://webstore.ansi.org/>. You can also view copies of these standards at the U.S. Department of Energy, Resource Room of the Building Technologies Program, 950 L'Enfant Plaza, SW., 6th Floor, Washington, DC 20024, (202) 586-2945, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays.

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I. Authority and Background

Title III of the Energy Policy and Conservation Act (42 U.S.C. 6291, *et seq.*; “EPCA” or, “the Act”) sets forth a variety of provisions designed to improve energy efficiency. (All references to EPCA refer to the statute as amended through the Energy Independence and Security Act of 2007 (EISA 2007), Pub. L. 110–140 (Dec. 19, 2007)). Part B of title III (42 U.S.C. 6291–6309), which was re-designated as Part A on codification in the U.S. Code for editorial reasons, establishes the “Energy Conservation Program for Consumer Products Other Than Automobiles.” These include fluorescent lamp ballasts, the subject of today’s notice. (42 U.S.C. 6291(1), (2) and 6292(a)(13))

Under EPCA, this program consists essentially of three parts: (1) Testing, (2) labeling, (3) Federal energy conservation standards, and (4) certification and enforcement procedures. The testing requirements consist of test procedures that manufacturers of covered products must use (1) as the basis for certifying to DOE that their products comply with the applicable energy conservation standards adopted under EPCA, and (2) for making representations about the efficiency of those products. Similarly, DOE must use these test requirements to determine whether the products comply with any relevant standards promulgated under EPCA.

The Energy Independence and Security Act of 2007 also amended EPCA to require DOE to review test procedures for all covered products at least once every seven years. DOE must either amend the test procedures or publish notice in the **Federal Register** of

any determination not to amend a test procedure. (42 U.S.C. 6293(b)(1)(A)) To fulfill this periodic review requirement, DOE invited comment on all aspects of the existing test procedures for fluorescent lamp ballasts that appear at Title 10 of the CFR part 430, Subpart B, Appendix Q (“Uniform Test Method for Measuring the Energy Consumption of Fluorescent Lamp Ballasts”).

In a separate rulemaking proceeding, DOE is considering amending energy conservation standards for fluorescent lamp ballasts (docket number EERE–2007–BT–STD–0016; hereinafter referred to as the “standards rulemaking”). DOE initiated that rulemaking by publishing a **Federal Register** (FR) notice announcing a public meeting and availability of the framework document (“Energy Efficiency Program for Consumer Products: Public Meeting and Availability of the Framework Document for Fluorescent Lamp Ballasts”) on January 22, 2008. 73 FR 3653. On February 6, 2008, DOE held a public meeting in Washington, DC to discuss the framework document for the standards rulemaking (hereinafter referred to as the “2008 public meeting”). At that meeting, attendees also discussed potential revisions to the test procedure for active mode energy consumption relevant to this test procedure rulemaking. On March 24, 2010, DOE published a notice of public meeting and availability of the preliminary technical support document (TSD) for the standards rulemaking. 75 FR 14319. On April 26, 2010, DOE held a public meeting to discuss the standards preliminary analysis and the proposed test procedure discussed below. On April 11, 2011, DOE published a notice of public rulemaking (NOPR) for the fluorescent lamp ballast standards rulemaking. 76 FR 20090.

For the test procedure, DOE published a NOPR on March 24, 2010. 75 FR 14288. As indicated above, on April 26, 2010, DOE held a public meeting to discuss the test procedure proposals in the NOPR and the preliminary TSD for the standards rulemaking (hereafter “NOPR public meeting”). DOE modified the test procedure based on the comments it received on the NOPR. On November 24, 2010, DOE published a test procedure supplemental notice of proposed rulemaking (SNOPR). 75 FR 71570. All comments on the fluorescent lamp ballast test procedure SNOPR are discussed in section III of this rulemaking.

As discussed in the SNOPR, DOE has also established a standby mode and off mode test procedure. The Energy Independence and Security Act of 2007

(Pub. L. 110–140) amended EPCA to require that, for each covered product for which DOE’s current test procedures do not fully account for standby mode and off mode energy consumption, DOE amend the test procedures to include standby mode and off mode energy consumption into the overall energy efficiency, energy consumption, or other energy descriptor for that product. If an integrated test procedure is technically infeasible, DOE must prescribe a separate standby mode and off mode energy use test procedure, if technically feasible. (42 U.S.C. 6295(gg)(2)(A)) DOE published a final rule addressing standby mode and off mode energy consumption for fluorescent lamp ballasts in the **Federal Register** on October 22, 2009. 74 FR 54445. This final rulemaking does not include any changes to the measurement of standby and off mode energy consumption for fluorescent lamp ballasts.

General Test Procedure Rulemaking Process

Under 42 U.S.C. 6293, EPCA sets forth the criteria and procedures DOE must follow when prescribing or amending test procedures for covered products. EPCA requires that any test procedures prescribed or amended under this section be reasonably designed to produce test results that measure energy efficiency, energy use or estimated annual operating cost of a covered product during a representative average use cycle or period of use, as determined by the Secretary of Energy. Test procedures must also not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3))

In addition, if DOE determines that a test procedure amendment is warranted, it must publish proposed test procedures and offer the public an opportunity to present oral and written comments on them. (42 U.S.C. 6293(b)(2)) Finally, in any rulemaking to amend a test procedure, DOE must determine whether the proposed test procedure would alter the measured energy efficiency of any covered product as determined under the existing test procedure. (42 U.S.C. 6293(e)(1)) If DOE determines that the amended test procedure would alter the measured efficiency of a covered product, DOE must amend the applicable energy conservation standard accordingly. (42 U.S.C. 6293(e)(2)).

In today’s final rule, DOE institutes a new test procedure that measures a different metric than the test procedure at Appendix Q. The new metric is the BLE metric described in section III.B.1. The new test procedure will be used only with any standards developed or

revised using data collected with the new test procedure.

II. Summary of the Final Rule

In this test procedure final rule, DOE amends the current procedures for fluorescent lamp ballasts to reduce measurement variation and testing burden. These changes eliminate photometric measurements and prescribe the use of electrical measurements of a lamp-and-ballast system. In addition, this test procedure measures a new metric, ballast luminous efficiency (BLE), which more directly assesses the electrical losses in a ballast compared to the existing ballast efficacy factor (BEF) metric. DOE also establishes a minor update to the existing test procedure in appendix Q. The following paragraphs summarize these changes.

In the SNOPR, DOE proposed to measure ballast input power and lamp arc power using only electrical measurements of a lamp-and-ballast system. Variation in the measured power of a reference lamp was minimized by the calculation of ballast luminous efficiency, where BLE was equal to total lamp arc power divided by ballast input power. This proposal remains unchanged in this final rule. To account for the increase in lamp efficacy associated with high-frequency lamp operation versus low-frequency, DOE also proposed an adjustment to the BLE of low-frequency systems. DOE proposed that low-frequency BLE be multiplied by 0.9 to account for the approximately 10% increase in lighting efficacy associated with high-frequency lamp operation. For the final rule, DOE assigns specific lamp operating frequency adjustment factors for each ballast type considered. The adjustment factors more accurately approximate the increase in lighting efficacy associated with high-frequency lamp operation. In the SNOPR, DOE also proposed a method for calculating the ballast factor (BF) of a ballast by dividing the measured lamp arc power on the test ballast by the measured lamp arc power on a reference ballast. In cases where reference ballast operating conditions were unavailable, the SNOPR provided a reference lamp power (specific to the ballast type) from ANSI standard C78.81–2010 or from empirical results. In this final rule, DOE is not defining a BF measurement process because the standards NOPR does not use BF to define product classes.

The final test procedure includes specific provisions for the testing of ballasts identified in the proposed scope of coverage for the standards NOPR. If the scope of coverage changes in later

stages of the standards rulemaking, DOE will by rule add or remove provisions from the test procedure so that it is consistent with the final scope of coverage. See section III.G for further detail.

In any rulemaking to amend a test procedure, DOE must determine whether the proposed test procedure would alter the measured energy efficiency of any covered product as determined under the existing test procedure. (42 U.S.C. 6293(e)(1)) If DOE determines that the amended test procedure would alter the measured efficiency of a covered product, DOE must amend the applicable energy conservation standard accordingly. (42 U.S.C. 6293(e)(2)) The new test procedure will describe the efficiency of a ballast in terms of a new metric, BLE. To ensure that the standards developed in the ongoing standards rulemaking account for any changes to the test procedure, DOE is developing the standards based on the measured BLE generated by the active mode test procedure established in this rulemaking. The revised test procedure, to be published as Appendix Q1 of 10 CFR part 430 Subpart B, will be required concurrent with the compliance date of any upcoming amendments to the fluorescent lamp ballast standards. DOE is required by a consent decree to issue any amended fluorescent lamp ballast standards by June 30, 2011.

Until use of Appendix Q1 is required, manufacturers should continue testing these ballasts using the test procedure at Appendix Q to determine compliance with existing standards. In the SNOPR, DOE proposed to make minor updates to the existing test procedure, published at Appendix Q to Subpart B of part 430. The final rule does not affect this proposal. DOE is amending the reference to ANSI C82.2–1984 in the existing test procedure (appendix Q) to ANSI C82.2–2002. DOE does not believe the updated standard will impose increased testing burden or alter the measured BEF of fluorescent lamp ballasts. The amendments to Appendix Q are effective on June 3, 2011, and manufacturers may not make any representation regarding fluorescent lamp ballast efficiency unless such ballast has been tested in accordance with the final rule provisions in Appendix Q after October 31, 2011. See 42 U.S.C. 6293(c).

In addition, the test procedures for any ballasts that operate in standby mode are also located in Appendix Q. Manufacturers must continue to use the standby and off mode procedures in Appendix Q for certification purposes at

this time. DOE has also included the test procedures for any ballasts that operate in standby mode in Appendix Q1. When use of the procedures in Appendix Q1 are required for certification, manufacturers can continue to use the same procedure in Appendix Q1 and will no longer need to refer to Appendix Q for that procedure.

III. Discussion

A. Appendix Q Test Procedure

The ballast test procedure (in Appendix Q to Subpart B of 10 CFR part 430 determines the performance of a fluorescent lamp ballast based on light output measurements and ballast input power. The metric used is called ballast efficacy factor (BEF). BEF is relative light output divided by the power input of a fluorescent lamp ballast, as measured under test conditions specified in ANSI standard C82.2–1984, or as may be prescribed by the Secretary. (42 U.S.C. 6291(29)(C))

The BEF metric uses light output of the lamp-and-ballast system instead of ballast electrical output power in its calculation of the performance of a ballast. To measure relative light output, ANSI C82.2–1984 directs the user to measure the photocell output of the test ballast operating a reference lamp and the light output of a reference ballast operating the same reference lamp. Dividing photocell output of the test ballast system by the photocell output of the reference ballast system yields relative light output or ballast factor. Concurrent with measuring relative light output, the user is directed to measure ballast input power. BEF is then calculated by dividing relative light output by input power and multiplying by 100. A ballast that produces same light output as another ballast (operating the same lamp type and number of lamps) with less input power will have a larger BEF.

B. Appendix Q1 Test Procedure—Metric

1. Ballast Luminous Efficiency

In the SNOPR, DOE proposed a new metric to describe the efficiency of a ballast called ballast luminous efficiency (BLE). The BLE metric and test procedure were based on the NEMA lamp-based ballast efficiency (BE) test procedure considered in the test procedure NOPR. The BLE metric is equal to ballast input power divided by the lamp arc power of a lamp-and-ballast system. DOE also proposed that for low-frequency ballasts the quantity ballast input power divided by lamp arc power be multiplied by 0.9 to account for the approximately 10% increase in lighting efficacy associated with high-

frequency lamp operation. In this final rule, DOE establishes lamp specific low-frequency adjustment factors to more accurately approximate this increase in lighting efficacy. DOE continues to use the definition of high frequency in ANSI C82.13–2002, which includes ballasts operating at frequencies of 10 kHz or more.

DOE proposed the BLE test procedure because it reduced measurement variation and testing burden compared to the existing test procedure and other alternatives. In contrast to BEF and relative system efficacy (RSE), the BLE metric could be used to compare the efficiency across many different types of ballasts. RSE and BEF can only be used to make direct comparisons between ballasts that operate certain lamp types, while BLE can be used for comparisons among ballasts that operate all lamp types. DOE believed that the use of a lamp-and-ballast system allowed the ballast to operate at its natural operating point and would more accurately assess ballast performance than other methods in which the ballast test load is a resistor. DOE also believed that the use of electrical measurements and the calculation of BLE reduced the impact of lamp manufacturing variation on the efficiency descriptor compared to the existing test procedure.

NEMA commented on the assignment of an adjustment factor based on lamp operating frequency, stating that low frequency should be defined as 60 Hertz (Hz) and high frequency should be defined as equal to or higher than 25 kHz. NEMA stated that it knows of no ballasts that operate between 10 and 25 kHz, and that most ballasts operate above 40 kHz to avoid frequencies used by other devices between 32 and 40 kHz and anti-theft devices above 50 kHz. NEMA also commented that luminaire manufacturers have defined a specification for high frequency ballasts that avoid frequencies of concern. (NEMA, No. 20 at p. 3¹)

In its test data, DOE identified ten electronic ballasts (manufactured by five different companies) that operate between 20 and 25 kHz, and intends to include these ballasts in the high frequency category. These ballasts operate F96T12/ES, F96T8HO, F96T8HO/ES, and F96T12HO cold temperature lamps. Therefore, DOE continues to use the definition of high

frequency provided by ANSI C82.13–2002, which includes ballasts operating at frequencies of 10 kHz or more. DOE is not changing its proposed definition for low-frequency ballasts, which is defined as a ballast that operates at a supply frequency of 50 to 60 Hz and operates the lamp at the same frequency as the supply.

Other than the high frequency issue discussed above, comments received on the metric changes proposed in the SNOPR were generally positive. Though the CA IOUs and NEEA noted their preference for a test procedure that continued to relate energy consumption to the light output of the lamp and ballast system, they supported the SNOPR proposal of lamp-based BLE. The California IOUs (CA IOUs) commented that the test procedure proposed in the SNOPR represented a significant improvement over the procedure proposed in the NOPR, and the Northwest Energy Efficiency Alliance (NEEA) fully supported DOE's proposal of a metric and test procedure that focus on the electrical inputs and outputs of the ballast. (CA IOUs, No. 19 at p. 1, 2; NEEA, No. 18 at p. 1, 4) The CA IOUs and NEEA concurred with DOE's observations and arguments regarding the drawbacks of the resistor-based test procedure and the advantages of the proposed lamp-based ballast efficiency test procedure. (CA IOUs, No. 19 at p. 2; NEEA, No. 18 at p. 2) The Natural Resources Defense Council (NRDC) also supported DOE's proposal to measure lamp arc power rather than using resistor banks to simulate lamps because it will yield more accurate and consistent results across ballast types. (NRDC, No. 21 at p. 1) The CA IOUs and the NRDC also agreed with DOE that the new metric will allow for increased comparison among ballasts of different ballast factors and among ballasts intended for operation with different numbers of lamps. Both organizations believe this will make the new metric more useful in designing and implementing rebate programs, and will also make it much easier to set standard levels of compliance for government or non-government procurement policies that specify high efficiency ballasts. (CA IOUs, No. 19 at p. 2; NRDC, No. 21 at p. 1) Based on the general support for the BLE metric and its use of lamp loads rather than resistor loads, DOE establishes use of the BLE metric in the final rule.

DOE also received comment on whether the proposed name of the metric accurately conveys what ballast properties the metric describes. NEEA, the CA IOUs, and NRDC were dissatisfied with the name "ballast

luminous efficiency" suggested for the new metric. The new method adjusts the ratio of lamp arc power to ballast input power for low-frequency ballasts to account for the reduced light output per unit of power input for those ballasts but does not involve the measurement of light output. These organizations commented that the term "luminous" suggests the continued use of light output as part of the test procedure and is thus misleading. (NEEA, No. 18 at p. 1; CA IOUs, No. 19 at p. 1; and NRDC, No. 21 at p. 1) NEEA suggested that the alternate names "ballast electrical efficiency", "ballast component efficiency", and "ballast-lamp efficiency" would be more descriptive of the proposed metric since the operating frequency of the ballast is an electrical characteristic with inherent lamp/ballast system efficiency impacts. (NEEA, No. 18 at p. 1) The CA IOUs suggested the names "ballast lamp efficiency" and "ballast arc efficiency" as more accurate conveyors of the basis of the test measurement. (CA IOUs, No. 19 at p. 1)

DOE disagrees with NEEA, NRDC, and the CA IOUs and believes ballast luminous efficiency is the best description of the metric. In addition to describing electrical losses, the BLE metric also accounts for the lamp efficacy difference between low and high frequency operation. The term "luminous" relates to BLE's treatment of lamp operating frequency's impact on lamp efficacy, and the term "efficiency" relates to BLE's treatment of electrical losses within the ballast. The other names suggested do not describe both of these elements. Therefore, DOE uses the term ballast luminous efficiency in this final rule.

2. BEF to BLE

In the SNOPR, DOE proposed a method for correlating the existing BEF standards to BLE. Part of this correlation includes accounting for a frequency adjustment factor (the SNOPR proposed 0.9 for low frequency ballasts) DOE included in its BLE proposal. When converting a low-frequency BEF to BLE, the SNOPR proposed BEF must be multiplied by 0.9 to convert to BLE. NEMA commented that DOE may be incorrectly using the 0.9 factor in its calculations of high frequency gains in efficiency. NEMA stated that different arc powers specified for high frequency and low frequency operation on the same lamp are specified at the same light output, which implies that there is no further need to correct for high frequency gains because these are already accounted for in the different arc power specifications. (NEMA, No.

¹ A notation in the form "NEMA, No. 20 at p. 3" identifies a written comment that DOE has received and has included in the docket of this rulemaking or a written docket submission. This particular notation refers to a comment: (1) Submitted in writing on December 27, 2010; (2) in document number 20 in the docket of this rulemaking; and (3) appearing on page 3 of the document.

20 at p. 2) NEMA also commented that DOE multiplied the low frequency BLE by 0.9 when it should have divided it by 0.9 to generate the required BLE needed to attain the same light output and hence BEF because low frequency operation has lower luminous efficacy. (NEMA, No. 20 at p. 2)

DOE believes there is some confusion concerning the lamp arc wattages and adjustment factor used in the calculation of BLE from BEF. A single BEF standard is more stringent for low frequency systems than for high frequency systems. Therefore, if the low and high frequency system have the same BEF and BF, the quantity lamp arc power divided by ballast input power would be larger for the low frequency system than for the high frequency system. In DOE's conversion technique, multiplication by different reference lamp arc powers results in a higher lamp arc power divided by ballast input power quantity for the low frequency system. However, DOE has defined BLE to include an adjustment factor based on lamp operating frequency. DOE multiplies the quantity lamp arc power divided by ballast input power by the adjustment factor to calculate BLE. This adjustment factor accounts for the difference in lamp efficacy between low and high frequency operation (because lamp efficacy cannot be assessed through electrical measurements of the ballast). Though the BLE corresponding to a low frequency BEF may be smaller than a BLE corresponding to a high frequency BEF, the low-frequency BLE is still more stringent because of the adjustment factor. The adjustment factor allows a single BLE standard to be more stringent for low frequency systems than for high frequency systems, consistent with the implications of a single BEF standard.

NEEA stated that while they understand DOE's proposal (and industry's assertions) with regard to the ability to derive BEF ratings from the proposed BLE ratings, they would like some assurance about the continuing availability of the BEF ratings, and the integrity of whatever values are reported when they are not certified values. The NEEA urged the DOE to establish the appropriate inputs for the calculations of other metrics (e.g. BE and BEF) from the measured proposed BLE metric before the new test procedure goes into effect. (NEEA, No. 18 at p. 2) The CA IOUs and NRDC commented that the SNO PR did not contain evidence that DOE has conducted significant testing of ballasts to compare their BEF results with their BLE results to confirm the accuracy of DOE's proposed method for conversions. These organizations

recommended that such testing be done before DOE issues the NOPR for ballast efficiency standards. (CA IOUs, No. 19 at p. 2; NRDC, No. 21 at p. 1)

The conversion of BEF to BLE and vice versa was necessary for DOE to confirm that any proposed standards in the standards rulemaking were more stringent than existing standards (i.e., to avoid backsliding), consistent with 42 USC 6295(o)(1). The standards rulemaking will provide more details on DOE's analysis of backsliding. DOE analyzed its BEF to BLE conversion results and presents the comparison in this test procedure final rule. DOE converted the tested BLE data for all of its test ballasts to BEF using the final rule method of conversion and compared the calculated BEF values to measured BEF values. DOE found that the average BEF converted from BLE was 2.3 percent higher than the average tested BEF. The standard deviation of the population of percent differences between converted and tested BEFs was 0.043. DOE believes that the variation around this average can be explained by the expected variation in the BEF test method and the BLE test method. DOE notes that manufacturers and industry members can continue to measure BEF or can develop their own conversion methods for use in lighting design. DOE also understands that NEMA is independently developing its own BLE to BEF conversion technique.

TABLE III.1—BEF CONVERSION METHOD VALIDATION

Average: BLE converted to BEF – Tested BEF	0.033
Average: (BLE converted to BEF – Tested BEF)/Tested BEF	2.3%
Standard deviation: (BLE converted to BEF – Tested BEF)/Tested BEF	0.042

C. Appendix Q1 Test Procedure—Ballast Factor

In the SNO PR, DOE proposed a method for calculating the ballast factor (BF) of a system by dividing the measured lamp arc power on the test ballast by the measured lamp arc power on a reference ballast. In cases where reference ballast operating conditions were unavailable, the SNO PR provided a reference lamp power (specific to the ballast type and operating frequency) from an ANSI standard or from empirical results. The ballast factor measurement was described in detail in section III.D of the SNO PR. Particular lamp and ballast pairings were specified for both the BLE and BF measurements.

Lighting designers commonly use the BF specification to calculate the total system lumen output for their projects. NEEA and the CA IOUs commented that with the proposed test method, calculation of lamp and ballast system lumens by multiplying the rated lamp lumen output by the candidate ballast BF would not be valid for lamps that were rated with a low frequency reference ballast, such as full wattage 4-foot T8s. Both organizations suggested that this problem could be addressed by simultaneously updating the reference ballasts for full wattage T8 lamps to a high frequency ballast but stated that this is probably not possible in this rulemaking because a change in the way rated lamp lumen output is measured would require a new and separate rulemaking. NEEA and the CA IOUs recommended that DOE not change the BF calculation method unless it is able to address the stakeholder concerns. (NEEA, No. 18 at pp. 2–3; CA IOUs, No. 19 at pp. 3–4)

The CA IOUs asked for guidance concerning when a reference ballast should be used to determine BF versus when a number from the proposed Table A (which contains the reference arc power values provided in ANSI C78.81–2010 and IEC 60081 Ed. 5.0) could be used for BF calculation, and requested more information about how the values in the Table A were developed. The CA IOUs also commented that some values in the proposed Table A have two significant digits while others have none, and suggested this be corrected so all values have the same number of significant digits. The CA IOUs suggested DOE conduct research to obtain additional reference ballast operating characteristics at both low and high frequency for key lamp types that are currently lacking this information in ANSI C78.81–2010. This would include high frequency reference ballast operating characteristics for F32T8 lamps. (CA IOUs, No. 19 at p. 4) NRDC supported the CA IOUs' recommendation to find an alternative to Table A. (NRDC, No. 21 at p. 2)

The CA IOUs agreed with DOE that it is important to measure lamp arc power on the test ballast and the reference ballast with the same lamp because of manufacturing variation in the lamps, and commented that using a fixed denominator would unnecessarily decrease the accuracy of the ballast factor test. (CA IOUs, No. 19 at p. 4) NEEA and the CA IOUs expressed concern that the proposed test procedure introduces variability by forcing a comparison of measured test values against fixed integer reference

lamp arc values in the proposed Table A. (CA IOUs, No. 19 at p. 4) NEEA commented that this seemed incongruous with DOE's goal of reducing testing variability. NEEA also pointed out that DOE had itself expressed reservations about the procedure and agreed with DOE's preference for measuring lamp arc power under both reference and test ballast/lamp conditions. (NEEA, No. 18 at pp. 2–3)

NEMA disagreed with NEEA and the CA IOUs, expressing concern about DOE's proposal to have BF equal the ratio of measured lamp arc powers on test and reference ballasts, stating that ballasts will respond to each lamp differently because every lamp has a characteristic power output. NEMA also commented that determining a reference lamp by light output and not a predetermined wattage introduces photometric variation, and suggested use of a predetermined wattage to give a BF of one from which everything should be determined. NEMA commented that if a center point wattage across all manufacturers' lamps were found, it should be the value used for BF equal to one. NEMA suggested this wattage could be 29 W for a full-wattage 32 W T8 lamp operated on a high frequency electronic ballast. NEMA recognized that variations in reference lamp parameters will affect BF calculations in some cases, but stated that the error introduced into a BF calculation by the variations should not be enough to influence which classification a ballast design falls into. (NEMA, No. 20 at p. 3)

The CA IOUs expressed concern that DOE's proposal to change the way BF is calculated has not been adequately vetted by the lighting industry. The CA IOUs commented on the lack of evidence that DOE has conducted significant testing to compare the proposed ballast factor correction method with the current one, and suggested DOE conduct the testing and publish the results to demonstrate the impacts of the new procedure. (CA IOUs, No. 19 at p. 3) The CA IOUs also commented that significant change to the ballast factor metric could affect its utility in lighting design, and recommended that DOE schedule a public meeting in early 2011 to discuss this issue. NEEA stated that lighting designers, who will be the most affected by the ballast factor calculation change, have not been sufficiently included in the discussion. NEEA and the CA IOUs suggested that DOE consult representatives of the International Association of Lighting Designers (IALD) and the Illuminating Engineering

Society of North America (IESNA). (NEEA, No. 18 at p. 3; CA IOUs, No 19 at p. 3)

DOE believes there may have been some misunderstanding of the SNOPR BF calculation method. If a candidate ballast operates at high frequency, then a high frequency reference arc power value would be used to calculate ballast factor. If the candidate ballast operates at low frequency, then a low frequency reference lamp arc power value would be used. In addition, DOE proposed that if ANSI C78.81 provided reference ballast operating conditions at the same frequency as the candidate ballast, then the reference lamp arc power value could be measured directly. Based on these proposals, reference lamp arc power values always correspond to the same operating frequency as the candidate ballast. Nevertheless, in the fluorescent lamp ballast standards NOPR, DOE proposed a new product class structure that no longer makes use of BF. (76 FR 20090, April 11, 2011) In this final rule, therefore, DOE is not prescribing a BF measurement methodology. DOE notes that manufacturers and industry members can continue to measure BF using their preferred methods depending on the demands of the market and industry.

D. Appendix Q1 Test Procedure—Requirements

1. Test Conditions

In the SNOPR, DOE proposed that testing be conducted at 25 degrees Celsius \pm 2.0 degrees and in a draft-free environment according to ANSI C78.375–1997.² These conditions provide for mostly uniform electrical operating characteristics for the lamp-and-ballast system. In addition, DOE proposed that ballasts be tested using the electrical supply characteristics found in section 4 of ANSI C82.2–2002 with the following changes: (1) Ballasts capable of operating at a single voltage would be tested at the rated ballast input voltage; (2) users of universal voltage ballasts would disregard the input voltage directions in section 4.1 of ANSI C82.2–2002 that indicate a ballast capable of operating at multiple voltages should be tested at both the lowest and highest USA design center voltage; and (3) manufacturers use particular revisions to the normative references associated with ANSI C82.2–2002 (see section III.D.6 for additional detail). Instead of testing universal voltage ballasts at the voltages indicated in ANSI C82.2–2002, DOE proposed that

²“American National Standard for Fluorescent Lamps—Guide for Electrical Measurements,” approved September 25, 1997.

testing ballasts at a single voltage would be more appropriate and less burdensome. DOE noted that 277 V is the most common input voltage for commercial ballasts and that 120 V is the most common for residential ballasts and commercial cold-temperature outdoor sign ballasts. Therefore, DOE proposed that all universal voltage commercial ballasts be tested at 277 V and that universal voltage residential and commercial cold-temperature outdoor sign ballasts be tested at 120 V.

The CA IOUs approved of DOE's proposal that the BLE calculation for universal voltage commercial ballasts be based on testing at 277 volts and testing of universal voltage residential ballasts and outdoor cold temperature sign ballasts be conducted at 120 volts. They believe this will add clarity to the test procedure because the value reported for compliance purposes is now specified. However, the CA IOUs commented that manufacturers of universal voltage ballasts should be required to publish input wattage for operation at both the upper and lower range of universal voltage ballasts in their product literature because some commercial spaces have 120 volt service in significant portions of the building, such as bathrooms. Since input watts can vary by one to two watts depending on the voltage, the CA IOUs believe it would be useful in lighting design to consider input watts at both 277 and 120 volts. (CA IOUs, No. 19 at pp. 2–3)

Because DOE has not received adverse comment to its test conditions proposal in the SNOPR, the test condition requirements for this final rule are unchanged. With regards to the comment concerning the publication of input wattage for operation at both the upper and lower range of universal voltage ballasts, the Federal Trade Commission has statutory authority to establish labeling requirements for fluorescent lamp ballasts. Manufacturers are also prohibited from making any representation regarding the energy efficiency of a product unless the product has been tested according to the DOE test procedure and the representation fairly discloses the results of such testing. (42 U.S.C. 6293(c)).

2. Test Setup

NEEA, the CA IOUs, and NRDC supported the proposed method of test wiring for programmed and rapid start ballasts without cathode cut-out. These organizations concurred with DOE's observation that the proposed procedure isolates lamp arc voltage by capturing heating energy in the input power measurement, but not in the output

power measurement, and will appropriately measure the relative efficiency of ballasts with cathode heating. (NEEA, No. 18 at p. 2; CA IOUs, No. 19 at p. 2; and NRDC, No. 21 at p. 2) Based on the comments received in support of the SNOPR test setup proposal, the setup required in the final rule does not change.

DOE is adding one clarification to its SNOPR setup proposal with regards to the lamp type paired with sign ballasts. In the SNOPR, DOE proposed that all ballasts, including sign ballasts, be tested with the most common wattage lamp typically used with that ballast type. For sign ballasts, DOE identified 110 W 8-foot T12 lamps and 86 W 8-foot T8 lamps as being the most common. However, DOE notes that some sign ballasts are capable of operating both T12 and T8 lamps. Based on interviews with manufacturers, DOE believes the T12 lamp pairing is the most common. Therefore, in the final rule, sign ballasts capable of operating T12 and T8 lamps shall be paired with a 110 W 8-foot T12 lamp for the purposes of determining compliance with energy conservation standards. Sign ballasts capable of only operating T8 or only T12 lamps shall be

operated with the diameter lamp they are designed to operate.

3. Test Method

The test method required in the final rule is unchanged from the SNOPR proposal. Once the lamp-and-ballast system is connected and attached to the measurement instrumentation, the ballast must operate a fluorescent lamp for a minimum of fifteen minutes to a maximum of one hour until stability is reached. Measurements of lamp arc voltage, lamp arc current, and lamp arc power must be taken every one second during the stabilization period. Once the percent difference between the minimum and maximum values for voltage, current, and power do not exceed one percent over a four minute moving window, the system is considered stable. Allowing the lamp and ballast system to reach its steady state operating point will provide a more accurate assessment of ballast performance in the field. If the system does not stabilize, a new ballast sample is selected and the test is repeated.

After the system has stabilized, the measured input parameters are voltage (RMS³), current (RMS), power, and power factor measured in accordance with ANSI C82.2–2002. The measured

output parameters include lamp arc voltage, current, and power. Lamp arc current and voltage measurements are taken at the specified locations according to the test setup. Frequency of the output waveform delivered to the lamp by the ballast is also measured.

NEMA commented that a text correction is needed on page 71578 of the SNOPR, in the section describing lamp arc voltage measurement in the test circuit setup. DOE stated that during lamp arc voltage measurement, it is assumed the arc begins near the center of the ballast cathodes. The sentence should read: “The voltage divider would provide a position in the circuit to measure the lamp arc voltage assuming the arc begins near the center of the lamp (instead of ballast) cathodes.” (NEMA, No. 20 at p. 4) DOE agrees with NEMA that the sentence should have referenced lamp cathodes rather than ballast cathodes.

4. Calculations

As described in Equation 1 below, ballast luminous efficiency is equal to total lamp arc power, divided by ballast input power, multiplied by 100, and then multiplied by a lamp operating frequency correction factor (β).

$$\text{Ballast Luminous Efficiency (\%)} = \frac{\text{Total Lamp Arc Power}}{\text{Ballast Input Power}} \times 100 \times \beta \quad \text{Ballast Luminous Efficiency (\%)} = \frac{\text{Total Lamp Arc Power}}{\text{Ballast Input Power}} \times 100 \times \beta$$

Equation 1

In the SNOPR, DOE proposed that the symbol β be equal to 0.9 for low-frequency ballasts and equal to 1.0 for high-frequency ballasts. NEMA commented that because the 0.9 correction factor for low frequency ballasts is based on the IESNA handbook reference to F40T12 lamps, it should not be applied broadly to all lamp types. The 10 percent gain for the F40T12 is due to a decrease in “end losses” and an increase in column efficacy due to a lower operating power. NEMA commented that the proportional gain in efficacy due to decreased “end losses” will be different for different lamp types because of differences in column voltage. Additionally, the increase in column efficacy from a reduction in column power may not apply to all other lamps. NEMA stated that it would submit additional comments after it had time to verify if a 0.93 correction factor would be appropriate for T8 lamps, and that no correction factor should be needed for

T5 lamps because they are designed only for high frequency operation. DOE did not receive these additional comments from NEMA on appropriate frequency adjustment factors. Finally, NEMA stated that for ballasts meeting ANSI C82.11 and C82.1, there should be no other appreciable effect on fluorescent lamp efficacy from lamp current crest factor, wave form, and lamp operating frequency. (NEMA, No. 20 at pp. 2–3)

The CA IOUs and NRDC stated that DOE’s proposal to apply a factor of 0.9 to the efficiency measurements of low frequency ballasts is an acceptable proxy for light measurements to assess the benefits of high frequency operation. The CA IOUs commented that they do not have data to indicate that the variation in lamp light output due to variations in crest factor or wave shape during high frequency operation is significant. (CA IOUs, No. 19 at p. 2 and NRDC, No. 21 at p. 2)

In light of NEMA’s comments, DOE establishes different low frequency correction factors for the different lamp types operated by ballasts within the scope of this final rule. DOE believes that these factors more accurately represent the difference in arc power between high frequency and low frequency operation for the same light output. The adjustment factor is equal to high frequency lamp arc power divided by low frequency lamp arc power—specific to each lamp type. DOE used ANSI lamp data when available and empirical data when it was not. To derive correction factors for when ANSI lamp data is unavailable for both high and low frequency, DOE operated a lamp using the ANSI reference ballast settings at the given rating frequency (either high or low frequency) and recorded the light output. DOE then switched the same lamp to a reference ballast of the frequency type not provided by ANSI and adjusted the ballast settings to match the light output

³Root mean square (RMS) voltage is a statistical measure of the magnitude of a voltage signal. RMS

voltage is equal to the square root of the mean of

all squared instantaneous voltages over one complete cycle of the voltage signal.

with the output obtained using the first ballast. DOE recorded the lamp arc power once the light output was matched.

TABLE III.2—FREQUENCY ADJUSTMENT FACTORS

Ballast type	Nominal lamp wattage	Lamp diameter and base	Frequency adjustment factor	
			Low-frequency	High-frequency
Ballasts that operate straight-shaped lamps (commonly referred to as 4-foot medium bipin lamps) with medium bipin bases and a nominal overall length of 48 inches.	32	T8 MBP	0.94	1.0
	34	T12 MBP	* 0.93	1.0
Ballasts that operate U-shaped lamps (commonly referred to as 2-foot U-shaped lamps) with medium bipin bases and a nominal overall length between 22 and 25 inches.	32	T8 MBP	0.94	1.0
	34	T12 MBP	* 0.93	1.0
Ballasts that operate rapid-start lamps (commonly referred to as 8-foot high output lamps) with recessed double contact bases and a nominal overall length of 96 inches.	86	T8 HO RDC	* 0.92	1.0
	95	T12 HO RDC	* 0.94	1.0
Ballasts that operate instant-start lamps (commonly referred to as 8-foot slimline lamps) with single pin bases and a nominal overall length of 96 inches.	59	T8 slimline SP	0.95	1.0
	60	T12 slimline SP	* 0.94	1.0
Ballasts that operate straight-shaped lamps (commonly referred to as 4-foot miniature bipin standard output lamps) with miniature bipin bases and a nominal length between 45 and 48 inches.	28	T5 SO Mini-BP	* 0.95	1.0
	54	T5 HO Mini-BP	* 0.95	1.0
Ballasts that operate straight-shaped lamps (commonly referred to as 4-foot miniature bipin high output lamps) with miniature bipin bases and a nominal length between 45 and 48 inches.	86	T8 HO RDC	* 0.92	1.0
	110	T12 HO RDC	* 0.94	1.0

MBP, Mini-BP, RDC, and SP represent medium bipin, miniature bipin, recessed double contact, and single pin, respectively.
* Empirically derived.

5. Updates to Existing Test Procedure

DOE is not changing the proposed updates to the existing test procedure from the SNOPR in this final rule. DOE is updating the references to ANSI standards for the existing light-output-based test procedure. DOE is using the most recent versions of these standards, namely ANSI C82.2–2002, ANSI C82.11–2002⁴, and ANSI C82.1–2004. The amendments to the existing test procedure in Appendix Q to Subpart B of 10 CFR part 430 will be effective 30 days after publication of the test procedure final rule.

6. Normative References for ANSI C82.2–2002

DOE is not changing its proposals regarding the specification of normative references to be used with ANSI C82.2–2002 from the SNOPR in this final rule. DOE is amending the existing fluorescent lamp ballast test procedure in Appendix Q to incorporate references to ANSI C82.2–2002 and including

references to ANSI C82.2–2002 in the new appendix Q1. In examining the ANSI standard, DOE found that within ANSI C82.2–2002, there are references to other ANSI standards. In particular, section 2 of ANSI C82.2–2002 states that “when American National Standards referred to in this document [ANSI C82.2–2002] are superseded by a revision approved by the American National Standards Institute, Inc. the revision shall apply.” Revisions to these normative standards could potentially impact compliance with energy conservation standards by changing the tested value for energy efficiency. Therefore, DOE is specifying the particular versions of the ANSI standards that will be used in conjunction with ANSI C82.2–2002. DOE is using ANSI C78.81–2010, ANSI C82.1–2004, ANSI C82.11–2002, and ANSI C82.13–2002 in support of ANSI C82.2–2002. All other normative references are as directly specified in ANSI C82.2–2002. These specifications will apply to the ANSI C82.2–2002 references in Appendix Q and to the ANSI C82.2–2002 references in Appendix Q1.

E. Burden To Conduct the Test Procedure

EPCA requires that any test procedures prescribed or amended under this section be reasonably designed to produce test results that measure energy efficiency, energy use or estimated annual operating cost of a covered product during a representative average use cycle or period of use. Test procedures must also not be unduly burdensome to conduct.” (42 U.S.C. 6293(b)(3)). Today’s final test procedure measures the performance of a ballast by computing the ratio of lamp arc power to ballast input power and adjusting for lamp operating frequency. The test procedure is less burdensome than the existing procedure largely because of the simplicity of electrical measurements compared to photometric measurements. In addition, the lamp loads are less expensive than precision resistor loads proposed in the NOPR and are already a common item used in test facilities. The assessment of testing burden is discussed in more detail with reference to small businesses in section IV.B. NEEA commented that it was

⁴“American National Standards for Lamp Ballasts—High Frequency Lamp Ballasts—Supplements,” approved January 17, 2002.

pleased with the basics of the proposed test procedure and supported a test procedure that does not unduly burden manufacturers. (NEEA, No. 18 at p. 1)

To further ensure that the test procedure in this final rule is not unduly burdensome to conduct, DOE is not changing the minimum sample size (four) for generating a reported value or to the reported value itself. Currently, to demonstrate compliance with energy conservation standards, manufacturers must first test four examples of the basic model. The reported value of BLE is then equal to either the lower 99% confidence interval limit divided by 0.99 or the mean of the four values, whichever is smaller.

F. Impact on Measured Energy Efficiency

In any rulemaking to amend a test procedure, DOE must determine whether the proposed test procedure would alter the measured energy efficiency of any covered product as determined under the existing test procedure. (42 U.S.C. 6293(e)(1)) If DOE determines that the amended test procedure would alter the measured efficiency of a covered product, DOE must amend the applicable energy conservation standard accordingly. (42 U.S.C. 6293(e)(2)) This final rule active mode test procedure changes the metric used to describe the energy efficiency of a ballast. DOE is currently amending energy conservation standards for fluorescent lamp ballasts in the standards rulemaking. In that rulemaking, DOE is considering standards based on the measured efficiency of the ballast in accordance with the test procedure prescribed in this active mode test procedure rulemaking. The BLE test procedure final rule will not affect compliance with existing energy conservation standards because manufacturers will not be required to use the new test procedure until the date manufacturers are required to comply with any amended standards.

G. Scope of Applicability

Today's test procedure final rule is applicable to the fluorescent lamp ballasts covered in the proposed scope of coverage outlined in the fluorescent lamp ballast standard NOPR, which includes ballasts that operate F32T8, F34T12, F28T5SO, F54T5HO, F96T8/ES, F96T12/ES, F96T8HO, F96T12HO/ES, and F96T12HO lamps. 76 FR 20090 (April 11, 2011). These ballasts can operate between one and six lamps and are used in commercial, residential, and cold-temperature outdoor sign applications. For the test procedure in

this rulemaking, DOE is establishing particular test setups and calculations depending on type of ballast, as described in more detail in section III.D. For example, DOE is specifying certain fluorescent lamps and numbers of these lamps to be paired with certain ballasts for determining ballast performance.

H. Certification and Enforcement

In the test procedure SNOPR, DOE proposed the measurement of BLE using electrical measurements of a lamp and ballast system. DOE believes this test procedure to be clearer and less burdensome to conduct compared to the existing method which may result in increased compliance. DOE also proposed that test facilities conducting compliance testing in accordance with amended standards promulgated by the ongoing standards rulemaking be National Volunteer Laboratory Accreditation Program (NVLAP) accredited, a program administered by the National Institute of Standards and Technology (NIST), or accredited by an organization recognized by NVLAP.

NVLAP accreditation is a finding of laboratory competence, certifying that a laboratory operates in accordance with NVLAP management and technical requirements. The NVLAP program is described in 15 CFR part 285, and encompasses the requirements of ISO/IEC 17025.⁵ NVLAP (or an organization recognized by NVLAP) accreditation is currently required for laboratories providing certification and compliance data for general service fluorescent, general service incandescent, and incandescent reflector lamps. In the SNOPR, DOE stated that either of these accreditation requirements would ensure that all the data DOE uses in its rulemaking comes from standardized and quality controlled sources, increasing confidence in the precision of the data and limiting variations due to differences between testing laboratories. DOE determined that NVLAP imposes fees of \$9000 and \$8000 on years one and two of accreditation. For the years following, the fees alternate between \$5000 and \$8000, with the \$8000 fee corresponding to the on-site evaluation required every other year. Fees for other accreditation organizations are expected to be similar. DOE invited comment on the benefits and burden imposed by the requirement that certification and compliance data come from an NVLAP

or NVLAP recognized organization accredited laboratory.

NEMA agreed with DOE that there should be an accreditation requirement for laboratories generating certification and compliance data, but does not believe NVLAP accreditation or recognition should be the only option. NEMA recommended that the accreditation requirements should read: "Laboratory accreditation is by ISO17025 accreditation on ballast energy efficiency procedures such as Underwriter Laboratories, Council of Canada, etc * * *" (NEMA, No. 20 at p. 4).

NEEA and NRDC strongly supported the proposed requirement that all certification and compliance testing be done at NVLAP accredited or recognized laboratories to establish a testing regime that will produce accurate and repeatable results. (NEEA, No. 18 at p. 4 and NRDC, No. 21 at p. 2) The CA IOUs also agreed with DOE, noting that the overwhelming majority of ballasts tested by DOE showed significantly higher measured BEFs than their reported catalog values. The CA IOUs believe that requiring testing from accredited third party labs will help ensure testing consistency. (CA IOUs, No. 19 at p. 5) Earthjustice agreed with DOE that requiring NVLAP accreditation or recognition for labs that do certification and compliance data will increase the integrity of test data, adding that this requirement is especially important given DOE's proposal to allow manufacturers to manufacture and test their own products. Earthjustice believes that the benefits of the requirement outweigh any potential burdens because the added per-unit cost would be a negligible fraction of a penny. (Earthjustice, No. 22 at p. 1)

In this final rule, DOE is amending the laboratory accreditation requirements to be by ISO17025 accreditation on ballast energy efficiency procedures. Accreditation must be done by NVLAP or a NVLAP-recognized organization, Underwriter Laboratories, or Council of Canada. DOE invites interested parties to suggest whether organizations should be added or removed from the list of accepted accrediting bodies which could be incorporated in a future test procedure amendment. During manufacturer interviews, DOE learned that gaining NVLAP accreditation could take between six months and two years. This final rule imposes laboratory accreditation requirements only for compliance testing using Appendix Q1.

⁵ International Organization for Standardization/ International Electrotechnical Commission, *General requirements for the competence of testing and calibration laboratories*. ISO/IEC 17025.

IV. Procedural Issues and Regulatory Review

A. Review Under Executive Order 12866

The Office of Management and Budget has determined that test procedure rulemakings do not constitute "significant regulatory actions" under section 3(f) of Executive Order 12866, Regulatory Planning and Review, 58 FR 51735 (Oct. 4, 1993). Accordingly, this action was not subject to review under the Executive Order by the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget (OMB).

B. Review Under the Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) requires preparation of an initial regulatory flexibility analysis (IFRA) for any rule that by law must be proposed for public comment, unless the agency certifies that the rule, if promulgated, will not have a significant economic impact on a substantial number of small entities. As required by Executive Order 13272, "Proper Consideration of Small Entities in Agency Rulemaking," 67 FR 53461 (August 16, 2002), DOE published procedures and policies on February 19, 2003, to ensure that the potential impacts of its rules on small entities are properly considered during the DOE rulemaking process. 68 FR 7990. DOE has made its procedures and policies available on the Office of the General Counsel's Web site: <http://www.gc.doe.gov>.

DOE certified to the Office of Advocacy of the Small Business Administration (SBA) that the proposed test procedure for ballasts would not have a significant economic impact on a substantial number of small entities, and updated that certification in the SNOPR. The factual basis for that certification is as follows:

The SBA has set a size threshold for manufacturers of fluorescent lamp ballasts that defines those entities classified as "small businesses" for the purposes of the Regulatory Flexibility Analysis. DOE used the SBA's small business size standards to determine whether any small manufacturers of fluorescent lamp ballasts would be subject to the requirements of the rule. 65 FR 30836, 30850 (May 15, 2000), as amended at 65 FR 53533, 53545 (September 5, 2000) and codified at 13 CFR part 121. The size standards are listed by North American Industry Classification System (NAICS) code and industry description and are available at http://www.sba.gov/idc/groups/public/documents/sba_homepage/

serv_sstd_tablepdf.pdf. Fluorescent lamp ballast manufacturing is classified under NAICS 335311, "Power, Distribution, & Specialty Transformer Manufacturing." The SBA sets a threshold of 750 employees or less for an entity to be considered as a small business for this category.

To identify potential small manufacturers as defined by SBA, DOE conducted a market survey using all available public information. DOE's research involved several industry trade association membership directories, product databases, individual company Web sites, and marketing research tools (e.g., Dun and Bradstreet reports) to create a list of every company that manufactures or sells fluorescent lamp ballasts covered by this rulemaking. DOE reviewed all publicly-available data and contacted companies on its list, as necessary, to determine whether they met the SBA's definition of a small business manufacturer of covered fluorescent lamp ballasts. DOE screened out companies that did not offer fluorescent lamp ballasts covered by this rulemaking, did not meet the definition of a "small business," or are foreign owned and operated. Ultimately, DOE identified approximately 10 fluorescent lamp ballast manufacturers that produce covered fluorescent lamp ballasts and can potentially be considered small businesses out of the at least 54 ballast manufacturers identified in the fluorescent lamp ballast standards NOPR.

The final rule includes revisions to appendix Q and a new appendix Q1. The revisions to appendix Q update an industry reference and do not change the test method or increase testing burden. The only difference between the two test procedures relates to the interference of testing instrumentation. Specifically, the input power measurement of ANSI C82.2-2002 reduces the interference of instrumentation on the input power measurement as compared to ANSI C82.2-1984. The vast majority of companies and testing facilities, however, already employ modern instrumentation that does not significantly interfere with input power measurements. Thus, updating this industry reference would not impose additional financial burden in terms of labor or materials. As described in more detail in section III.D, the amended test procedure for appendix Q1 is generally less burdensome compared to the existing test procedure, while reducing measurement variation. This procedure uses only electrical measurements which are generally simpler and more quickly carried out than photometric

measurements. The final test procedure only uses a reference ballast once every 24 hours, rather than during the performance evaluation of each individual ballast. This change reduces the number of measurements necessary for assigning a BLE to a ballast compared to the number of measurements necessary for BEF under the existing test procedure. In addition, the final test method specifies a shorter lamp seasoning period (12 hours versus 100 hours) because the lamp's electrical characteristics stabilize sooner than its photometric characteristics.

To analyze the testing burden impacts described above on small business manufacturers, DOE first sought to examine publically available financial data for those companies identified as small businesses to compare the estimated revenue and profit of these businesses to the anticipated testing burden associated with this final test procedure. In the SNOPR, DOE determined that all the identified small business manufacturers were privately owned, and as a result, financial data was not publically available. DOE estimates that the incremental testing costs for an average small business would be no more and likely less than testing costs under the existing BEF test procedure for the reasons set forth in the following paragraph.

The BLE procedure requires no additional equipment compared to the existing test procedure and eliminates the usage of photocells or an integrating sphere. In addition, the existing BEF test procedure requires measurements of lamp light output on a reference ballast and measurements on a test ballast during each test. Light output measurements and electrical measurements of the reference system can require one to two hours depending on the number of reference ballasts available and the speed at which the lamp reaches photometric stability. Light output and electrical measurements of the test ballast are taken immediately after switching the lamps from the reference to the test system. In contrast, the BLE procedure in this final rule requires the reference lamps to be measured and stabilized on a reference ballast only once every twenty four hours. After this stabilization, subsequent testing of the ballasts of interest can take between 15 and 60 minutes. In the SNOPR, DOE estimated that between 4 and 8 ballast samples could be completed in an eight hour period using the existing BEF test procedure, while between 8 and 16 tests could be completed using the BLE test procedure. Therefore, DOE estimated the BLE procedure could result in an

incremental reduction in testing time of about 50%. Assuming the labor rate for carrying out either procedure is \$100 per hour, the BLE procedure could reduce testing costs by \$50 to \$100 dollars per test. DOE noted that depending on setup, some facilities may see less of a reduction in testing time or potentially no change in testing time. Finally, as presented in the SNOPR, DOE believes the cost of test laboratory accreditation is approximately \$8000 per year, which DOE believes would not be a significant impact.

On the basis of the foregoing, DOE concluded that this final rule would not have a significant impact on a substantial number of small entities. Accordingly, DOE has not prepared a regulatory flexibility analysis for this rulemaking. DOE has provided its certification and supporting statement of factual basis to the Chief Counsel for Advocacy of the Small Business Administration for review under 5 U.S.C. 605(b).

C. Review Under the Paperwork Reduction Act of 1995

Manufacturers of fluorescent lamp ballasts must certify to DOE that their product complies with any applicable energy conservation standard. In certifying compliance, manufacturers must test their product according to the DOE test procedure for fluorescent lamp ballasts, including any amendments adopted for that test procedure. DOE has proposed regulations for the certification and recordkeeping requirements for all covered consumer products and commercial equipment, including fluorescent lamp ballasts. 75 FR 56796 (Sept. 16, 2010). The collection-of-information requirement for the certification and recordkeeping has been approved by OMB under control number 1910-1400. As described in the NOPR, the public reporting burden for the certification is estimated to average 20 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Public comment is sought regarding: whether this proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information shall have practical utility; the accuracy of the burden estimate; ways to enhance the quality, utility, and clarity of the information to be collected; and ways to minimize the burden of the collection of information, including through the use of automated

collection techniques or other forms of information technology. Send comments on these or any other aspects of the collection of information to Tina Kaarsberg (see **ADDRESSES**) and by e-mail to *Christine J. Kymn@omb.eop.gov*.

Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the PRA, unless that collection of information displays a currently valid OMB Control Number.

D. Review Under the National Environmental Policy Act of 1969

In this final rule, DOE amends its test procedure for fluorescent lamp ballasts. DOE has determined that this rule falls into a class of actions that are categorically excluded from review under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*) and DOE's implementing regulations at 10 CFR part 1021. Specifically, this rule amends an existing rule without affecting the amount, quality or distribution of energy usage, and, therefore, will not result in any environmental impacts. Thus, this rulemaking is covered by Categorical Exclusion A5 under 10 CFR part 1021, subpart D, which applies to any rulemaking that interprets or amends an existing rule without changing the environmental effect of that rule. Accordingly, neither an environmental assessment nor an environmental impact statement is required.

E. Review Under Executive Order 13132

Executive Order 13132, "Federalism," 64 FR 43255 (August 4, 1999) imposes certain requirements on agencies formulating and implementing policies or regulations that preempt State law or that have Federalism implications. The Executive Order requires agencies to examine the constitutional and statutory authority supporting any action that would limit the policymaking discretion of the States and to carefully assess the necessity for such actions. The Executive Order also requires agencies to have an accountable process to ensure meaningful and timely input by State and local officials in the development of regulatory policies that have Federalism implications. On March 14, 2000, DOE published a statement of policy describing the intergovernmental consultation process it will follow in the development of such regulations. 65 FR 13735. DOE examined this final rule and determined that it will not have a substantial direct

effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. EPCA governs and prescribes Federal preemption of State regulations as to energy conservation for the products that are the subject of today's final rule. States can petition DOE for exemption from such preemption to the extent, and based on criteria, set forth in EPCA. (42 U.S.C. 6297(d)) No further action is required by Executive Order 13132.

F. Review Under Executive Order 12988

Regarding the review of existing regulations and the promulgation of new regulations, section 3(a) of Executive Order 12988, "Civil Justice Reform," 61 FR 4729 (Feb. 7, 1996), imposes on Federal agencies the general duty to adhere to the following requirements: (1) Eliminate drafting errors and ambiguity; (2) write regulations to minimize litigation; (3) provide a clear legal standard for affected conduct rather than a general standard; and (4) promote simplification and burden reduction. Section 3(b) of Executive Order 12988 specifically requires that Executive agencies make every reasonable effort to ensure that the regulation: (1) Clearly specifies the preemptive effect, if any; (2) clearly specifies any effect on existing Federal law or regulation; (3) provides a clear legal standard for affected conduct while promoting simplification and burden reduction; (4) specifies the retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3(c) of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in sections 3(a) and 3(b) to determine whether they are met or it is unreasonable to meet one or more of them. DOE has completed the required review and determined that, to the extent permitted by law, this final rule meets the relevant standards of Executive Order 12988.

G. Review Under the Unfunded Mandates Reform Act of 1995

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA) requires each Federal agency to assess the effects of Federal regulatory actions on State, local, and Tribal governments and the private sector. Public Law 104-4, sec. 201 (codified at 2 U.S.C. 1531). For a regulatory action resulting in a rule that may cause the expenditure by State, local, and Tribal governments, in the

aggregate, or by the private sector of \$100 million or more in any one year (adjusted annually for inflation), section 202 of UMRA requires a Federal agency to publish a written statement that estimates the resulting costs, benefits, and other effects on the national economy. (2 U.S.C. 1532(a), (b)) The UMRA also requires a Federal agency to develop an effective process to permit timely input by elected officers of State, local, and Tribal governments on a proposed "significant intergovernmental mandate," and requires an agency plan for giving notice and opportunity for timely input to potentially affected small governments before establishing any requirements that might significantly or uniquely affect small governments. On March 18, 1997, DOE published a statement of policy on its process for intergovernmental consultation under UMRA. 62 FR 12820; also available at <http://www.gc.doe.gov>. DOE examined today's final rule according to UMRA and its statement of policy and determined that the rule contains neither an intergovernmental mandate, nor a mandate that may result in the expenditure of \$100 million or more in any year, so these requirements do not apply.

H. Review Under the Treasury and General Government Appropriations Act, 1999

Section 654 of the Treasury and General Government Appropriations Act, 1999 (Pub. L. 105-277) requires Federal agencies to issue a Family Policymaking Assessment for any rule that may affect family well-being. Today's final rule will not have any impact on the autonomy or integrity of the family as an institution. Accordingly, DOE has concluded that it is not necessary to prepare a Family Policymaking Assessment.

I. Review Under Executive Order 12630

DOE has determined, under Executive Order 12630, "Governmental Actions and Interference with Constitutionally Protected Property Rights" 53 FR 8859 (March 18, 1988), that this regulation will not result in any takings that might require compensation under the Fifth Amendment to the U.S. Constitution.

J. Review Under Treasury and General Government Appropriations Act, 2001

Section 515 of the Treasury and General Government Appropriations Act, 2001 (44 U.S.C. 3516 note) provides for agencies to review most disseminations of information to the public under guidelines established by each agency pursuant to general

guidelines issued by OMB. OMB's guidelines were published at 67 FR 8452 (Feb. 22, 2002), and DOE's guidelines were published at 67 FR 62446 (Oct. 7, 2002). DOE has reviewed today's final rule under the OMB and DOE guidelines and has concluded that it is consistent with applicable policies in those guidelines.

K. Review Under Executive Order 13211

Executive Order 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," 66 FR 28355 (May 22, 2001), requires Federal agencies to prepare and submit to OMB, a Statement of Energy Effects for any significant energy action. A "significant energy action" is defined as any action by an agency that promulgated or is expected to lead to promulgation of a final rule, and that: (1) Is a significant regulatory action under Executive Order 12866, or any successor order; and (2) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (3) is designated by the Administrator of OIRA as a significant energy action. For any significant energy action, the agency must give a detailed statement of any adverse effects on energy supply, distribution, or use if the regulation is implemented, and of reasonable alternatives to the action and their expected benefits on energy supply, distribution, and use.

Today's regulatory action is not a significant regulatory action under Executive Order 12866. Moreover, it would not have a significant adverse effect on the supply, distribution, or use of energy, nor has it been designated as a significant energy action by the Administrator of OIRA. Therefore, it is not a significant energy action, and, accordingly, DOE has not prepared a Statement of Energy Effects.

L. Review Under Section 32 of the Federal Energy Administration Act of 1974

Under section 301 of the Department of Energy Organization Act (Pub. L. 95-91; 42 U.S.C. 7101), DOE must comply with section 32 of the Federal Energy Administration Act of 1974, as amended by the Federal Energy Administration Authorization Act of 1977. (15 U.S.C. 788; FEAA) Section 32 essentially provides in relevant part that, where a proposed rule authorizes or requires use of commercial standards, the notice of proposed rulemaking must inform the public of the use and background of such standards. In addition, section 32(c) requires DOE to consult with the Attorney General and the Chairman of the Federal Trade Commission (FTC)

concerning the impact of the commercial or industry standards on competition.

This final test procedure incorporates testing methods contained in the following commercial standards: ANSI C78.81-2010, Revision of ANSI C78.81-2005 ("ANSI C78.81-2010"), American National Standard for Electric Lamps—Double-Capped Fluorescent Lamps—Dimensional and Electrical Characteristics; ANSI C82.1-2004, Revision of ANSI C82.1-1997 ("ANSI C82.1"), American National Standard for Lamp Ballast—Line-Frequency Fluorescent Lamp Ballast; ANSI C82.2-2002, Revision of ANSI C82.2-1994 (R1995), American National Standard for Lamp Ballasts-Method of Measurement of Fluorescent Ballasts; ANSI C82.11-2002, Revision of ANSI C82.11-1993 ("ANSI C82.11"), American National Standard for Lamp Ballasts—High-frequency Fluorescent Lamp Ballasts; ANSI C82.13-2002 ("ANSI C82.13"), American National Standard for Lamp Ballasts—Definitions for Fluorescent Lamps and Ballasts; ANSI C78.375-1997, Revision of ANSI C78.375-1991 ("ANSI C78.375"), American National Standard for Fluorescent Lamps—Guide for Electrical Measurements, first edition; ANSI C82.3-2002, Revision of ANSI C82.3-1983 (R 1995) ("ANSI C82.3"), American National Standard for Reference Ballasts for Fluorescent Lamps. DOE has evaluated these standards and was unable to conclude whether they fully comply with the requirements of section 32(b) of the FEAA (*i.e.* whether it was developed in a manner that fully provides for public participation, comment, and review.) DOE has consulted with both the Attorney General and the Chairman of the FTC about the impact on competition of using the methods contained in these standards and has received no comments objecting to their use.

M. Congressional Notification

As required by 5 U.S.C. 801, DOE will report to Congress on the promulgation of today's rule before its effective date. The report will state that it has been determined that the rule is not a "major rule" as defined by 5 U.S.C. 804(2).

N. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of this final rule.

List of Subjects in 10 CFR Part 430

Administrative practice and procedure, Confidential business information, Energy conservation, Household appliances, Imports,

Incorporation by reference, Intergovernmental relations, Small businesses.

Issued in Washington, DC, on April 26, 2011.

Kathleen B. Hogan,

Deputy Assistant Secretary for Energy Efficiency, Office of Technology Development, Energy Efficiency and Renewable Energy.

For the reasons stated in the preamble, DOE amends part 430 of Chapter II of Title 10, Code of Federal Regulations as set forth below:

PART 430—ENERGY CONSERVATION PROGRAM FOR CONSUMER PRODUCTS

■ 1. The authority citation for part 430 continues to read as follows:

Authority: 42 U.S.C. 6291–6309; 28 U.S.C. 2461 note.

■ 2. Section 430.3 is amended by:

■ a. Redesignating paragraph (c)(13) as (c)(17); (c)(12) as (c)(13); (c)(11) as (c)(14); and paragraphs (c)(6) through (c)(10) as (c)(7) through (c)(11), respectively;

■ b. Removing in redesignated paragraphs (c)(7) and (c)(14) the words “Appendix R” and adding in their place “Appendix Q, Appendix Q1 and Appendix R”;

■ c. Revising redesignated paragraph (c)(13);

■ d. Adding new paragraphs (c)(6), (c)(12), (c)(15) and (c)(16) to read as set forth below;

■ e. Removing and reserving paragraph (d).

These revisions and additions read as follows:

§ 430. 3 Materials incorporated by reference.

* * * * *

(c) * * *

(6) ANSI IEC C78.81–2010 (“ANSI C78.81–2010”), American National Standard for Electric Lamps—Double-Capped Fluorescent Lamps—Dimensional and Electrical Characteristics, approved January 14, 2010; IBR approved for Appendix Q and Appendix Q1 to Subpart B.

* * * * *

(12) ANSI C82.1–2004, (“ANSI C82.1”), American National Standard for Lamp Ballast—Line Frequency Fluorescent Lamp Ballast, approved November 19, 2004; IBR approved for Appendix Q and Appendix Q1 to Subpart B.

(13) ANSI C82.2–2002, (“ANSI C82.2”), American National Standard for Lamp Ballasts—Method of Measurement of Fluorescent Ballasts, Approved June

6, 2002, IBR approved for Appendix Q and Appendix Q1 to Subpart B.

* * * * *

(15) ANSI C82.11 Consolidated-2002, (“ANSI C82.11”), American National Standard for Lamp Ballasts—High-frequency Fluorescent Lamp Ballasts—Supplements, approved March 11, 1999, August 5, 1999 and January 17, 2002; IBR approved for Appendix Q and Appendix Q1 to Subpart B.

(16) ANSI C82.13–2002 (“ANSI C82.13”), American National Standard for Lamp Ballasts—Definitions for Fluorescent Lamps and Ballasts, approved July 23, 2002; IBR approved for Appendix Q and Appendix Q1 to Subpart B.

* * * * *

(d) [Reserved]

* * * * *

■ 3. Section 430.23 is amended by revising paragraph (q) to read as follows:

§ 430.23 Test procedures for the measurement of energy and water consumption.

* * * * *

(q) *Fluorescent Lamp Ballasts.* (1) The Estimated Annual Energy Consumption (EAEC) for fluorescent lamp ballasts, expressed in kilowatt-hours per year, shall be the product of:

(i) The input power in kilowatts as determined in accordance with section 3.1.3.1 of appendix Q to this subpart; and

(ii) The representative average use cycle of 1,000 hours per year, the resulting product then being rounded off to the nearest kilowatt-hour per year.

(2) Ballast Efficacy Factor (BEF) shall be as determined in section 4.2 of appendix Q of this subpart.

(3) The Estimated Annual Operating Cost (EAOC) for fluorescent lamp ballasts, expressed in dollars per year, shall be the product of:

(i) The representative average unit energy cost of electricity in dollars per kilowatt-hour as provided by the Secretary,

(ii) The representative average use cycle of 1,000 hours per year, and

(iii) The input power in kilowatts as determined in accordance with section 3.1.3.1 of appendix Q to this subpart, the resulting product then being rounded off to the nearest dollar per year.

(4) Standby power consumption of certain fluorescent lamp ballasts shall be measured in accordance with section 3.2 of appendix Q to this subpart.

* * * * *

■ 4. Section 430.25 is revised to read as follows:

§ 430.25 Laboratory Accreditation Program.

Testing for fluorescent lamp ballasts performed in accordance with appendix Q1 to this subpart shall comply with this section § 430.25. The testing for general service fluorescent lamps, general service incandescent lamps, and incandescent reflector lamps shall be performed in accordance with appendix R to this subpart. The testing for medium base compact fluorescent lamps shall be performed in accordance with appendix W of this subpart. This testing shall be conducted by test laboratories accredited by the National Voluntary Laboratory Accreditation Program (NVLAP) or by an accrediting organization recognized by NVLAP. NVLAP is a program of the National Institute of Standards and Technology, U.S. Department of Commerce. NVLAP standards for accreditation of laboratories that test for compliance with standards for fluorescent lamp ballast luminous efficiency (BLE), lamp efficacy, and CRI are set forth in 15 CFR part 285. A manufacturer’s or importer’s own laboratory, if accredited, may conduct the applicable testing. Testing for BLE may also be conducted by laboratories accredited by Underwriters Laboratories or Council of Canada. Testing for fluorescent lamp ballasts performed in accordance with appendix Q to this subpart is not required to be conducted by test laboratories accredited by NVLAP or an accrediting organization recognized by NVLAP.

■ 5. Appendix Q to subpart B of part 430 is amended by:

■ a. Revising sections 1.15, 1.16, 1.17, and 2.

■ b. Redesignating sections 3.1, 3.2, 3.3, 3.3.1, 3.3.2, 3.3.3, 3.4, 3.4.1, and 3.4.2 as sections 3.1.1, 3.1.2, 3.1.3, 3.1.3.1, 3.1.3.2, 3.1.3.3, 3.1.4, 3.1.4.1, and 3.1.4.2, respectively.

■ c. Revising redesignated sections 3.1.1, 3.1.2, 3.1.3.1, 3.1.3.2, 3.1.3.3, 3.1.4.1, and 3.1.4.2.

■ d. Redesignating sections 3.5, 3.5.1, 3.5.2, 3.5.3, 3.5.3.1, 3.5.3.2, 3.5.3.3, and 3.5.3.4 as sections 3.2, 3.2.2, 3.2.3, 3.2.4, 3.2.4.1, 3.2.4.2, 3.2.4.3, and 3.2.4.4, respectively.

■ e. Adding sections 3.1 and 3.2.1.

■ f. Revising section 4.

These revisions and additions read as follows:

Appendix Q to Subpart B of Part 430—Uniform Test Method for Measuring the Energy Consumption of Fluorescent Lamp Ballasts

1. * * *

1.15 *Power Factor* means the power input divided by the product of ballast input

voltage and input current of a fluorescent lamp ballast, as measured under test conditions specified in ANSI C82.2 (incorporated by reference; see § 430.3).

1.16 *Power input* means the power consumption in watts of a ballast a fluorescent lamp or lamps, as determined in accordance with the test procedures specified in ANSI C82.2 (incorporated by reference; see § 430.3).

1.17 *Relative light output* means the light output delivered through the use of a ballast divided by the light output of a reference ballast, expressed as a percent, as determined in accordance with the test procedures specified in ANSI C82.2 (incorporated by reference; see § 430.3).

* * * * *

2. *Test Conditions.*

2.1 *Measurement of Active Mode Energy Consumption, BEF.* The test conditions for testing fluorescent lamp ballasts shall be done in accordance with ANSI C82.2 (incorporated by reference; see § 430.3). Any subsequent amendment to this standard by the standard setting organization will not affect the DOE test procedures unless and until amended by DOE. The test conditions for measuring active mode energy consumption are described in sections 4, 5, and 6 of ANSI C82.2. The test conditions described in this section (2.1) are applicable to section 3.1 of section 3, Test Method and Measurements. For section 2.1 and 3, when ANSI C82.2 is referenced, ANSI C78.81–2010 (incorporated by reference; see § 430.3), ANSI C82.1 (incorporated by reference; see § 430.3), ANSI C82.11 (incorporated by reference; see § 430.3), and ANSI C82.13 (incorporated by reference; see § 430.3) shall

be used instead of the versions listed as normative references in ANSI C82.2.

2.2 *Measurement of Standby Mode Power.* The measurement of standby mode power need not be performed to determine compliance with energy conservation standards for fluorescent lamp ballasts at this time. This and the previous statement will be removed as part of a rulemaking to amend the energy conservation standards for fluorescent lamp ballasts to account for standby mode energy consumption, and the following shall apply on the compliance date for any such requirements.

The test conditions for testing fluorescent lamp ballasts shall be done in accordance with ANSI C82.2 (incorporated by reference; see § 430.3). Any subsequent amendment to this standard by the standard setting organization will not affect the DOE test procedures unless and until amended by DOE. The test conditions for measuring standby power are described in sections 5, 7, and 8 of ANSI C82.2. Fluorescent lamp ballasts that are capable of connections to control devices shall be tested with all commercially available compatible control devices connected in all possible configurations. For each configuration, a separate measurement of standby power shall be made in accordance with section 3.2 of the test procedure.

3. * * *

3.1 *Active Mode Energy Efficiency Measurement*

3.1.1 The test method for testing the active mode energy efficiency of fluorescent lamp ballasts shall be done in accordance with ANSI C82.2 (incorporated by reference; see § 430.3). Where ANSI C82.2 references ANSI C82.1–1997, the operator shall use ANSI C82.1 (incorporated by reference; see

§ 430.3) for testing low-frequency ballasts and ANSI C82.11 (incorporated by reference; see § 430.3) for high-frequency ballasts.

3.1.2 *Instrumentation.* The instrumentation shall be as specified by sections 5, 7, 8, and 15 of ANSI C82.2 (incorporated by reference; see § 430.3).

3.1.3 * * *

3.1.3.1 *Input Power.* Measure the input power (watts) to the ballast in accordance with ANSI C82.2 (incorporated by reference; see § 430.3), section 4.

3.1.3.2 *Input Voltage.* Measure the input voltage (volts) (RMS) to the ballast in accordance with ANSI C82.2 (incorporated by reference; see § 430.3), section 3.2.1 and section 4.

3.1.3.3 *Input Current.* Measure the input current (amps) (RMS) to the ballast in accordance with ANSI C82.2 (incorporated by reference; see § 430.3), section 3.2.1 and section 4.

3.1.4 * * *

3.1.4.1 Measure the light output of the reference lamp with the reference ballast in accordance with ANSI C82.2 (incorporated by reference; see § 430.3), section 12.

3.1.4.2 Measure the light output of the reference lamp with the test ballast in accordance with ANSI C82.2 (incorporated by reference; see § 430.3), section 12.

3.2. * * *

3.2.1 The test for measuring standby mode energy consumption of fluorescent lamp ballasts shall be done in accordance with ANSI C82.2 (incorporated by reference; see § 430.3).

* * * * *

4. *Calculations.*

4.1 Calculate relative light output:

$$\text{relative light output} = \frac{\text{Photocell output of lamp on test ballast}}{\text{Photocell output of lamp on reference ballast}} \times 100$$

Where: photocell output of lamp on test ballast is determined in accordance with section 3.1.4.2, expressed in watts, and photocell output of lamp on ref. ballast is determined in accordance with section 3.1.4.1, expressed in watts.

4.2. Determine the Ballast Efficacy Factor (BEF) using the following equations:

(a) Single lamp ballast

$$BEF = \frac{\text{relative light output}}{\text{input power}}$$

(b) Multiple lamp ballast

$$BEF = \frac{\text{average relative light output}}{\text{input power}}$$

Where:

Input power is determined in accordance with section 3.1.3.1, relative light output as defined in section 4.1, and average relative light output is the relative light output, as defined in section 4.1, for all lamps, divided by the total number of lamps.

4.3 Determine Ballast Power Factor (PF):

$$PF = \frac{\text{Input power}}{\text{Input voltage} \times \text{input current}}$$

Where:

Input power is as defined in section 3.1.3.1,

Input voltage is determined in accordance with section 3.1.3.2,

expressed in volts, and Input current is determined in accordance with section 3.1.3.3, expressed in amps.

■ 6. Appendix Q1 is added to subpart B of part 430 to read as follows:

Appendix Q1 to Subpart B of Part 430—Uniform Test Method for Measuring the Energy Consumption of Fluorescent Lamp Ballasts

1. Definitions

1.1. *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.

1.2. *Active Mode* means the condition in which an energy-using product—

- (a) Is connected to a main power source;
- (b) Has been activated; and
- (c) Provides 1 or more main functions.

1.3. *Cathode heating* refers to power delivered to the lamp by the ballast for the purpose of raising the temperature of the lamp electrode or filament.

1.4. *Commercial ballast* is a fluorescent lamp ballast that is not a residential ballast as defined in section 1.13 and meets technical standards for non-consumer radio frequency lighting devices as specified in subpart C of 47 CFR part 18.

1.5. *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.

1.6. *High-frequency ballast* is as defined in ANSI C82.13 (incorporated by reference; see § 430.3).

1.7. *Instant-start* is the starting method used instant-start systems as defined in ANSI C82.13 (incorporated by reference; see § 430.3).

1.8. *Low-frequency ballast* is a fluorescent lamp ballast that operates at a supply

frequency of 50 to 60 Hz and operates the lamp at the same frequency as the supply.

1.9. *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.

1.10. *Programmed-start* is the starting method used in programmed-start systems as defined in ANSI C82.13 (incorporated by reference; see § 430.3).

1.11. *Rapid-start* is the starting method used in rapid-start type systems as defined in ANSI C82.13 (incorporated by reference; see § 430.3).

1.12. *Reference lamp* is a fluorescent lamp that meets certain operating conditions as defined by ANSI C82.13 (incorporated by reference; see § 430.3).

1.13. *Residential ballast* is a fluorescent lamp ballast designed and labeled for use in residential applications. Residential ballasts must meet the technical standards for consumer RF lighting devices as specified in subpart C of 47 CFR part 18.

1.14. *RMS* is the root mean square of a varying quantity.

1.15. *Standby mode* means the condition in which an energy-using product—

(a) Is connected to a main power source; and

(b) 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.

1.16. *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.

2. Active Mode Procedure

2.1. Where ANSI C82.2 (incorporated by reference; see § 430.3) references ANSI C82.1–1997, the operator shall use ANSI C82.1 (incorporated by reference; see § 430.3) for testing low-frequency ballasts and shall use ANSI C82.11 (incorporated by reference; see § 430.3) for high-frequency ballasts. In addition, when ANSI C82.2 is referenced, ANSI C78.81–2010 (incorporated by reference; see § 430.3), ANSI C82.1, ANSI C82.11–2002, and ANSI C82.13 (incorporated by reference; see § 430.3) shall be used instead of the versions listed as normative references in ANSI C82.2.

2.2. Instruments

2.2.1. All instruments shall be as specified by ANSI C82.2 (incorporated by reference; see § 430.3).

2.2.2. *Power Analyzer*. In addition to the specifications in ANSI C82.2 (incorporated by reference; see § 430.3), the power analyzer shall have a maximum 100 pF capacitance to ground and frequency response between 40 Hz and 1 MHz.

2.2.3. *Current Probe*. In addition to the specifications in ANSI C82.2 (incorporated by reference; see § 430.3), the current probe shall be galvanically isolated and have frequency response between 40 Hz and 20 MHz.

2.3. Test Setup

2.3.1. The ballast shall be connected to a main power source and to the fluorescent lamp load according to the manufacturer’s wiring instructions and ANSI C82.1 (incorporated by reference; see § 430.3) and ANSI C78.81–2010 (incorporated by reference; see § 430.3).

2.3.1.1.1. Wire lengths between the ballast and fluorescent lamp shall be the length provided by the ballast manufacturer. Wires

shall be kept loose and not shortened or bundled.

2.3.1.1.1.1. If the wire lengths supplied with the ballast are of insufficient length to reach both ends of lamp, additional wire may be added. The minimal additional wire length necessary shall be added, and the additional wire shall be the same wire gauge as the wire supplied with the ballast. If no wiring is provided with the ballast, 18 gauge or thicker wire shall be used. The wires shall be separated from each other and ground to prevent parasitic capacitance for all wires used in the apparatus, including those wires from the ballast to the lamps and from the lamps to the measuring devices.

2.3.1.1.2. The fluorescent lamp shall meet the specifications of a reference lamp as defined by ANSI C82.13 (incorporated by reference; see § 430.3) and be seasoned at least 12 hours.

2.3.1.2. The ballast shall be connected to the number of lamps equal to the maximum number of lamps the ballast is designed to operate.

2.3.1.3. The ballast shall be tested with a reference lamp of the nominal wattage listed in Table A of this section.

2.3.1.4. For ballasts that operate rapid-start lamps (commonly referred to as 8-foot high output lamps) with recessed double contact bases, a nominal overall length of 96 inches, and that operate at ambient temperatures of 20 °F or less and are used in outdoor signs (sign ballasts):

2.3.1.4.1. A T8 lamp in accordance with Table A of this section shall be used for sign ballasts that only operate T8 lamps.

2.3.1.4.2. A T12 lamp in accordance with Table A of this section shall be used for sign ballasts that only operate T12 lamps.

2.3.1.4.3. A T12 lamp in accordance with Table A of this section shall be used for sign ballasts that are capable of operating both T8 and T12 lamps.

TABLE A—LAMP-AND-BALLAST PAIRINGS AND FREQUENCY ADJUSTMENT FACTORS

Ballast type	Nominal lamp wattage	Lamp diameter and base	Frequency adjustment factor (β)	
			Low-frequency	High-frequency
Ballasts that operate straight-shaped lamps (commonly referred to as 4-foot medium bipin lamps) with medium bipin bases and a nominal overall length of 48 inches.	32	T8 MBP	0.94	1.0
	34	T12 MBP	0.93	1.0
Ballasts that operate U-shaped lamps (commonly referred to as 2-foot U-shaped lamps) with medium bipin bases and a nominal overall length between 22 and 25 inches.	32	T8 MBP	0.94	1.0
	34	T12 MBP	0.93	1.0
Ballasts that operate rapid-start lamps (commonly referred to as 8-foot-high output lamps) with recessed double contact bases and a nominal overall length of 96 inches.	86	T8 HO RDC	0.92	1.0
	95	T12 HO RDC	0.94	1.0
Ballasts that operate instant-start lamps (commonly referred to as 8-foot slimline lamps) with single pin bases and a nominal overall length of 96 inches.	59	T8 slimline SP	0.95	1.0
	60	T12 slimline SP	0.94	1.0
Ballasts that operate straight-shaped lamps (commonly referred to as 4-foot miniature bipin standard output lamps) with miniature bipin bases and a nominal length between 45 and 48 inches.	28	T5 SO Mini-BP	0.95	1.0
	54	T5 HO Mini-BP	0.95	1.0

TABLE A—LAMP-AND-BALLAST PAIRINGS AND FREQUENCY ADJUSTMENT FACTORS—Continued

Ballast type	Nominal lamp wattage	Lamp diameter and base	Frequency adjustment factor (β)	
			Low-frequency	High-frequency
Ballasts that operate rapid-start lamps (commonly referred to as 8-foot high output lamps) with recessed double contact bases, a nominal overall length of 96 inches, and that operate at ambient temperatures of 20 °F or less and are used in outdoor signs.	86	T8 HO RDC	0.92	1.0
	110	T12 HO RDC	0.94	1.0

MBP, Mini-BP, RDC, and SP represent medium bipin, miniature bipin, recessed double contact, and single pin, respectively.

2.3.2. Power Analyzer

2.3.2.1. The power analyzer shall have n+1 channels where n is the number of lamps a ballast operates.

2.3.2.2. *Lamp Arc Voltage.* Leads from the power analyzer should attach to each fluorescent lamp according to Figure 1 of this section for rapid- and programmed-start ballasts, Figure 2 of this section for instant-start ballasts operating single pin (SP) lamps, and Figure 3 of this section for instant-start

ballasts operating medium bipin (MBP), miniature bipin (mini-BP), or recessed double contact (RDC) lamps. The programmed- and rapid-start ballast test setup includes two 1000 ohm resistors placed in parallel with the lamp pins to create a midpoint from which to measure lamp arc voltage.

2.3.2.3. *Lamp Arc Current.* A current probe shall be positioned on each fluorescent lamp according to Figure 1 for rapid- and

programmed-start ballasts, Figure 2 of this section for instant-start ballasts operating SP lamps, and Figure 3 of this section for instant-start ballasts operating MBP, mini-BP, and RDC lamps.

2.3.2.3.1. For the lamp arc current measurement, the full transducer ratio shall be set in the power analyzer to match the current probe to the power analyzer.

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$$\text{Full Transducer Ratio} = \frac{I_{in}}{V_{out}} \times \frac{R_{in}}{R_{in} + R_s}$$

Where:

I_{in} Current through the current transducer
 V_{out} Voltage out of the transducer

R_{in} Power analyzer impedance
 R_s Current probe output impedance

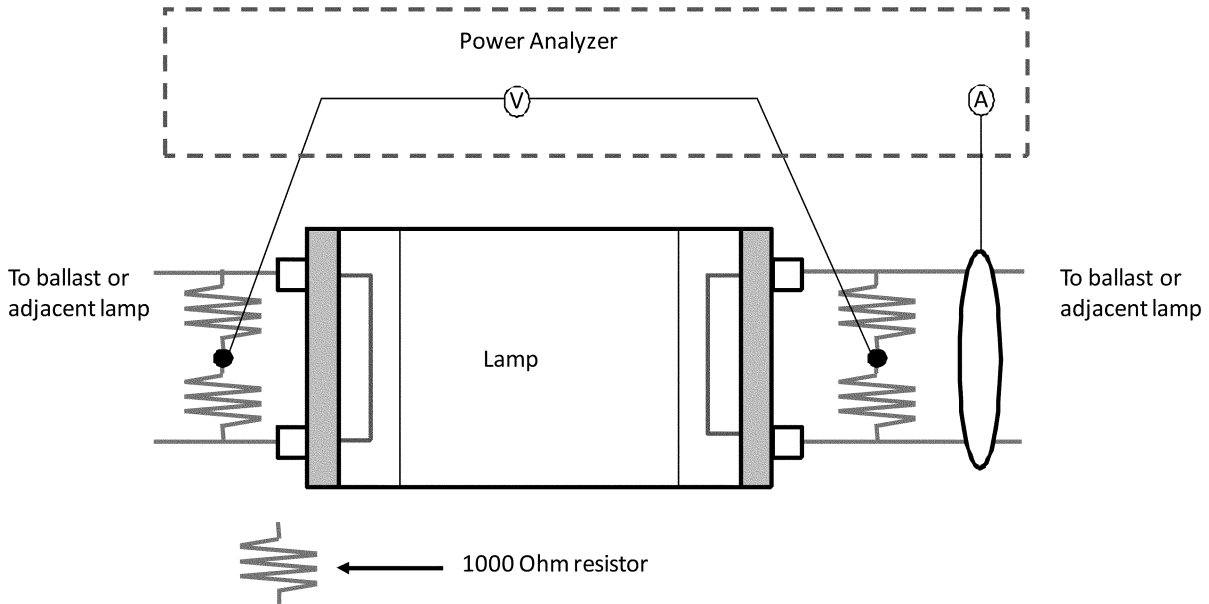


Figure 1: Programmed- and Rapid-Start Ballast Instrumentation Setup

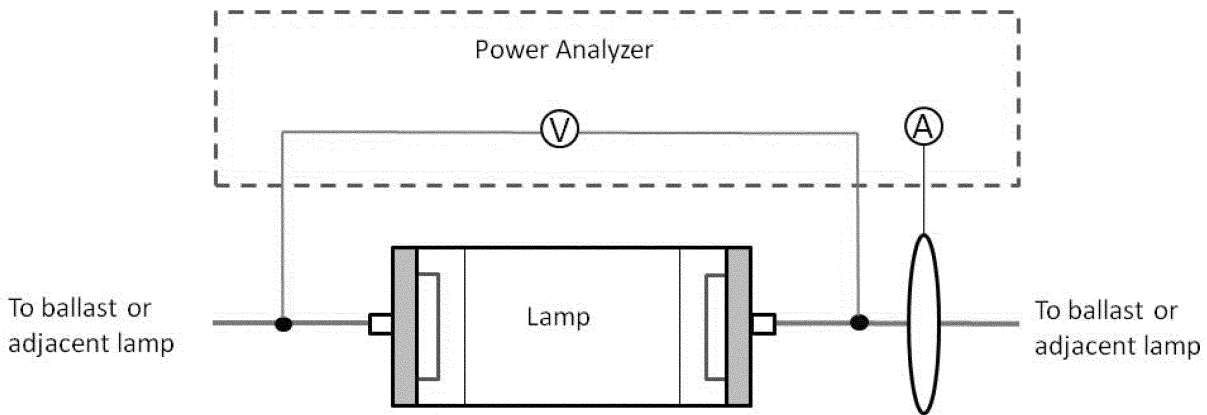


Figure 2: Instant-Start Ballasts that Operate SP Lamps Instrumentation Setup

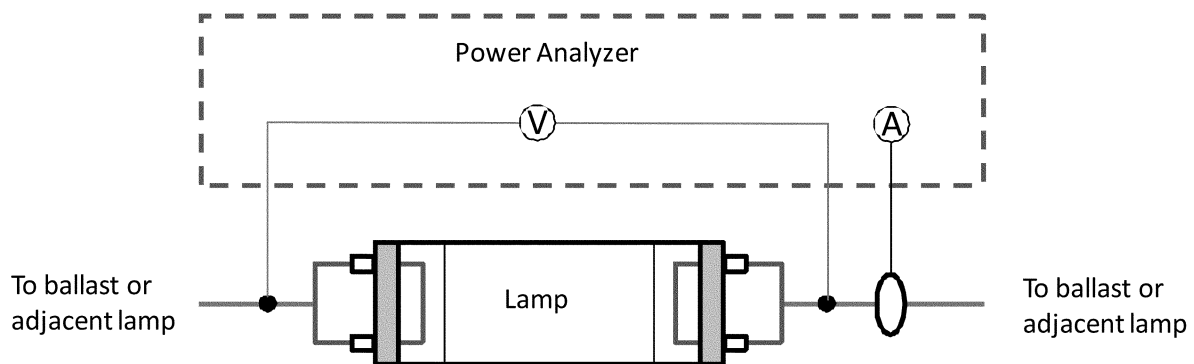


Figure 3: Instant-Start Ballasts that Operate MBP, mini-BP, and RDC Lamps Instrumentation Setup

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2.4. Test Conditions

2.4.1. The test conditions for testing fluorescent lamp ballasts shall be done in accordance with ANSI C82.2 (incorporated by reference; see § 430.3). DOE further specifies that the following revisions of the normative references indicated in ANSI C82.2 should be used in place of the references directly specified in ANSI C82.2: ANSI C78.81–2010 (incorporated by reference; see § 430.3), ANSI C82.1 (incorporated by reference; see § 430.3), ANSI C82.3 (incorporated by reference; see § 430.3), ANSI C82.11 (incorporated by reference; see § 430.3), and ANSI C82.13 (incorporated by reference; see § 430.3). All other normative references shall be as specified in ANSI C82.2.

2.4.2. *Room Temperature and Air Circulation.* The test facility shall be held at $25 \pm 2^\circ\text{C}$, with minimal air movement as defined in ANSI C78.375 (incorporated by reference; see § 430.3).

2.4.3. *Input Voltage.* The directions in ANSI C82.2 (incorporated by reference; see § 430.3) section 4.1 should be ignored with the following directions for input voltage used instead. For commercial ballasts capable of operating at multiple voltages, the ballast shall be tested $277\text{V} \pm 0.1\%$. For ballasts designed and labeled for residential

applications and capable of operating at multiple voltages, the ballast shall be tested at $120\text{V} \pm 0.1\%$. For ballasts designed and labeled as cold-temperature outdoor sign ballasts and capable of operating at multiple voltages, the ballast shall be tested at $120\text{V} \pm 0.1\%$. Ballasts capable of operating at only one input voltage shall be tested at that specified voltage.

2.5. Test Method

2.5.1. Ballast Luminous Efficiency.

2.5.1.1. The ballast shall be connected to the appropriate fluorescent lamps and to measurement instrumentation as indicated by the Test Setup in section 2.3.

2.5.1.2. The ballast shall be operated at full output for at least 15 minutes but no longer than 1 hour until stable operating conditions are reached. After this condition is reached, concurrently measure the parameters described in sections 2.5.1.3 through 2.5.1.9.

2.5.1.2.1. Stable operating conditions are determined by measuring lamp arc voltage, current, and power once per second in accordance with the setup described in section 2.3. Once the difference between the maximum and minimum values for lamp arc voltage, current, and power do not exceed one percent over a four minute moving window, the system shall be considered stable.

2.5.1.3. *Lamp Arc Voltage.* Measure lamp arc voltage (volts) using the setup described in section 2.3.2.2.

2.5.1.4. *Lamp Arc Current.* Measure lamp arc current (amps) using the setup described in section 2.3.2.3.

2.5.1.5. *Lamp Arc Power.* The power analyzer shall calculate output power by using the measurements described in sections 2.5.1.3 and 2.5.1.4.

2.5.1.6. *Input Power.* Measure the input power (watts) to the ballast in accordance with ANSI C82.2 (incorporated by reference; see § 430.3), section 7.

2.5.1.7. *Input Voltage.* Measure the input voltage (volts) (RMS) to the ballast in accordance with ANSI C82.2 (incorporated by reference; see § 430.3), section 3.2.1 and section 4.

2.5.1.8. *Input Current.* Measure the input current (amps) (RMS) to the ballast in accordance with ANSI C82.2 (incorporated by reference; see § 430.3), section 3.2.1 and section 4.

2.5.1.9. *Lamp Operating Frequency.* Measure the frequency of the waveform delivered from the ballast to any lamp in accordance with the setup in section 2.3.

2.6. Calculations

2.6.1. Calculate ballast luminous efficiency (BLE).

$$\text{Ballast Luminous Efficiency} = \frac{\text{Total Test Ballast Lamp Arc Power}}{\text{Ballast Input Power}} * \beta$$

Where: Total Lamp Arc Power is the sum of the lamp arc powers for all lamps operated by the ballast as determined by

section 2.5.1.5, ballast input power is as determined by section 2.5.1.6, and β is

equal to the frequency adjustment factor in Table A.
2.6.2. Calculate Power Factor (PF).

$$\text{Power Factor} = \frac{\text{Ballast Input Power} \times \text{Input Voltage}}{\text{Input Current}}$$

Where: Ballast input power is determined in accordance with section 2.5.1.6, input voltage is determined in accordance with section 2.5.1.7, and input current in determined in accordance with section 2.5.1.8.

3. Standby Mode Procedure

3.1. The measurement of standby mode power need not be performed to determine compliance with energy conservation standards for fluorescent lamp ballasts at this time. The above statement will be removed as part of a rulemaking to amend the energy conservation standards for fluorescent lamp ballasts to account for standby mode energy consumption, and the following shall apply on the compliance date for such requirements.

3.2. Test Conditions

3.2.1. The test conditions for testing fluorescent lamp ballasts shall be done in

accordance with the American National Standard Institute ANSI C82.2 (incorporated by reference; see § 430.3). Any subsequent amendment to this standard by the standard-setting organization will not affect the DOE test procedures unless and until amended by DOE. The test conditions for measuring standby power are described in sections 5, 7, and 8 of ANSI C82.2. Fluorescent lamp ballasts that are capable of connections to control devices shall be tested with all commercially available compatible control devices connected in all possible configurations. For each configuration, a separate measurement of standby power shall be made in accordance with section 3.3 of the test procedure.

3.3. Test Method and Measurements

3.3.1. The test for measuring standby mode energy consumption of fluorescent lamp ballasts shall be done in accordance with

ANSI C82.2 (incorporated by reference; see § 430.3).

3.3.2. 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.

3.3.3. *Input Power.* Measure the input power (watts) to the ballast in accordance with ANSI C82.2, section 13, (incorporated by reference; see § 430.3).

3.3.4. *Control Signal Power.* The power from the control signal path will be measured using all applicable methods described below.

3.3.4.1. *AC Control Signal.* Measure the AC control signal power (watts), using a wattmeter (W), connected to the ballast in accordance with the circuit shown in Figure 4 of this section.

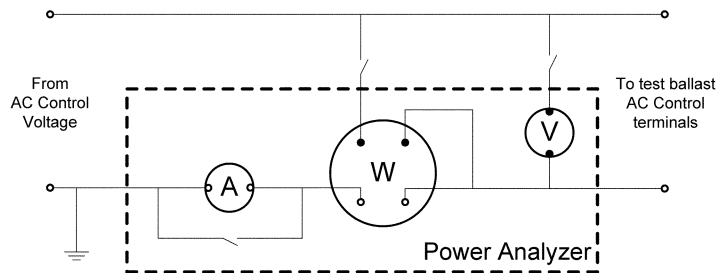


Figure 4: Circuit for Measuring AC Control Signal Power in Standby Mode

3.3.4.2. *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 5 of this section. The DC control signal power is calculated by

multiplying the DC control signal voltage and the DC control signal current.

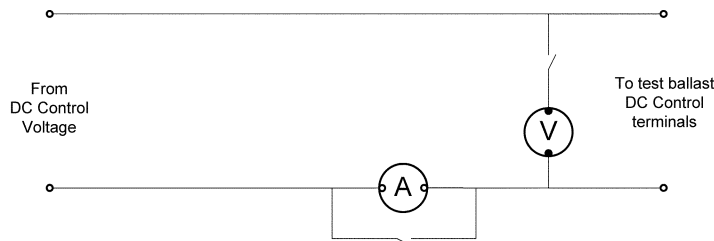


Figure 5: Circuit for Measuring DC Control Signal Power in Standby Mode

3.3.4.3. *Power Line Carrier (PLC) Control Signal.* Measure the PLC control signal power (watts), using a wattmeter (W), connected to the ballast in accordance with the circuit

shown in Figure 6 of this section. The wattmeter must have a frequency response that is at least 10 times higher than the PLC being measured in order to measure the PLC

signal correctly. The wattmeter must also be high-pass filtered to filter out power at 60 Hertz.

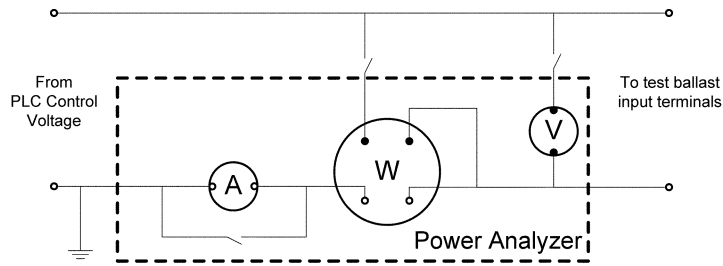


Figure 6: Circuit for Measuring PLC Control Signal Power in Standby Mode

3.3.4.4. *Wireless Control Signal.* The power supplied to a ballast using a wireless signal is not easily measured, but is estimated to be well below 1.0 watt. Therefore, the wireless control signal power is not measured as part of this test procedure.

[FR Doc. 2011-10704 Filed 5-3-11; 8:45 am]

BILLING CODE 6450-01-P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No. NM453; Special Conditions No. 25-425-SC]

Special Conditions: Gulfstream Aerospace LP (GALP) Model G250 Airplane, Dynamic Test Requirements for Side-Facing, Single-Occupant Seats

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for the Gulfstream Aerospace LP (GALP) model G250 airplane. This airplane will have a novel or unusual design feature associated with dynamic test requirements for side-facing, single-occupant seats. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: The effective date of these special conditions is March 18, 2011. We must receive your comments by June 20, 2011.

ADDRESSES: You must mail two copies of your comments to: Federal Aviation Administration, Transport Airplane Directorate, Attn: Rules Docket (ANM-113), Docket No. NM453, 1601 Lind Avenue SW., Renton, Washington 98057-3356. You may deliver two copies to the Transport Airplane Directorate at the above address. You must mark your comments: Docket No. NM453. You can inspect comments in the Rules Docket weekdays, except Federal holidays, between 7:30 a.m. and 4 p.m.

FOR FURTHER INFORMATION CONTACT: Dan Jacquet, FAA, Airframe/Cabin Safety Branch, ANM-115, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue, SW., Renton, Washington 98057-3356; telephone (425) 227-2676; facsimile (425) 227-1149; e-mail daniel.jacquet@faa.gov.

SUPPLEMENTARY INFORMATION:

The FAA has determined that notice of, and opportunity for prior public comment on, these special conditions are impracticable because these procedures would significantly delay issuance of the design approval and thus delivery of the affected aircraft. In addition, the substance of these special conditions has been subject to the public-comment process in several prior instances with no substantive comments received. The FAA therefore finds that good cause exists for making these special conditions effective upon issuance.

Comments Invited

We invite interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include

supporting data. We ask that you send us two copies of written comments.

We will file in the docket all comments we receive, as well as a report summarizing each substantive public contact with FAA personnel about these special conditions. You can inspect the docket before and after the comment closing date. If you wish to review the docket in person, go to the address in the **ADDRESSES** section of this preamble between 7:30 a.m. and 4 p.m., Monday through Friday, except Federal holidays.

We will consider all comments we receive by the closing date for comments. We may change these special conditions based on the comments we receive.

If you want us to acknowledge receipt of your comments on these special conditions, include with your comments a self-addressed, stamped postcard on which you have written the docket number. We will stamp the date on the postcard and mail it back to you.

Background

On March 30, 2006, GALP applied for a type certificate for their new Model G250. The Model G250 is an 8-10 passenger (19 maximum), twin-engine airplane with a 41,000-foot cruise altitude, maximum operating altitude of 45,000 feet, and a range of approximately 3,400 nautical miles. Airplane dimensions are 61.69-foot wing span, 66.6-foot overall length, and 20.8-foot tail height. Maximum takeoff weight is 39,600 pounds and maximum landing weight 32,700 pounds. Maximum cruise speed is mach 0.85, dive speed is mach 0.92. The avionics suite will be the Rockwell Collins Pro Line Fusion.

Type Certification Basis

Under the provisions of 14 CFR 21.17, GALP must show that the Model G250