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[6450-01-P]

DEPARTMENT OF ENERGY

10 CFR Parts 429 and 430

[EERE-2013-BT-TP-0050]

RIN 1904-AD88

Energy Conservation Program: Test Procedure for Ceiling Fans

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

ACTION: Notice of proposed rulemaking and request for comment.

SUMMARY: The U.S. Department of Energy (DOE) proposes to amend its test procedures for ceiling fans established under the Energy Policy and Conservation Act. On July 25, 2016, DOE published a final rule amending the test procedure for ceiling fans to support the ceiling fans energy conservation standards rulemaking. In this notice of proposed rulemaking (NOPR), DOE proposes to: interpret the term "suspended from a ceiling" in the EPCA definition of ceiling fan to mean offered for mounting only on a ceiling; specify that very small-diameter (VSD) ceiling fans that do not also meet the definition of low-speed small-diameter (LSSD) ceiling fan are not required to be tested pursuant to the DOE test method; for LSSD and VSD ceiling fans, increase the tolerance for the stability criteria for the average air velocity measurements in low speed to reduce test burden; specify that large-diameter ceiling with blade spans greater than 24 feet do not need to be tested pursuant to the DOE test method; codify current guidance on calculating several values reported on the U.S. Federal Trade Commission's (FTC) EnergyGuide label for LSSD and VSD ceiling fans using results from the ceiling fan test procedures; and amend certification requirements and product-specific enforcement

provisions to reflect the current test procedures and recently amended energy conservation standards for ceiling fans.

DATES: *Comments:* Written comments and information are requested and will be accepted on or before **[INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**. See section V, "Public Participation," for details.

Meeting: DOE will hold a public meeting on Wednesday, October 16, 2019 from 10:00 a.m. to 5:00 p.m.

ADDRESSES: *Meeting:* The public meeting will be held at the U.S. Department of Energy, Forrestal Building, Room 8E-089, 1000 Independence Avenue, SW., Washington, DC 20585. The meeting will also be broadcast as a webinar. See section V, "Public Participation," for webinar registration information, participant instructions, and information about the capabilities available to webinar participants.

Comments: Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at *http://www.regulations.gov*. Follow the instructions for submitting comments. Alternatively, interested persons may submit comments, identified by docket number EERE–2013–BT–TP-0050 or regulatory information number (RIN) 1904-AD88, by any of the following methods:

1) *Federal eRulemaking Portal*: *http://www.regulations.gov*. Follow the instructions for submitting comments.
2) *E-mail*: *CF2013TP0050@ee.doe.gov*. Include the docket number EERE–2013–BT–TP-0050 or regulatory information number (RIN) 1904-AD88 in the subject line of the message.

3) *Postal Mail*: Appliance and Equipment Standards Program, U.S. Department of Energy, Building Technologies Office, Mailstop EE-5B, 1000 Independence Avenue, SW., Washington, D.C., 20585-0121. Telephone: (202) 287-1445. If possible, please submit all items on a compact disc (CD), in which case it is not necessary to include printed copies.

4) *Hand Delivery/Courier*: Appliance and Equipment Standards Program, U.S. Department of Energy, Building Technologies Office, 950 L'Enfant Plaza, SW., Suite 600, Washington, D.C., 20024. Telephone: (202)-287-1445. If possible, please submit all items on a CD, in which case it is not necessary to include printed copies.

No telefacsimilies (faxes) will be accepted. For detailed instructions on submitting comments and additional information on the rulemaking process, see section V of this document (Public Participation).

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

The docket web page can be found at *http://www.regulations.gov/#!docketDetail;D=EERE-2013-BT-TP-0050*. The docket web page contains simple instructions on how to access all documents, including public

comments, in the docket. See section V for information on how to submit comments through *http://www.regulations.gov*.

FOR FURTHER INFORMATION CONTACT:

Ms. Lucy deButts, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office, EE-5B, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 287-1604. E-mail: *ApplianceStandardsQuestions@ee.doe.gov*.

Ms. Elizabeth Kohl, U.S. Department of Energy, Office of the General Counsel, GC-33, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 586-7796. E-mail: *elizabeth.kohl@hq.doe.gov*.

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

SUPPLEMENTARY INFORMATION:

DOE proposes to incorporate by reference the following industry standard into 10 CFR part 430:

ANSI/AMCA Standard 230-15 ("AMCA 230-15"), "Laboratory Methods of Testing Air Circulating Fans for Rating and Certification," ANSI approved October 16, 2015.

A copy of this standard is available from Air Movement and Control Association International, Inc. (AMCA), 30 West University Drive, Arlington Heights, IL 60004, (847) 394-0150, or by going to *http://www.amca.org/store/item.aspx?ItemId=81*.

For a further discussion of this standard, see section IV.N.

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I. Authority and Background

DOE is authorized to establish and amend energy conservation standards and test procedures for ceiling fans. (42 U.S.C. 6293(b)(16)(A)(i) and (B), and 6295(ff)) DOE's energy conservation standards and test procedures for ceiling fans are currently prescribed at 10 CFR 430.32(s)(1) and (2), and 10 CFR 430.23(w), respectively. The following sections discuss DOE's authority to establish test procedures for ceiling fans and relevant background information regarding DOE's consideration of test procedures for this product.

A. Authority

The Energy Policy and Conservation Act of 1975, as amended ("EPCA"),[1] among other things, authorizes DOE to regulate the energy efficiency of a number of consumer products and certain industrial equipment. (42 U.S.C. 6291-6317) Title III, Part B[2] of EPCA established the Energy Conservation Program for Consumer Products Other Than Automobiles, which sets forth a variety of provisions designed to improve energy efficiency. These consumer products include ceiling fans, the subject of this document. (42 U.S.C. 6291(49), 6293(b)(16)(A)(i) and (B), and 6295(ff))

Under EPCA, DOE's energy conservation program consists essentially of four parts: (1) testing, (2) labeling, (3) Federal energy conservation standards, and (4) certification and enforcement procedures. Relevant provisions of EPCA include definitions (42 U.S.C. 6291), energy conservation standards (42 U.S.C. 6295), test

[1] All references to EPCA in this document refer to the statute as amended through America's Water Infrastructure Act of 2018, Public Law 115–270 (October 23, 2018).
[2] For editorial reasons, upon codification in the U.S. Code, Part B was redesignated Part A.

procedures (42 U.S.C. 6293), labeling provisions (42 U.S.C. 6294), and the authority to require information and reports from manufacturers (42 U.S.C. 6296).

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

Federal energy efficiency requirements for covered products established under EPCA generally supersede State laws and regulations concerning energy conservation testing, labeling, and standards. (See 42 U.S.C. 6297) DOE may, however, grant waivers of Federal preemption for particular State laws or regulations, in accordance with the procedures and other provisions of EPCA. (42 U.S.C. 6316(b)(2)(D))

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 must 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, and not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3))

In addition, EPCA requires that DOE amend its test procedures for all covered products to integrate measures of standby mode and off mode energy consumption. (42 U.S.C. 6295(gg)(2)(A)) Standby mode and off mode energy consumption must be

incorporated into the overall energy efficiency, energy consumption, or other energy descriptor for each covered product unless the current test procedures already account for and incorporate standby and off mode energy consumption or such integration is technically infeasible. If an integrated test procedure is technically infeasible, DOE must prescribe a separate standby mode and off mode energy use test procedure for the covered product, if technically feasible. (U.S.C. 6295(gg)(2)(A)(ii)) Any such amendment must consider the most current versions of the International Electrotechnical Commission (IEC) Standard 62301[3] and IEC Standard 62087[4] as applicable. (42 U.S.C. 6295(gg)(2)(A))

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)) EPCA also requires that, at least once every 7 years, DOE review test procedures for each type of covered product, including ceiling fans, to determine whether amended test procedures would more accurately or fully comply with the requirements for the test procedures to not be unduly burdensome to conduct and be reasonably designed to produce test results that reflect energy efficiency, energy use, and estimated operating costs during a representative average use cycle or period of use. (42 U.S.C. 6293(b)(1)(A)) If the Secretary determines, on his own behalf or in response to a petition by any interested person, that a test procedure should be prescribed or amended, the Secretary shall promptly publish in the *Federal Register* proposed test procedures and afford interested persons an opportunity to present oral and

[3] IEC 62301, *Household electrical appliances—Measurement of standby power* (Edition 2.0, 2011-01).
[4] IEC 62087, *Methods of measurement for the power consumption of audio, video, and related equipment* (Edition 3.0, 2011-04).

written data, views, and arguments with respect to such procedures. The comment period on a proposed rule to amend a test procedure shall be at least 60 days and may not exceed 270 days. In prescribing or amending a test procedure, the Secretary shall take into account such information as the Secretary determines relevant to such procedure, including technological developments relating to energy use or energy efficiency of the type (or class) of covered products involved. (42 U.S.C. 6293(b)(2)) If DOE determines that test procedure revisions are not appropriate, DOE must publish notice in *Federal Register* of its determination not to amend the test procedure. (42 U.S.C. 6293(b)(1)(A))

B. Background

DOE's existing test procedures for ceiling fans appear at 10 CFR part 430, subpart B, appendix U, Uniform Test Method for Measuring the Energy Consumption of Ceiling Fans (hereafter "Appendix U").

DOE published a final rule in the *Federal Register* on July 25, 2016 (hereafter the "July 2016 CF TP final rule"), which amended test procedures for ceiling fans in Appendix U. 81 FR 48620. In this document, DOE proposes amendments to the test procedure based generally on questions received from interested parties.

DOE has initially determined that amendments to the ceiling fan test procedure are warranted and is issuing this notice of proposed rulemaking (NOPR) pursuant to 42 U.S.C. 6293(b)(2). DOE is also proposing these amendments in satisfaction of the 7-year review required under 42 U.S.C. 6203(b)(1)(A).

II. Synopsis of the Notice of Proposed Rulemaking

In this NOPR, DOE proposes: (1) to interpret the EPCA definition of ceiling fan to mean those fans offered for mounting only on a ceiling. Any fan, including a ceiling-

mount air circulating fan head, offered with other mounting options would not be a ceiling fan under this proposal. DOE also seeks comment on a proposed alternative interpretation. DOE is retaining the exemption for ceiling; fans for which the plane of rotation of the blades is greater than 45 degrees from horizontal, and for which the plane of rotation cannot be adjusted based on the manufacturer's specifications to be less than or equal to 45 degrees from horizontal. These fans are not subject to the test procedure and energy conservation standards established by DOE, but would remain subject to the design requirements of EPCA (2) to specify that VSD ceiling fans that do not also meet the definition of LSSD fan are not required to be tested pursuant to the DOE test method for purposes of demonstrating compliance with DOE's energy conservation standards for ceiling fans or representations of efficiency; (3) for LSSD and VSD ceiling fans, to increase the tolerance for the stability criteria for the average air velocity measurements at low-speed; (4) to codify in regulation existing guidance on the method for calculating several values reported on the Federal Trade Commission (FTC) EnergyGuide label for LSSD and VSD ceiling fans using results from the ceiling fan test procedures in Appendix U to subpart B of 10 CFR part 430 and represented values in 10 CFR part 429; (5) to specify that large-diameter ceiling with blade spans greater than 24 feet do not need to be tested pursuant to the DOE test procedure for purposes of demonstrating compliance with DOE energy conservation standards or representations of energy efficiency are; and (6) to amend certification requirements and product-specific enforcement provisions for ceiling fans to reflect the most recent amendments to the test procedures and energy conservation standards for ceiling fans. Any amended test procedure adopted in this rulemaking will be effective beginning 30 days after

publication of a final rule in the *Federal Register*. Representations of energy use or energy efficiency must be based on testing in accordance with this rulemaking, if adopted, beginning 180 days after the publication of a test procedure final rule.

The amendments proposed in this document would provide manufacturers additional certainty in the test procedures and labeling requirements for ceiling fans, and would reduce the testing burden related to the stability criteria. The proposed amendments with regard to air circulating fan heads would clarify the scope of DOE's authority to regulate ceiling fans as defined by EPCA, which does not include air circulating fan heads that do not meet the EPCA definition of a ceiling fan. The proposed amendments would specify that VSD ceiling fans that do not also meet the definition of LSSD fan are not required to be tested pursuant to the DOE test method for purposes of demonstrating compliance with DOE's energy conservation standards for ceiling fans or representations of efficiency, so these costs would not accrue to manufacturers of these VSD fans. As discussed in more detail in section III.C of this NOPR, the proposed increase in the tolerance for the stability criteria for the average air velocity measurements for LSSD and VSD ceiling fans at low speed is expected to reduce the test burden without changing test procedure results. The proposed codification of existing guidance is expected to provide manufacturers greater certainty in determining how to calculate certain values required to be reported on the FTC EnergyGuide label for LSSD and VSD ceiling fans. The estimated cost to test commercially-available large-diameter fans is approximately $4,000 per ceiling fan, but these costs would not accrue for manufacturers of any fans greater than 24 feet in diameter. The proposed amendments to the certification requirements would reflect the current test procedure and recently

amended energy conservation standards for ceiling fans. Finally, the proposed amendments to the product-specific enforcement provisions would specify the use of the methods currently in Appendix U for verifying certain ceiling fan characteristics (*i.e.*, blade span, distance between the ceiling and the lowest point of fan blades, blade revolutions per minute, and blade edge thickness).

Additionally, as discussed in more detail in section III of this NOPR, DOE has initially concluded that the amendments being proposed will not impact representations of ceiling fan efficiency made in accordance with the July 2016 CF TP final rule. Thus, retesting should not be required solely as a result of DOE's adoption of the proposed amendments to the test procedures. DOE emphasizes, however, that manufacturers are responsible for the validity of their representations and seeks comment on the initial conclusion that the proposal will not impact representations made according to the July 2016 CF TP final rule and that manufacturers therefore should not be required to retest their products if DOE adopts the proposed rule.

Table II.1 Summary of Changes in Proposed Test Procedure Relative to Current Test Procedure

Current DOE Test Procedure	Proposed Test Procedure	Attribution
Provides exceptions to the test procedure and energy conservation standards for ceiling fans where the plane of rotation of a ceiling fan's blades is not less than or equal to 45 degrees from horizontal, or cannot be adjusted based on the manufacturer's specifications to be less than or equal to 45 degrees from horizontal.	Interprets the EPCA definition of ceiling fan to mean those fans offered for mounting only on a ceiling and seeks comment on a proposed alternative interpretation. Retains the exceptions to the test procedure and energy conservation standards for ceiling fans that can be suspended from the ceiling, for which the plane of rotation of the ceiling fan's blades is greater than 45 degrees from horizontal, and for which the plane of rotation cannot be adjusted based on the manufacturer's specifications to be less than or equal to 45 degrees from horizontal.	Response to questions from industry, clarification.
Provides a method of testing only those VSD ceiling fans that meet	Specifies that VSD ceiling fans that are not also LSSD ceiling fans are not	Clarification

the LSSD ceiling fan definition.	required to be tested pursuant to the DOE test method.	
The tolerance for the stability criteria for the average air velocity measurements for LSSD and VSD ceiling fans at low speed is less than five (5) percent.	Increases the tolerance for the stability criteria for the average air velocity measurements for LSSD and VSD ceiling fans at low speed to less than ten (10) percent.	Response to waiver
Instruction on calculating EnergyGuide Label values based on measurements taken in accordance with Appendix U is provided in a guidance document separate from the CFR.	Codifies the calculation instructions in the CFR.	Ease of use.
Includes certification requirements and product-specific enforcement provisions.	Add provisions for verification of represented values to be used in the context of enforcement of the relevant efficiency standards.	Improve reproducibility and repeatability.

DOE seeks comment on the changes proposed in this document and on whether other amendments to the test procedure should be considered.

III. Discussion

A. Scope of Applicability

EPCA defines a "ceiling fan" as "a nonportable device that is suspended from a ceiling for circulating air via the rotation of fan blades." (42 U.S.C. 6291(49)) In the July 2016 CF TP final rule, DOE stated that the test procedure applies to any product meeting this definition, including hugger fans, fans designed for applications where large airflow volume may be needed, and highly decorative fans. DOE stated, however, that manufacturers were not required to test the following fans according to the test procedure: belt-driven ceiling fans, centrifugal ceiling fans, oscillating ceiling fans, and ceiling fans whose blades' plane of rotation cannot be within 45 degrees of horizontal. In this rulemaking, DOE is confirming the scope of its authority pursuant to EPCA to

regulate ceiling fans and confirming that its authority in this context is limited to fans that meet the EPCA definition of a ceiling fan. Specifically, DOE interprets the EPCA definition of ceiling fan to mean those fans offered for mounting only on a ceiling. Any ceiling-mount air circulating fan head or other fan that was offered with other mounting options would not be a ceiling fan for purposes of EPCA. DOE also seeks comment on alternative means to differentiate ceiling fans from air circulating fan heads that do not meet the EPCA definition of ceiling fan, as described in this section.

DOE received inquiries since the publication of the July 2016 CF TP final rule whether certain air circulating fan heads[5] would be subject to the DOE test procedures and energy conservation standards. These inquiries indicate that the procedure specified in the July 2016 CF TP final rule, in which testing was not required for ceiling fans whose blades' plane of rotation cannot be within 45 degrees of horizontal" [6], could potentially result in some air circulating fan heads that do not meet the EPCA definition of a ceiling fan being classified as ceiling fans subject to testing and compliance with DOE energy conservation standards. This includes air circulating fan heads that may, in addition to any other number of configurations, also be mounted on a downrod.

On May 31 and July 9, 2019, the Air Movement and Control Association (AMCA) submitted letters regarding air circulating fan heads.[7] AMCA stated that air

[5] Section 5.1.1 of ANSI/AMCA Standard 230-15 ("AMCA 230-15"), "Laboratory Methods of Testing Air Circulating Fans for Rating and Certification," defines *air circulating fan head* as an assembly consisting of a motor, impeller and guard for mounting on a pedestal having a base and column, wall mount bracket, ceiling mount bracket, I-beam bracket or other commonly accepted mounting means.
[6] If the plane of rotation of a ceiling fan's blades is not less than or equal to 45 degrees from horizontal, or cannot be adjusted based on the manufacturer's specifications to be less than or equal to 45 degrees from horizontal, the ceiling fan is not subject to the DOE test procedure and is not subject to the energy conservation standards. Section 2(1) of Appendix U; 10 CFR 430.36(s)(2)(ii)(A).
[7] AMCA's May 31 and July 9, 2019 letters to DOE can be accessed in the Docket here: *https://www.regulations.gov/document?D=EERE-2013-BT-TP-0050-0023.*

circulating fan heads have distinct characteristics and functions compared to traditional ceiling fans. Specifically, AMCA stated that air circulating fan heads are typically caged/housed and incorporated in products that are primarily offered for sale as floor mounted (portable pedestal) or mounted to vertical structures (wall mount), and are designed to provide concentrated directional airflow.

AMCA also noted that air circulating fan heads do not circulate air like a ceiling fan. Specifically, a ceiling fan will discharge air in the downward direction and the discharge air typically returns to the intake side of the fan with significant momentum, thus creating air circulation. Each pass through the fan increases the average air speed in the space until a steady state circulation of air is achieved. This air circulation pattern is why ceiling fan test procedures require a significant amount of time between activation of the ceiling fan and the measurement of performance data. In contract, air circulating fan heads provide directional, concentrated high speed airflow targeted at a specific location. The airflow from the air circulating fan head is unlikely to return to the intake side of the fan head with any significant moment and in many cases the discharge air may not return at all; therefore, a circulating pattern is not achieved.

In addition, AMCA stated that air circulating fan heads typically operate at faster speeds (tip speeds) than ceiling fans to produce air that will travel faster and farther for a given fan diameter. Accordingly, AMCA proposed in their letter that DOE clarify the interpretation that air circulating fan heads are not ceiling fans because they have other primary mounting options and operating modes where the fan is not required to be fixed to the ceiling, and additionally provide that the fan head's blade tip speed is greater than

5500 feet per minute (fpm).[8] AMCA also stated that air circulating fan heads have higher average outlet air speeds (calculated as the volumetric airflow rate (cfm) of the fan at high speed divided by the swept area of the blades (discharge area)) than ceiling fans and recommended a break point of 900 feet per minute as another distinguishing characteristic for large diameter ceiling fans and high speed small diameter ceiling fans.

As stated, EPCA defines "ceiling fan" as "a nonportable device that is suspended from a ceiling for circulating air via the rotation of fan blades." (42 U.S.C. 6291(49)) In DOE's view, because the EPCA definition of ceiling fan includes the terms "nonportable" and "suspended from a ceiling," it does not include within its scope any device offered for mounting on any surface other than a ceiling, even if it is also offered for mounting on a ceiling. Therefore, as a clarifying interpretation of EPCA's definition of "ceiling fan," DOE proposes to adopt a definition of ceiling fan in 10 CFR 430.2 whose scope would be limited to devices that are offered for mounting only on a ceiling. Any fan, including a ceiling-mount air circulating fan head, offered with other mounting options would not be a ceiling fan for purposes of EPCA.

This interpretation is based a reasoned understanding of the plain meaning of the text of the definition, taking into account the context of the statute as a whole. Specifically, the phrase "suspended from the ceiling for circulating air," is a clear description of the use of a "ceiling fan," i.e., where it is installed and for what purpose. It follows, then, that a device that is *not* offered for mounting on a ceiling is not within the scope of this definition.

[8] Tip speed is calculated as blade diameter x 3.14159 x rotational speed in revolutions per minute (RPM). The tip speed value was based on Table 90.1 from Underwriters Laboratory (UL) ceiling fan safety standard (UL Standard 507-2017, "Standard for Electric Fans").

Moreover, to be within the scope of the "ceiling fan" definition, the device must be "nonportable." An overly strict construction of this term would apply only to devices that, literally, *cannot* be moved. Within the context of DOE's understanding of the range of products offered for the purpose of circulating air (i.e., "fans") that can be suspended from a ceiling, a reasonable construction of the term "nonportable" would be devices that are not offered for mounting on a surface other than a ceiling, i.e., devices offered for mounting *only* on a ceiling. This would exclude as "portable" products offered with the option to be used in multiple locations over time, such as on a wall or floor, even if one of those options includes mounting the product to a ceiling.

DOE therefore concludes that EPCA's definition of "ceiling fan," by its plain meaning, does not include within its scope any device that is offered for mounting on a surface other than a ceiling, even if it is also offered for mounting on a ceiling. In addition, any ceiling-mount air circulating fan head that did not meet this criterion (i.e., offered with other mounting options) would not be a ceiling fan for purposes of EPCA. DOE would make clear this interpretation of the statutory definition of "ceiling fan" by adopting the following definition in DOE regulations at 10 CFR 430.2: "Ceiling fan means a nonportable device that is suspended from a ceiling for circulating air via the rotation of fan blades. For purposes of this definition, the term "suspended from a ceiling" means offered for mounting on a ceiling, and the term "nonportable" means not offered for mounting on a surface other than a ceiling."

DOE also seeks comment on an alternative proposal to differentiate air circulating fan heads or other fans that do not meet the EPCA definition of a ceiling fan. Any air circulating fan head or other fan that does not meet any one of the criteria specified in the

EPCA definition ("nonportable", "suspended from a ceiling", and "for circulating air via the rotation of fan blades") is not a ceiling fan for purposes of EPCA. DOE proposes to interpret the elements of the statutory definition of ceiling fan in the following way:

1) Portable – Meaning, the fan is offered for mounting on surfaces other than or in addition to the ceiling, including the ceiling mount version of such fans. In contrast, a ceiling fan is only mounted to the ceiling and would typically not perform properly if mounted in any other configuration. DOE also notes that once a ceiling fan is mounted to the ceiling, it is often hard-wired in place, which DOE understands is not always the case for air circulating fan heads[9];
2) Not suspended from the ceiling – This criterion is determined with reference to the point of manufacture, because DOE regulates manufacturers under EPCA. Air circulating fan heads or other fans that are not manufactured with a means to be suspended from the ceiling would not meet the statutory definition. With reference to air circulating fan heads, in many cases, the manufacturer produces the air circulating fan head, and the customer supplies the pipe or other means of suspension. Brackets may be supplied for mounting, but the customer decides where and how to mount the air circulating fan head (i.e., to the wall, ceiling, or some other appropriate location). In contrast a ceiling fan is meant only to be suspended from the ceiling and is not designed to be mounted in any other way.

[9] One manufacturer provided information on some air circulating fan heads that are not typically hardwired: three phase units since there is no truly standardized cord, and hazardous location ('explosion proof') units where by code they need to have specific wiring that does not allow for a standard cord. While some of these may be supplied with a cord by the customer, in some cases the customer may decide to hard wire them.

3) Not for the purpose of circulating air – As noted previously, AMCA stated in its July 9 letter, which was specific to air circulating fan heads, that air circulating fan heads do not circulate air like a ceiling fan. Specifically, a ceiling fan will discharge air in the downward direction and the discharge air typically returns to the intake side of the fan with significant momentum, thus creating air circulation. Each pass through the fan increases the average air speed in the space until a steady state circulation of air is achieved. This is not the case with air circulating fan heads, which provide directional, concentrated high speed airflow targeted at a specific location. The airflow from the air circulating fan head is unlikely to return to the intake side of the fan head with any significant momentum and in many cases the discharge air may not return at all; therefore, a circulating pattern is not achieved.

Given the above, DOE alternatively proposes to specify the following in DOE regulations at 10 CFR 430.2: "Ceiling fan means a nonportable device that is suspended from a ceiling for circulating air via the rotation of fan blades. DOE interprets this term to mean that any fan, including those meeting the definition of an "air circulating fan head" in AMCA 230-2015, that does not have a ceiling mount option, or that has more than one mounting option (even if one of the mounting options is a ceiling mount), is not a ceiling fan. Such fans do not meet the statutory criteria of being "nonportable", "suspended from the ceiling", and "for the purpose of circulating air." " Pursuant to the definition of "air circulating fan head" in AMCA 230-15, an air circulating fan head is intended for mounting by a number of means, which can include ceiling mount along with other types of mounts, such a pedestal, wall or I-beam bracket.

In making these proposals, DOE notes that the design standards of EPCA applicable to ceiling fans do not appear to be generally applicable to air circulating fan heads that do not meet the criteria of the statutory definition. Specifically, EPCA requires all ceiling fans manufactured after January 1, 2007, to have: (i) Fan speed controls separate from any lighting controls; (ii) Adjustable speed controls (either more than 1 speed or variable speed); and (iii) The capability of reversible fan action. (42 U.S.C. 6295(ff)(1)(A). DOE is not aware of any air circulating fan head designs where the fan speed and lighting controls are not separate. Most air circulating fan heads are not designed with more than 1 speed because it would be prohibitively expensive, especially for explosion proof air circulating fan heads, for example. And, because air circulating fan heads are meant to provide directed air flow, the necessity for reverse action is not applicable or relevant, because the fan can simply be moved or redirected. As a result, it makes sense that air circulating fan heads to which these criteria do not apply would not be considered ceiling fans for purposes of EPCA.[10] Applying the design standards of EPCA to those fans, including air circulating fan heads that do not meet the DOE definition for ceiling fan is not appropriate. Air circulating fan heads could, however, be

[10] DOE received information from a manufacturer supporting this assertion. Specifically, the manufacturer did not know of no air circulating fan heads that are provided with lighting as an integral part of the fan head. The only application of which the manufacturer was aware where an air circulating fan head and a light are provided is a dock fan: In terms of numbers, the manufacturer indicated these are fairly rare (probably only 1 to 2% of air circulating fan heads at most), and the light and air circulating fan head are really both added to a separate articulating device. The manufacturer did not know if the light is wired separately of the air circulating fan head, but expected is that it is. In general, the manufacturer offered that there is no utility to be gained by incorporating a light into an air circulating fan head because unlike a ceiling fan, which uses the same (and often only) ceiling electrical source, the air circulating fan head is not designed for this type of hard wire connection.

considered a type of commercial or industrial fan pursuant to 42 U.S.C. 6311. EPCA authorizes DOE to consider establishing "fans" and "blowers" as types of covered commercial or industrial equipment. 42 U.S.C. 6311(2)(B)(ii) and (iii).

DOE notes that under this proposal, the design standards of EPCA applicable to ceiling fans would not apply to fans that do not meet the criteria of the statutory definition, including air circulating fan heads as defined in AMCA 230-15 offered for mounting on surfaces other than or in addition to the ceiling (including the ceiling mount versions of such fans). The energy conservation standards established by DOE would also not be applicable to such products.

AMCA's letter also suggests that a minimum tip speed/outlet air speed is a differentiator for distinguishing between air circulating fan heads and ceiling fans. This differentiator may be appropriate to determine whether the air circulating fan head is for the purpose of circulating air. DOE requests comment and supporting data on what tip speed/outlet air speed is appropriate to differentiate ceiling fans from air circulating fan heads. DOE also seeks comment on whether, and if so, how to update the regulatory criterion at proposed Appendix U, Section 2. Scope, to clarify that air circulating fan heads above a certain tip speed/outlet air speed are not for the purpose of circulating air, as specified in the EPCA criteria for ceiling fans.

DOE is not proposing to change the existing requirement that ceiling fans for which the plane of rotation of the blades is greater than 45 degrees from horizontal, and for which the plane of rotation cannot be adjusted based on the manufacturer's specifications to be less than or equal to 45 degrees from horizontal are not subject to the test procedure or energy conservation standards established by DOE. DOE seeks

comment on whether this provision is necessary to retain in light of the proposal described in the preceding paragraphs for air circulating fan heads.

B. Proposal for VSD Ceiling Fans

In the July 2016 CF TP final rule, DOE amended test procedures, located in Appendix U to subpart B of 10 CFR part 430, for measuring ceiling fan efficiency. The adopted test procedures were largely based on the ENERGY STAR test procedure, "Energy Star Testing Facility Guidance Manual: Building a Testing Facility and Performing the Solid State Test Method for ENERGY STAR Qualified Ceiling Fans, Version 1.1," and AMCA 230-15, with some modifications. See 81 FR 48620. The ENERGY STAR test procedure measures the air velocity using air velocity sensors to calculate airflow, while AMCA 230-15 uses a load cell to measure thrust, which is then used to calculate airflow.

The DOE test procedure established by the July 2016 CF TP final rule requires LSSD and high-speed small-diameter (HSSD) ceiling fans to be tested using methods based on air velocity measurements. The DOE test method is slightly different depending on whether a small-diameter ceiling fan meets the definition of either LSSD ceiling fan or HSSD ceiling fan, which is based on maximum fan tip speed and thickness at the edge of the fan blades. DOE required testing LSSD ceiling fans at their lowest and highest speed settings, but required testing HSSD ceiling fans only at high speed. 81 FR 48620, 48626. For LSSD ceiling fans, while most have one or more speeds between high and low, DOE required testing at only high and low speed to limit test burden and avoid confusion regarding the definition of medium speed for ceiling fans with more than three speeds. For HSSD ceiling fans, DOE determined that they typically do not have discrete speeds,

and therefore speeds other than high may not be well defined; thus, testing is only required at high speed. Id.

In the July 2016 CF TP final rule, DOE prescribed a test method for LSSD and HSSD ceiling fans. However, the HSSD ceiling fan definition excluded VSD ceiling fans. Therefore, the current test method provides a method of testing only those VSD ceiling fans that meet the LSSD ceiling fan definition. In this NOPR, DOE is proposing to specify explicitly that VSD ceiling fans that do not also meet the definition of LSSD fan are not required to be tested pursuant to the DOE test method for purposes of demonstrating compliance with DOE's energy conservation standards for ceiling fans or representations of efficiency.

DOE requests comment on the proposal. See section V.B for a list of issues on which DOE seeks comment.

C. Proposed Alternate Stability Criteria for Average Air Velocity Measurements

In the July 2016 CF TP final rule, DOE established stability criteria for the air velocity measurements for LSSD and HSSD ceiling fans. Specifically, section 3.3.2(1) of Appendix U to subpart B of 10 CFR part 430 requires that the average air velocity for each sensor must vary by less than 5 percent compared to the average air velocity measured for that same sensor in a successive set of air velocity measurements. Stable measurements are required to be achieved at high speed only for HSSD ceiling fans, and at both low and high speed for LSSD ceiling fans. However, ceiling fans with low speeds that produce air velocities lower than 40 feet per minute (fpm) may have trouble meeting this stability criteria. Since the July 2016 CF TP final rule, DOE has received several inquiries from manufacturers citing difficulties with meeting the stability criteria at low

speed for certain basic models of ceiling fans. DOE evaluated available test data to investigate these difficulties and to determine whether increased tolerances for air velocity stability criteria for low speed tests could be used to reduce test burden without materially affecting the results of the test procedure. Specifically, DOE used the test data from ceiling fans tested at a third-party testing facility to compare the airflow and efficiency results of the test procedure with the 5 percent and 10 percent air velocity stability criteria applied to low speed. DOE found that increasing the stability criteria to 10 percent for low speed would allow more fans to meet the stability criteria and reduce the number of successive measurements needed to do so without materially changing the efficiency results of the test procedure. By reducing the number of successive measurements needed this proposed amendment would reduce the test burden for manufacturers, including the total test time per unit for low speed tests for ceiling fans. DOE estimates that manufacturers of LSSD and VSD ceiling fans may save approximately 20 minutes in testing time due to the relaxation of the air velocity stability requirements. The potential cost impacts of this proposal are discussed in section III.I of this NOPR.

An alternative approach that DOE also considered was applying stability criteria to airflow instead of air velocity (as is required under the current DOE test procedure). However, DOE's review concluded that applying stability criteria to airflow instead of air velocity could result in less repeatability by allowing a greater variation in airflow and efficiency results between multiple tests of the same fan. Per the current DOE test procedure, air velocity is measured at each sensor along the sensor arm, and airflow is calculated based on these measurements. The air velocity measurements provide more

information than the calculated airflow because they indicate the amount and location of air provided by the fan within the effective area (*i.e.*, the air profile). DOE found that large variations in air profile often indicate test room instability (e.g., localized temperature gradients that effect airflow). Applying stability criteria to the air velocity measurements ensures that successive sets of measurements result in similar air profiles, which is indicative of test room stability. On the other hand, DOE observed that stability criteria applied only to airflow could be met with large variations in air profile (*i.e.*, at unstable test room conditions). This allows for airflow, and in turn fan efficiency, to vary significantly between multiple tests of the same fan because stable airflow can be achieved at varied test room conditions. DOE expects that the purchase and set up of additional thermocouples in the test room would be required to monitor and ensure test room stability to avoid these repeatability issues. In DOE's own testing evaluation, DOE installed thermocouple grids within the test room when evaluating the impact of applying the stability criteria to airflow in order to get repeatable results. Therefore, DOE concluded that stability criteria based on air velocity measurements leads to more repeatable test results and avoids the potential need for additional set up and test room modifications and costs to monitor test room stability throughout the tests.

Therefore, in this NOPR, DOE is proposing to increase the air velocity stability criteria for testing at low speed from 5 percent to 10 percent. DOE does not expect this proposed amendment to require manufacturers to re-test LSSD and VSD ceiling fans that have been tested and rated per the current test procedure. The proposed amendment increases the tolerance of the stability criteria for low speed tests established in the July 2016 CF TP final rule for fans that require testing at low speed. Any test conducted in

accordance with the current test procedure (under which the stability criteria provides tolerance that is more narrow than that being proposed) would meet the stability criteria specified in this proposal. By letter dated June 14, 2017, BAS submitted a petition for waiver and application for interim waiver for specified basic models of low-speed small-diameter ceiling fans. The proposal in this NOPR is consistent with the methodology of the alternative test method requested by BAS for these basic models and in the interim waiver DOE granted to BAS. In addition, this NOPR fulfills the statutory requirement for DOE to publish in the *Federal Register* a notice of proposed rulemaking and subsequent final rule to amend its regulations so as to eliminate any need for the continuation of such waiver as soon as practicable. 10 CFR 430.27(l).

In the July 2016 CF TP final rule, DOE also established measurement tolerances for air velocity sensors. Section 3.2 of Appendix U states that air velocity sensors must have accuracies within ±5 percent of reading or 2 feet per minute (fpm), whichever is greater. For this NOPR, DOE proposes to add the 2 fpm provision to the stability criteria to provide consistency between the stability criteria for air velocity measurements and the accuracy of air velocity sensors. Specifically, DOE proposes the following stability criteria for low speed tests; the average air velocity for each sensor must vary by less than 10 percent or 2 fpm, whichever is greater, compared to the average air velocity measured for that same sensor in a successive set of air velocity measurements. DOE proposes to add a 2 fpm limitation to the existing stability criteria for high speed tests such that the average air velocity for each sensor must vary by less than 5 percent or 2 fpm, whichever is greater, compared to the average air velocity measured for that same sensor in a successive set of air velocity measurements. In this NOPR, DOE is not proposing to

change the stability criteria for average power measurement for either high or low speed tests, which would remain at 1 percent.

DOE requests comment on the proposed stability criteria. See section V.B of this NOPR for a list of issues on which DOE seeks comment.

Section 3.3.2 of Appendix U to subpart B of 10 CFR part 430 requires that LSSD fans be tested at low speed. Appendix U defines low speed to mean "the lowest available ceiling fan speed, *i.e.*, the fan speed corresponding to the minimum, non-zero, blade RPM". Through testing and industry inquiry, DOE is aware that, in the lowest available fan speed, some ceiling fans have an extremely low rotation rate, leading to atypically low airflow. The airflow is so low that: (1) the airflow sensors used by third-party labs, which are appropriate for most ceiling fans, cannot meet the accuracy requirements of the test procedure; and (2) labs are having trouble meeting the stability criteria despite routinely achieving stability for other fans.

To avoid testing low fan speeds that consumers are unlikely to use to circulate air or that will be impossible or overly burdensome to test, DOE is considering modifying the definition of low speed. Specifically, DOE is considering defining the low speed as the lowest available ceiling fan speed for which fewer than half or three, whichever is fewer, sensors on any individual axis are measuring less than 30 feet per minute. Thirty feet per minute is the threshold below which practicable air velocity sensors can no longer meet the test procedure accuracy and stability requirements. In conjunction, DOE is considering explicit instructions to start at the lowest speed and move to the next highest speed until the modified low speed criteria are met.

DOE seeks comment on whether testing the fan at the lowest available ceiling fan speed as currently required measures the energy use during a representative average use cycle or period of use, as required by EPCA (42 U.S.C. 6293). DOE seeks comment on whether, in the alternate, testing at low speed defined as the lowest available ceiling fan speed for which fewer than half or three, whichever is fewer, sensors on any individual axis are measuring less than 30 feet per minute, would meet these EPCA requirements. Such a test procedure would also require testing to start at the lowest speed and move to the next highest speed until the modified low speed criteria are met. DOE seeks comment on whether this alternate test method would affect the measured energy use of the ceiling fan as compared to the current test procedure.

DOE also seeks comment on whether this alternate test method would reduce the test burden for manufacturers, including the total test time per unit for low speed tests for ceiling fans. The test procedure does not currently specify when to conclude a test if stability criteria cannot be met. In this case, third-party labs have local operating procedures (LOP) that dictate, based on each individual labs' business model, how long to run a test before deeming it invalid. The low speeds in question could require labs to run tests for the full duration of their LOP limit if stability is not met. The alternate test method could mitigate the occurrence of these long, invalid test runs. DOE estimates that manufacturers of LSSD and VSD ceiling fans may save approximately 60 minutes in per unit testing time due to the new low speed criteria. The potential cost impacts are discussed in III.I.3 of this NOPR.

D. Calculation Methodology for Values Reported on the EnergyGuide Label

The U.S. Federal Trade Commission (FTC) adopted a revised EnergyGuide label in a September 15, 2016 Energy Labeling final rule. 81 FR 63634. The rule is applicable to LSSD and VSD ceiling fans, and requires specification of values for certain metrics related to the ceiling fan's performance, including ceiling fan efficiency.[11] See 16 CFR 305.13. DOE subsequently issued a guidance document explaining how to calculate these values, based on measurements taken in accordance with Appendix U.[12] DOE proposes to codify these calculation methods at 10 CFR 429.32(a)(3).

An example of the U.S. FTC's EnergyGuide label for LSSD and VSD ceiling fans is shown in Figure III.1.

[11] In the September 2016 Energy Labeling final rule, the FTC indicated it will seek comment on the need for, and content of, fan labels for high-speed small-diameter and large-diameter ceiling fans. 81 FR 63634, 63637.

[12] *https://www1.eere.energy.gov/buildings/appliance_standards/pdfs/ftc_label_calc_method_2016-10-21.pdf.*

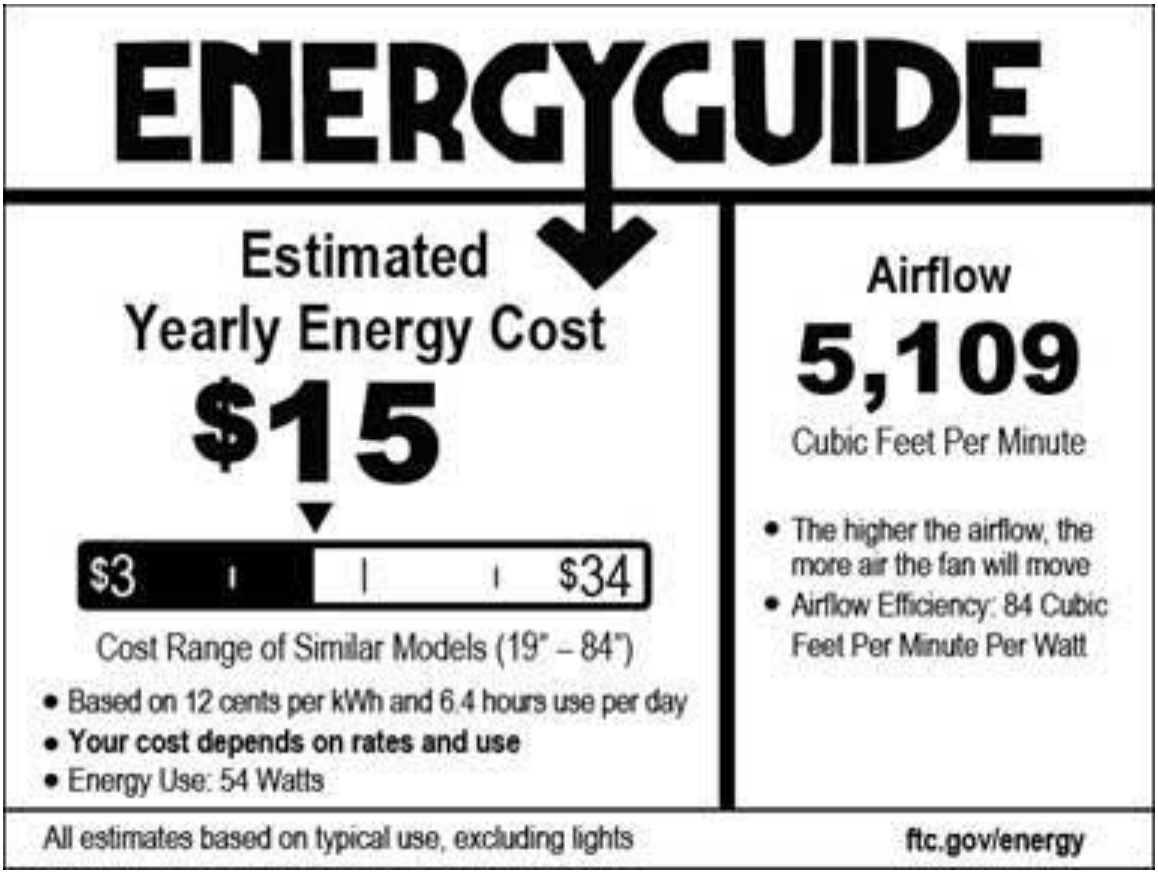

Figure III.1 Example U.S. Federal Trade Commission EnergyGuide label for LSSD and VSD ceiling fans

The EnergyGuide label reports values for four metrics: 1) efficiency (labeled as "Airflow Efficiency"), 2) FTC airflow (labeled as "Airflow"), 3) FTC energy use (labeled as "Energy Use"), and 4) FTC estimated yearly energy cost (labeled as "Estimated Year Energy Cost"). The EnergyGuide label's "Airflow Efficiency" value corresponds to the ceiling fan's represented value of efficiency (see 10 CFR 429.32(a)), in cubic feet per minute per watt, which is defined and measured according to the July 2016 CF TP final rule. Calculation methods for the other three values are provided in subsections III.D.1 through III.D.3 of this NOPR.

1. FTC Airflow

For LSSD and VSD ceiling fans, FTC airflow represents the weighted-average airflow of a ceiling fan, where the weighted average is based on an average of airflow at low and high fan speeds. The weight given to each speed is the average operating hours at that speed normalized by the total average operating hours in active mode. The average operating hours come from Table 3 in Appendix. DOE proposes to include in 10 CFR part 429 the following equation, as specified in the current guidance, to calculate this value:

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

Where:

$Airflow_{FTC}$ = represented value for FTC airflow, rounded to the nearest CFM,

CFM_{Low} = represented value of measured airflow, in cubic feet per minute, at low fan speed, and

CFM_{High}= represented value of measured airflow, in cubic feet per minute, at high fan speed.

Section 3.3 of Appendix U specifies the procedures for measuring the airflow at the high and low speed settings. The measurements of airflow for each setting specified by the equation above must be based on the represented value of measured airflow from a sample of at least two ceiling fans, in accordance with the requirements of 10 CFR 429.32(a)(2)(i). The represented value for FTC airflow is then calculated using the represented value of measured airflow for each setting specified by the equation.

2. FTC Energy Use

For LSSD and VSD ceiling fans, FTC energy use represents the weighted-average power consumption of the ceiling fan, where the weighted average is based on an average of the power consumption at low and high fan speeds and in standby mode. The weight given to each speed and to standby mode is the average operating hours at that setting normalized by the total average operating hours in active mode. As with FTC airflow, the average operating hours come from Table 3 in Appendix U. DOE proposes to include in 10 CFR part 429 the following equation, as specified in the current guidance, to calculate this value:

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

Where:

$Energy\ Use_{FTC}$ = represented value for FTC Energy Use, rounded to the nearest watt,

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

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

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

Section 3.3 of Appendix U outlines the procedures for measuring the power consumption at the high and low speed settings, as well as in standby mode (if applicable). The measurements of power consumption for each setting specified by the equation above must be based on the represented value of power consumption measured from a sample of at least two ceiling fans, in accordance with the requirements of 10 CFR

429.32(a)(2)(ii). The represented value for FTC energy use is then calculated using the represented value of measured power consumption for each setting specified by the equation.

3. FTC Estimated Yearly Energy Cost

For LSSD and VSD ceiling fans, FTC estimated yearly energy cost represents the estimated cost to a consumer of the energy consumed in operating a ceiling fan for a year. Time spent at low speed, high speed, and in standby mode is based on the average operating hours listed in Table 3 in Appendix U. DOE proposes to include in 10 CFR part 429 the following equation, as specified in the current guidance, to calculate this value:

$$EYEC_{FTC} = \frac{W_{Low} \times 3.0 \ + \ W_{High} \times 3.4 + \ W_{Sb} \times 17.6}{1000} \times 365 \times 0.12$$

Where:

$EYEC_{FTC}$ = represented value for FTC estimated yearly energy cost, rounded to the nearest dollar, and all other variable designations are the same as for the equation for FTC energy use.

In calculating this value, the average electricity cost and daily operating hours in active mode are assumed to be 12 cents per kilowatt-hour[13] and 6.4 hours per day, respectively (as displayed on the sample EnergyGuide label in Figure III.1). Section 3.3 of Appendix U to subpart B of 10 CFR part 430 outlines the procedures for measuring the power consumption at the high and low speed settings, as well as in standby mode (if applicable). The measurements of power consumption for each setting specified by the equation above must be based on the represented value of power consumption measured

[13] 12 cents per kilowatt-hour is the cost of energy specified for the Federal Trade Commission's EnergyGuide label. 81 FR 63633 (September 15, 2016)

from a sample of at least two ceiling fans, in accordance with the requirements of 10 CFR 429.32(a)(2)(ii). The represented value for FTC estimated yearly energy cost is then calculated using the represented value of measured power consumption for each setting specified by the equation.

E. Proposal for Large-Diameter Ceiling Fans with Blade Spans Greater than 24 feet

Appendix U requires that large-diameter ceiling fans (*i.e.*, fans with blade spans greater than seven feet) be tested at up to five speeds, and at the five highest speeds for fans with six or more discrete speeds. Section 3.4.1 of Appendix U states that this test method for large-diameter ceiling fans is applicable to ceiling fans up to 24 feet in diameter. In the July 2016 CF TP final rule, DOE included this diameter limit because DOE was unaware of any commercially-available large-diameter ceiling fans with blade spans greater than 24 feet. 81 FR 48620, 48632 (July 25, 2016). Since that time, DOE has received an inquiry about how such a fan would be tested.

The DOE test method for large-diameter ceiling fans incorporates by reference AMCA 230-15, which does not specify a maximum blade span limit. In addition, AMCA 230-15 provides minimum clearances for testing based on blade span so that the required test room dimensions are dynamic and allow for testing of fans larger than 24 feet. In the previous rulemaking, Big Ass Solutions (BAS) recommended that the DOE test procedure not include a blade span limit for the large-diameter test method to be consistent with AMCA 230-15. (BAS, Docket ID: EERE-2013-BT-TP-0050, No. 13, p. 7) In the rulemaking to amend the energy conservation standards for ceiling fans, however, DOE did not contemplate standards for large-diameter fans with blade spans of

greater than 24 feet because none were available on the market at that time. 82 FR 6826, 6843.

Users of ceiling fans with a blade span larger than 24 feet may operate them differently than users of fans with a blade span less than 24 feet. Because DOE did not consider the applicability of the current energy conservation standards to large-diameter fans with blade spans greater than 24 feet, and because the current DOE test procedure specifies a blade span limit of 24 feet, DOE proposes in this rulemaking that large-diameter fans with blade spans of greater than 24 feet do not need to be tested pursuant to the DOE test procedure for purposes of determining compliance with DOE energy conservation standards or making other representations of efficiency. DOE requests comment on its proposal. DOE also requests comment on the availability of sufficient testing facilities for large-diameter fans, including those larger than 24 feet in diameter. See section V.B of this NOPR for a list of issues on which DOE seeks comment.

F. Certification Requirements

The procedures required for determination, certification, and enforcement of compliance of covered products with the applicable conservation standards are set forth in 10 CFR part 429. Ceiling fan manufacturers[14] must submit certification reports for ceiling fan basic models before they are distributed in commerce. 10 CFR 429.12. The current requirements for certification reports for ceiling fans correspond to the design requirements specified in EPCA. (42 U.S.C. 6295(ff)(1)) These requirements are set forth at 10 CFR 429.32(b), which requires reporting of the number of speeds within the ceiling fan controls, and a declaration that the manufacturer has incorporated the applicable

[14] Under EPCA, "manufacture" means "to manufacture, produce, assemble, or import." 42 U.S.C. 6291(10).

design requirements. These certification requirements do not reflect the amended energy conservation standards adopted in the recent ceiling fan energy conservation standards final rule (hereafter the "January 2017 CF ECS final rule").[15] 82 FR 6826 (January 19, 2017).

In this NOPR, DOE proposes to amend the certification requirements for ceiling fans to include product-specific information that would be required to certify compliance with the amended energy conservation standards established in January 2017 CF ECS final rule. The product-specific information is necessary to determine the minimum allowable ceiling fan efficiency and the proper category of certain ceiling fans, like multi-mount and/or multi-head ceiling fans. DOE proposes to require that certification reports include the following public product-specific information for each ceiling fan basic model: (1) represented blade span in inches; (2) represented ceiling fan efficiency in CFM/W; (3) for small-diameter ceiling fans, a declaration whether the fan is a multi-head ceiling fan; and (4) for low-speed small-diameter ceiling fans, a declaration whether the ceiling fan is a multi-mount ceiling fan. For each ceiling fan basic model, DOE also proposes to require additional product-specific information that would not be included in the public CCMS database. These include: (1) for small-diameter ceiling fans, blade edge thickness (in), airflow (CFM) at high speed, and blade revolutions per minute (RPM) at high speed; and (2) for LSSD ceiling fans, the represented distance (in) between the ceiling and the lowest point on the fan blades. Manufacturers are already required to

[15] On January 31, 2017, DOE temporarily postponed the effective date of the January 2017 CF ECS final rule. See 82 FR 8806. DOE further temporarily postponed the effective date of that energy conservation standards regulation until September 30, 2017, to allow the Secretary, who was confirmed and began work in his position March 3, 2017, the opportunity to review and consider the new regulation. See 82 FR 14427, Mar. 21, 2017. On May 24, 2017, DOE published the completion of the review of the final rule amending energy conservation standards for ceiling fans, and confirmed that compliance will remain as required with the January 19 final rule, without change. 82 FR 23723.

determine these values if making representations under the current test procedure for ceiling fans and will be required to use these values to ensure the products they distribute in commerce comply with the amended energy conservation standards.

In this NOPR, DOE also proposes amendments to 10 CFR 429.32 to specify that represented values are to be determined consistent with the test procedures in Appendix U and to specify rounding requirements for represented values. DOE proposes that manufacturers round any represented value of ceiling fan efficiency, expressed in cubic feet per minute per watt (CFM/W), to the nearest whole number. DOE also proposes the following: Any represented value of blade span shall be the mean of the blade spans measured for the sample selected as described in 10 CFR 429.32(a)(1), rounded to the nearest inch; any represented value of blade RPM shall be the mean of the blade RPMs measured for the sample selected as described in 10 CFR 429.32(a)(1), rounded to the nearest RPM; any represented value of blade edge thickness shall be the mean of the blade edge thicknesses measured for the sample selected as described in 10 CFR 429.32(a)(1), rounded to the nearest tenth of an inch; and any represented value of the distance between the ceiling and the lowest point on the fan blades shall be the mean of the distances measured for the sample selected as described in 10 CFR 429.32(a)(1), rounded to the nearest quarter of an inch.

DOE is also proposing updates to the product class definitions included in Appendix U to reference the proposed represented value provisions to specify that the product class for each basic model is determined using the represented values of blade span, blade RPM, blade edge thickness, and the distance between the ceiling and the lowest point on the fan blades.

Blade edge thickness and the distance between the ceiling and the lowest point on the fan blades are used to determine the product class to which a basic model belongs. The July 2016 CF TP final rule did not provide instructions on how to measure these parameters. In this NOPR, DOE is proposing to include these instructions in Appendix U to subpart B of 10 CFR part 430 to ensure these parameters are measured consistently for representations and verification. Specifically, DOE proposes that blade edge thickness for small diameter fans be measured at the fan blade leading edge (in the forward direction) with an instrument having a measurement resolution of at least a tenth of an inch. DOE has observed that blade edge thickness is typically measured with calipers or a tape measure, either of which could meet the proposed measurement resolution requirement. Ceiling fan blades do not have uniform shapes, including blade edge thickness variations and tapered tips or leading edges. DOE proposes the following instructions for measuring blade edge thickness to ensure test procedure reproducibility, given these variations in blade characteristics: 1) Measure at the point at which the blade is thinnest along the radial length of the fan blade and is greater than or equal to one inch from the tip of the fan blade, and 2) Measure one inch from the leading edge of the fan blade. These provisions are proposed to account for ceiling fan blades that have tapered tips or tapered leading edges. DOE also proposes to use an instrument having a measurement resolution of at least 0.25 inches to measure the distance between the ceiling and the lowest point on the ceiling fan blades for LSSD ceiling fans. DOE has observed that this measurement is typically taken using a tape measure, which should easily meet the proposed measurement resolution requirement.

Blade span is also used to determine the product class to which a basic model belongs. The July 2016 CF TP final rule required blade span to be determined by measuring the lateral distance from the center of the axis of rotation of the fan blades to the furthest fan blade edge from the center of the axis of rotation, and then multiplying this distance by two. In this NOPR, DOE is proposing to add to these instructions to ensure that blade span is measured consistently for representations and verification. Specifically, DOE is proposing to measure the lateral distance at the resolution of the measurement instrument, using an instrument with a measurement resolution of least 0.25 inches, and then multiply this distance by two to determine blade span. As in the July 2016 CF TP final rule, after multiplying the lateral distance by two, blade span must be rounded to the nearest whole inch.

G. Product-Specific Enforcement Provisions

In the January 2017 CF ECS final rule, DOE's amended energy conservation standards are expressed as the minimum allowable ceiling fan efficiency (in terms of CFM/W) as a function of ceiling fan blade span, in inches, for each ceiling fan product class. DOE has also defined ceiling fan product classes based on certain characteristics, including the blade span, distance between the lowest point of the fan blades and the ceiling, RPM at high speed, and blade edge thickness. Represented values, including certified values, of each of these characteristics would be determined in accordance with the proposed provisions of 10 CFR 429.32.

DOE proposes to add provisions to 10 CFR 429.134 for verification of these represented values in 10 CFR 429.134, to be used in the context of enforcement of the relevant efficiency standards. Each of the following paragraphs describes the proposed

DOE verification provisions for each parameter. In each case, DOE would measure the relevant characteristic for each individual unit in accordance with the test requirements of Appendix U.

DOE proposes to consider the represented blade span valid if the rounded measurement(s) (either the measured value for a single unit, or the mean of the measured values for a multiple unit sample, rounded to the nearest inch) are the same as the represented blade span. Blade span may vary slightly between ceiling fan units due to manufacturing tolerances and blade warpage. However, the proposed rounding provisions for blade span (10 CFR part 429) would require that the blade span be rounded to the nearest inch. This effectively would provide a range of approximately 1 inch that would require the same minimum ceiling fan efficiency. For example, a blade span of 52.4 inches would be rounded down to 52 inches, and a blade span of 51.5 inches would also be rounded to 52 inches. This range is larger than the expected variation in blade span due to manufacturing variation or blade warpage. Therefore, DOE is not proposing an additional tolerance for blade span verification. DOE proposes that if the represented blade span is found to be valid, that blade span would be used as the basis for calculating minimum allowable ceiling fan efficiency. If the represented blade span is found to be invalid, the rounded measured blade span would serve as the basis for calculating the minimum allowable ceiling fan efficiency.

DOE proposes that the distance between the lowest point of the fan blades and the ceiling for each LSSD unit be rounded to the nearest quarter of an inch. This effectively would provide a tolerance range of approximately 0.25 inches. DOE proposes to consider the represented distance between the lowest point of the fan blades and the ceiling valid if

the measurement(s) (either the measured value for a single unit, or the mean of the measured values for a multiple unit sample, rounded to the nearest quarter inch) are the same as the represented distance. Furthermore, DOE proposes that, if the represented distance is found to be valid, that distance would be used as the basis for determining the product class. If the represented distance is found to be invalid, the rounded measured distance would serve as the basis for determining the product class.

DOE proposes to consider the represented blade RPM at high speed valid if the measurement(s) (either the measured value for a single unit, or the mean of the measured values for a multiple unit sample, rounded to the nearest RPM) are within the greater of 1% or 1 RPM of the represented blade RPM at high speed. DOE is proposing these tolerances because they are consistent with the tolerances established in the July 2016 CF TP final rule to determine RPM measurements for large-diameter ceiling fans that can operate over an infinite number of speeds (see section 3.5(2) of Appendix U to subpart B of part 430). DOE proposes that, if the represented RPM is found to be valid, that RPM would be used as the basis for determining the product class. If the certified RPM is found to be invalid, the measured RPM would serve as the basis for determining the product class.

Represented values, including certified values, of blade edge thickness would be in accordance with the proposed represented value provisions in 10 CFR 429.32. The proposed rounding provisions for blade edge thickness (10 CFR part 429) would require that the thickness be rounded to the nearest tenth of an inch. This effectively would provide a tolerance range of approximately 0.1 inches. DOE proposes to consider the represented blade edge thickness valid if the measurement(s) (either the measured value

for a single unit, or the mean of the measured values for a multiple unit sample, rounded to the nearest tenth of an inch) are the same as the represented blade edge thickness. DOE proposes that, if the represented blade edge thickness is found to be valid, that blade edge thickness would be used as the basis for determining the product class. If the represented blade edge thickness is found to be invalid, the rounded measured blade edge thickness would serve as the basis for determining the product class.

DOE seeks comment on the proposed method for verifying the blade span, the distance between the ceiling and lowest point of the fan blades, RPM at high speed, and the blade edge thickness.

H. Compliance Dates and Waivers

EPCA prescribes that all representations of energy efficiency and energy use, including those made on marketing materials and product labels, must be made in accordance with an amended test procedure, beginning 180 days after publication of such a test procedure final rule in the *Federal Register*. (42 U.S.C. 6293(c)(2)) If DOE were to publish an amended test procedure EPCA provides an allowance for individual manufacturers to petition DOE for an extension of the 180-day period if the manufacturer may experience undue hardship in meeting the deadline. (42 U.S.C. 6293(c)(3)) To receive such an extension, petitions must be filed with DOE no later than 60 days before the end of the 180-day period and must detail how the manufacturer will experience undue hardship. (Id.)

Upon the compliance date, i.e., 180 days after publication of any final rule amending the test procedure, should DOE issue such an amendment, any waivers that had been previously issued and are in effect that pertain to issues addressed by the amended

test procedure are terminated. 10 CFR 430.27(h)(2). Recipients of any such waivers would be required to test the products subject to the waiver according to the amended test procedure as of the effective date of the amended test procedure. As discussed in section III.C of this NOPR the amendments proposed in this document would address the issues that are the subject of the interim waiver DOE granted to BAS.

As discussed in section III.C of this NOPR, DOE does not expect any of these amendments to impact the measures of energy consumption or efficiency for the basic models that were tested in accordance with the July 2016 CF TP final rule. As discussed, DOE is proposing to specify that VSD ceiling fans that do not also meet the definition of LSSD fan are not required to be tested pursuant to the DOE test method for purposes of demonstrating compliance with DOE's energy conservation standards for ceiling fans or representations of efficiency; increase the tolerances for the stability criteria at low speed; codify existing guidance regarding the calculation of certain values required for FTC labels; specify that fans with a blade span larger than 24 feet are not required to be tested pursuant to the DOE test procedure for purposes of determining compliance with the energy conservation standards established by DOE; revise the certification requirements to reflect the reporting necessary under the recently amended ceiling fan energy conservation standards; and specify measurement procedures for verifying certain represented ceiling fan characteristics.

I. Test Procedure Costs and Impact

EPCA requires that test procedures proposed by DOE not be unduly burdensome to conduct. In this NOPR, DOE proposes: (1) to interpret the term "ceiling fan" as defined by EPCA to mean those fans offered for mounting only on a ceiling. Any fan,

including a ceiling-mount air circulating fan head, offered with other mounting options would not be a ceiling fan; (2) to specify that VSD ceiling fans that do not also meet the definition of LSSD fan are not required to be tested pursuant to the DOE test method for purposes of demonstrating compliance with DOE's energy conservation standards for ceiling fans or representations of efficiency; (3) to increase the tolerance for the stability criteria for the average air velocity measurements for LSSD and VSD ceiling fans; (4) to codify in regulation existing guidance on the method for calculating several values reported on the Federal Trade Commission (FTC) EnergyGuide label for LSSD and VSD ceiling fans using results from the ceiling fan test procedures in Appendix U to subpart B of 10 CFR part 430 and represented values in 10 CFR part 429; (5) to specify that large-diameter ceiling with blade spans greater than 24 feet do not need to be tested pursuant to the DOE test procedure for purposes of demonstrating compliance with DOE energy conservation standards or representations of energy efficiency are; and (6) to amend certification requirements and product-specific enforcement provisions for ceiling fans to reflect the most recent amendments to the test procedures and energy conservation standards for ceiling fans. DOE has tentatively determined that these proposed amendments to the ceiling fan test procedure would not be unduly burdensome for manufacturers to conduct and would reduce test burden for manufacturers.

DOE's analyses of this proposal indicate that, if finalized, it would result in a net cost savings to manufacturers.

TABLE III.1 Summary of Cost Impacts for Ceiling Fans

Category	Present Value *(million 2016$)*	Discount Rate *(percent)*
Cost Savings		
Reduction in Scope (testing costs)	0.30	3
	0.13	7
Reduction in Scope (conversion costs)	0.75	3
	0.64	7
Reduction in Future Testing Costs	0.14	3
	0.05	7
Reduction in Upfront Testing Costs (*i.e.*, Purchase of Testing Equipment)	0.81	3
	0.70	7
Total Net Cost Impacts		
Total Net Cost Impacts	(2.01)	3
	(1.52)	7

TABLE III.2 Summary of Annualized Cost Impacts for Ceiling Fans

Category	Annualized Value *(thousands 2016$)*	Discount Rate *(percent)*
Annualized Cost Savings		
Reduction in Scope (testing costs)	9	3
	9	7
Reduction in Scope (conversion costs)	22	3
	45	7
Reduction in Future Testing Costs	4	3
	4	7
Reduction in Upfront Testing Cost (*i.e.*, Purchase of Testing Equipment)	24	3
	49	7
Total Net Annualized Cost Impacts		
Total Net Cost Impacts	(60)	3
	(107)	7

Further discussion of the cost impacts of the proposed test procedure amendments are presented in the following paragraphs.

1. Cost impacts for scope

As discussed in section III.A of this NOPR, in advance of the compliance date of the energy conservation standards DOE is proposing to amend the regulatory text to interpret the term “ceiling fan” as defined by EPCA to mean those fans offered for mounting only on a ceiling. Any fan, including a ceiling-mount air circulating fan head,

offered with other mounting options would not be a ceiling fan. Based on a review of the ceiling fan market, DOE has observed that fans with more than one mounting option tend to be fans with thin blades, high tip speeds, and a guard. Accordingly, DOE identified that the majority of the fans that would be properly classified as outside the definition of a ceiling fan based on the clarification of the statutory scope would be from the HSSD product class.

Based on a review of the ceiling fan market, DOE estimates there are approximately 219 models that ceiling fan manufacturers could potentially consider HSSD ceiling fans based on the ceiling fan definition in Appendix U. DOE estimated that approximately 10 percent of these models meet the proposed definition of an air circulating fan head that has more than one mounting option beyond a ceiling mount, and therefore would not be subject to DOE's test procedure and energy conservation standards for ceiling fans. Therefore, DOE estimates that approximately 22 models would not need to be tested nor potentially redesigned to meet the upcoming energy conservation standards.

DOE estimates that ceiling fan manufacturers incur approximately $1,525 to test HSSD ceiling fans.[16] Therefore, DOE estimates that ceiling fan manufacturers would have incurred cost of approximately $33,550 in 2020, the year energy conservation standards become effective and ceiling fan manufacturers are required to test and certify all covered ceiling fans. Additionally, DOE anticipates that ceiling fan manufacturers will introduce a new or modified model once every 3.5 years, therefore, on average ceiling fan manufacturers would introduce approximately 6 new or modified HSSD ceiling fan

[16] This is based on the testing cost described in the July 2016 CF TP final rule (81 FR 48620, 48636). This cost is in 2015$.

models each year. Based on these estimates, ceiling fan manufacturers would have incurred approximately $9,150 in testing costs each year after 2020. Due to the proposed scope clarification ceiling fan manufacturers would no longer incur these testing costs.

In addition to the cost savings from avoiding testing costs, ceiling fan manufacturers would not incur conversion costs associated with redesigning models that ceiling fan manufacturers could have potentially considered HSSD ceiling fans based on the existing ceiling fan definition, but are not considered ceiling fans based on the proposed clarification. As part of the January 2017 CF ECS final rule, DOE estimated the conversion costs of the adopted energy conservation standards for HSSD ceiling fans. 82 FR 6826 (January 19, 2017). DOE estimated that ceiling fan manufacturers would incur approximately $8.3 million in conversion costs to convert all non-compliant HSSD ceiling fans into compliant models by the 2020 compliance date.[17] As previously stated, DOE estimates that approximately 10 percent of basic models that manufacturers have certified as HSSD ceiling fans, but that meet the proposed definition of air circulating fan head, would not be subject to DOE's energy conservation standards for ceiling fans. Therefore, DOE estimates that ceiling fan manufacturers would have incurred approximately $831,000 in conversion costs to convert these products leading up to the 2020 energy conservation standards compliance date. Due to the proposed scope clarification ceiling fan, manufacturers would be certain that they no longer need to incur these conversion costs.

[17] The conversion cost estimates presented in the January 2017 CF ECS final rule are broken out by product class in the published GRIM. The January 2017 CF ECS adopted EL 4 for HSSD ceiling fans. Capital conversion costs for HSSD ceiling fans at EL 4 were $5.5 million (2015$) and product conversion costs at EL 4 were $2.8 million (2015$).

DOE requests comment on its assumptions and understanding of the estimated impact and associated cost savings to ceiling fan manufacturers regarding DOE's proposal to clarify the scope. Additionally, DOE requests comment on any potential cost not accounted for in the analysis that ceiling fan manufacturers may incur due to this proposed clarification.

2. Cost impacts for stability criteria

As discussed in section III.C of this NOPR, DOE is proposing to increase the tolerance for the stability criteria for the average air velocity measurements of LSSD and VSD ceiling fans that meet the definition of LSSD fans at low speed, and to codify in regulation current guidance on calculating reported values on the FTC EnergyGuide label. Based on review of the DOE's Compliance Certification Database (CCD), DOE identified 22 unique manufacturers that make 3,339 unique basic models of LSSD fans and seven unique basic models of VSD fans.[18] basic models.

DOE expects its proposal to increase the tolerance for the average air velocity stability criteria for low speed tests would reduce the number of successive measurements needed for LSSD and VSD ceiling fans without materially changing the efficiency results (see section III.C of this NOPR for further details). The reduction in the number of successive measurements required to achieve stability would reduce the time to conduct the test, also reducing the per unit cost to test for LSSD and VSD fans. DOE estimates

[18] DOE identified 7,231 ceiling fan entries in DOE's CCD on February 26, 2019. Of those models, 3,473 are unique basic models. There are 35 fans that have a diameter less than or equal to 18 inches. Seven of which are VSD fans that meet the definition of LSSD fans and 28 which do not, and therefore are not subject to the DOE test procedure. Additionally, there are 3,434 fans that either have a diameter more than 18 inches and less than or equal to 84 inches, or do not have a diameter listed in CCD. DOE assumed all these fans were either LSSD or HSSD fans. Of these fans, 95 are HSSD fans and 3,339 are LSSD fans. Lastly, there are four fans that are large diameter fans with diameters greater than 84 inches.

that the proposed amendments to the stability criteria may save approximately 20 minutes in testing time for each LSSD or VSD fan tested. DOE estimates the average wage rate plus employer provided benefits for an employee to conduct these tests is $36.40 per hour.[19] There are 688 LSSD fan models and seven VSD fan models affected by this stability criteria proposal.[20] DOE anticipates that manufacturers would introduce new or modified models once every 3.5 years, therefore, on average manufacturers would introduce approximately 199 new or modified LSSD and VSD fan models each year and would be required to test each fan model at least twice in accordance with this test procedure. Using these estimates, DOE anticipates cost savings of approximately $4,829 each year for all LSSD and VSD ceiling fans affected by the proposed stability criteria.[21]

In addition to the testing cost savings, manufacturers would likely experience cost savings from avoiding the need to purchase additional and more-costly air velocity sensors. Manufacturers are having trouble achieving stability in low speed using their current sensors. DOE is aware that upgrading air velocity sensors may be one way that manufacturers can meet the stability criteria required by the current test procedure. Upgraded sensors can cost between two and ten times as much as the standard sensors that manufacturers typically use for ceiling fan testing. To test ceiling fans up to 84 inches in diameter with an air velocity sensor every 4 inches and in all four axes could

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[19] The Bureau of Labor Statistics mean hourly wage rate for a "Mechanical Engineering Technician" is $28.00. (May 2018; *https://www.bls.gov/oes/current/oes173027.htm*).)
Additionally, according to the Annual Survey of Manufacturers for NAICS code 335210, small electrical appliance manufacturing, wages represent approximately 77 percent of total cost of employment. (AMS 2016, NAICS code 335210; *https://www.census.gov/programs-surveys/asm.html*).)

[20] Of the 3,339 LSSD fans DOE identified, there were 688 unique basic models with more than 3 speed control settings. DOE used this criteria to estimate the number of LSSD models that would be affect by this proposed stability criteria. Additionally, DOE assumed all seven VSD models would be affected as well.

[21] This calculation includes a reduction of 20 minutes in testing time, applied to 199 models each year, 2 tests per model, and an hourly employment cost of $36.40 [(20/60) * 199 * 2 * $36.40 = $4,829].

require a manufacturer to purchase, calibrate, and install as many as 45 upgraded sensors. DOE estimates that this investment would be approximately $50,000 per manufacturer for these upgraded sensors.

Of the 22 companies DOE identified that make LSSD or VSD ceiling fans for which these stability criteria apply and upgraded sensors may be needed, DOE assumed that only companies making multiple models for which these stability criteria apply to would purchase these upgraded sensors. The other manufacturers that only have a single ceiling fan model needing these upgraded sensors were assumed to contract third-party labs for testing. In these cases, the third-party labs will bear the cost of any necessary sensor upgrades. DOE estimates that 19 manufacturers would have invested in upgraded sensors to meet the stability criteria to comply with the current test procedure. Therefore, DOE estimates that the industry-wide one-time avoided cost due to this proposal would be approximately $950,000.

DOE requests comment on its assumptions and understanding of the estimated impact and associated cost savings to ceiling fan manufacturers regarding DOE's proposal to increase the tolerance for the stability criteria for the average air velocity measurements of LSSD and VSD ceiling fans that meet the definition of LSSD fans at low speed. Additionally, DOE requests comment on any potential cost manufacturers may incur, if any, due to this proposed amendment.

3. Potential cost impacts if the low speed criteria definition is modified

In addition to proposing to increase the tolerance for the stability criteria for the average air velocity measurements of LSSD and VSD ceiling fans, DOE might consider modifying the low speed criteria definition, which is required to test LSSD and VSD

ceiling fans, as discussed in section III.C of this NOPR. Based on review of the DOE's CCD, DOE identified 22 unique manufacturers that make 3,339 unique basic models of LSSD fans and seven unique basic models of VSD fans.[22]

DOE anticipates that this potential modification in definition could reduce the total test time for a portion of LSSD and VSD ceiling fans when conducting the low speed tests. DOE anticipates that manufacturers of LSSD and VSD ceiling fans could save approximately 60 minutes in testing time for certain LSSD and VSD models if the low speed criteria definition is adopted. As stated in the previous section, DOE estimated there are 688 LSSD fan models and seven VSD fan models affected by the stability criteria proposal. DOE estimates that approximately 10 percent of these LSSD and VSD ceiling fans affected by the stability criterial proposal could also be affected by the potential low speed criteria definition modification. As previously stated, DOE anticipates that manufacturers would introduce new or modified models once every 3.5 years. Therefore, on average manufacturers would introduce approximately 20 new or modified LSSD and VSD fan models that could be affected each year by the potential low speed criteria definition modification and would be required to test each fan model at least twice in accordance with this test procedure.[23] Using these estimates, DOE

[22] DOE identified 7,231 ceiling fan entries in DOE's CCD on February 26, 2019. Of those models, 3,473 are unique basic models. There are 35 fans that have a diameter less than or equal to 18 inches. Seven of which are VSD fans that meet the definition of LSSD fans and 28 which do not, and therefore are not subject to the DOE test procedure. Additionally, there are 3,434 fans that either have a diameter more than 18 inches and less than or equal to 84 inches, or do not have a diameter listed in CCD. DOE assumed all these fans were either LSSD or HSSD fans. Of these fans, 95 are HSSD fans and 3,339 are LSSD fans. Lastly, there are four fans that are large diameter fans with diameters greater than 84 inches.

[23] There are 688 LSSD ceiling fans and 7 VSD ceiling fans. Approximately 10 percent of those fans could be impacted by the potential low speed definition modification, so there are approximately 70 ceiling fans potentially impacted [(688 + 7) * 0.10 = 69.5]. The design cycle for ceiling fans is approximately 3.5 years for a model, so on average 20 new ceiling fan models would be introduced that could be affected by the potential low speed definition modification [69.5 / 3.5 = 19.9].

anticipates potential cost savings of approximately $1,456 each year for all LSSD and VSD ceiling fans affected by the potential low speed criteria definition modification.[24]

DOE requests comment on its assumptions and understanding of the anticipated impact and potential cost savings to ceiling fan manufacturers if DOE modifies the low speed criteria definition. Additionally, DOE requests comment on any potential cost manufacturers may incur, if any, due to this definition is modified.

4. Cost impacts for other test procedure amendments

This notice proposes to specify that fans with blade spans larger than 24 feet are not required to be tested pursuant to the DOE test procedure for purposes of determining compliance with the energy conservation standards established by DOE or making other representations of efficiency. As stated in section III.E of this NOPR, DOE has not identified any ceiling fans on the market with a blade span greater than 24 feet. As such DOE does not expect there to be a cost impact resulting from this proposed amendment.

Additionally, DOE believes that the other proposed amendments will provide manufacturers with greater certainty in the conduct of the test procedures. Regarding the proposed amendments to the certification provisions, manufacturers are already required to determine the values added under the proposal if making representations under the current test procedure for ceiling fans and will be required to use these values to ensure the products they distribute in commerce comply with the amended energy conservation standards. In addition, the proposed certification requirements will be necessary once compliance with the amended standards is required and should not increase burden. DOE

[24] This calculation includes a reduction of 60 minutes in testing time, applied to 20 models each year, 2 tests per model, and an hourly employment cost of $36.40 [(60/60) * 20 * 2 * $36.40 = $1,456].

does not estimate manufacturers would incur any additional costs or cost savings from these additional proposed test procedure amendments.

DOE requests comment on any potential cost or cost savings, that DOE did not account for, that ceiling fan manufacturers may incur due to these additional test procedure amendments.

J. Other Test Procedure Topics

In addition to the issues identified earlier in this document, DOE welcomes comment on any other aspect of the existing test procedure for ceiling fans not already addressed by the specific areas identified in this document. DOE particularly seeks information that would improve the representativeness of the test procedure, as well as information that would help DOE create a procedure that would limit manufacturer test burden. Comments regarding repeatability and reproducibility are also welcome. In particular, DOE notes that under Executive Order 13771, "Reducing Regulation and Controlling Regulatory Costs," Executive Branch agencies such as DOE must manage the costs associated with the imposition of expenditures required to comply with Federal regulations. See 82 FR 9339 (Feb. 3, 2017). Consistent with that Executive Order, DOE encourages the public to provide input on measures DOE could take to lower the cost of its regulations applicable to ceiling fans consistent with the requirements of EPCA.

IV. Procedural Issues and Regulatory Review

A. Review Under Executive Order 12866

The Office of Management and Budget (OMB) 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.

B. Review Under Executive Orders 13771 and 13777

On January 30, 2017, the President issued Executive Order (E.O.) 13771, "Reducing Regulation and Controlling Regulatory Costs." E.O. 13771 stated the policy of the executive branch is to be prudent and financially responsible in the expenditure of funds, from both public and private sources. E.O. 13771 stated it is essential to manage the costs associated with the governmental imposition of private expenditures required to comply with Federal regulations.

Additionally, on February 24, 2017, the President issued E.O. 13777, "Enforcing the Regulatory Reform Agenda." E.O. 13777 required the head of each agency designate an agency official as its Regulatory Reform Officer (RRO). Each RRO oversees the implementation of regulatory reform initiatives and policies to ensure that agencies effectively carry out regulatory reforms, consistent with applicable law. Further, E.O. 13777 requires the establishment of a regulatory task force at each agency. The regulatory task force is required to make recommendations to the agency head regarding the repeal, replacement, or modification of existing regulations, consistent with applicable law. At a minimum, each regulatory reform task force must attempt to identify regulations that:

(i) Eliminate jobs, or inhibit job creation;

(ii) Are outdated, unnecessary, or ineffective;

(iii) Impose costs that exceed benefits;

(iv) Create a serious inconsistency or otherwise interfere with regulatory reform initiatives and policies;

(v) Are inconsistent with the requirements of Information Quality Act, or the guidance issued pursuant to that Act, in particular those regulations that rely in whole or in part on data, information, or methods that are not publicly available or that are insufficiently transparent to meet the standard for reproducibility; or

(vi) Derive from or implement Executive Orders or other Presidential directives that have been subsequently rescinded or substantially modified.

DOE initially concludes that this rulemaking is consistent with the directives set forth in these executive orders. This proposed rule is estimated to result in cost savings. Assuming a 7 percent discount rate, the proposed rule would yield annualized cost savings of approximately $107,000 (2016$). Therefore, if finalized as proposed, this rule is expected to be an E.O. 13771 deregulatory action.

C. 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 website: *http://energy.gov/gc/office-general-counsel*.

The July 2016 CF TP final rule assessed potential impacts on small businesses associated with ceiling fan test requirements. Specifically, DOE assessed the projected costs of testing, and provided description of steps taken to minimize impacts to small businesses. 81 FR 48620 (July 25, 2016) The January 2017 CF ECS final rule assessed potential impacts on small businesses associated with the ceiling fan energy conservation standards requirements. 82 FR 6826 (January 19, 2017) Specifically, DOE estimated total conversion costs for small ceiling fan manufacturers, and provided discussion on steps taken to minimize the impacts. DOE had identified six companies in the July 2016 CF TP final rule that are small businesses that maintain domestic production facilities, four of which manufacture HSSD ceiling fans, and three manufacture large-diameter ceiling fans.[25] DOE did not, however, identify any LSSD or VSD ceiling fan small businesses that maintain domestic production facilities.

This notice proposes amendments to the test procedures and certification requirements for ceiling fans. This rulemaking provides further specifications to existing requirements for testing and compliance with standards and does not materially change the burden associated with ceiling fan regulations on small entities regulated by the rulemaking. Specifically, DOE proposes to specify that VSD ceiling fans that do not also meet the definition of LSSD fan are not required to be tested pursuant to the DOE test method for purposes of demonstrating compliance with DOE's energy conservation standards for ceiling fans or representations of efficiency. This proposal, which would not

[25] One small business manufactures both HSSD ceiling fans and large-diameter ceiling fans.

require testing of any additional fans, would not result in a significant impact to a substantial number of small entities. In addition, as stated above, DOE did not identify any small LSSD or VSD ceiling fan manufacturers that maintain domestic production facilities.

DOE also proposes to increase the tolerance for stability criteria for the average air velocity measurements for LSSD and VSD ceiling fans at low speed to reduce test burden without significantly changing test procedure results. As discussed in section III.I, this proposal is expected to reduce the test procedure burdens associated with testing time and investments in testing equipment. In addition, DOE proposes to codify current guidance on calculating several values reported on the FTC EnergyGuide label for LSSD and VSD ceiling fans, which is expected to provide manufacturers additional certainty in reporting test measurements to DOE and to harmonize DOE and FTC reporting requirements. While as noted above, DOE did not identify any small LSSD or VSD ceiling fan manufacturers with domestic production facilities at this time, this proposal would lower the burden on any small business that determined to manufacture such fans domestically. In addition, DOE proposes to interpret the term "ceiling fan" as defined by EPCA to mean those fans offered for mounting only on a ceiling. Any fan, including a ceiling-mount air circulating fan head, offered with other mounting options would not be a ceiling fan.

DOE also proposes to specify that fans with a blade span larger than 24 feet are not required to be tested according to the DOE test procedure for large-diameter fans for purposes of determining compliance with DOE energy conservation standards or to make other representations of efficiency; this proposal is not expected to increase the testing

costs for large diameter fans. As stated in section III.E of this NOPR, DOE has not identified any ceiling fans on the market with a blade span greater than 24 feet. As such DOE does not expect there to be a cost impact resulting from this proposed amendment. This cost would remain at approximately $4,000 per ceiling fan, and these costs would not accrue to any additional fans with diameters greater than 24 feet. In this proposal, DOE would also amend certification requirements and product-specific enforcement provisions for consistency with the current test procedure and recently amended energy conservation standards for ceiling fans; specifically, this proposal would specify the use of the methods currently in Appendix U for verifying certain ceiling fan characteristics. DOE does not expect this proposal to significantly impact manufacturers because they are already required to determine these values if making representations under the current test procedure for ceiling fans, and because the proposal clarifies how these values would be made when compliance with standards is required.

For these reasons, DOE certifies that this rulemaking will not have a significant economic impact on a substantial number of small entities. Accordingly, DOE did not prepare an IRFA for this rulemaking. DOE's certification and supporting statement of factual basis will be provided to the Chief Counsel for Advocacy of the Small Business Administration for review under 5 U.S.C. 605(b).

D. Review Under the Paperwork Reduction Act of 1995

Manufacturers of ceiling fans must certify to DOE that their products comply with any applicable energy conservation standards. To certify compliance, manufacturers must first obtain test data for their products according to the DOE test procedures, including any amendments adopted for those test procedures. DOE has established regulations for

the certification and recordkeeping requirements for all covered consumer products and commercial equipment, including ceiling fans. (*See generally* 10 CFR part 429.) The collection-of-information requirement for the certification and recordkeeping is subject to review and approval by OMB under the Paperwork Reduction Act (PRA). This requirement has been approved by OMB under OMB control number 1910-1400. Public reporting burden for the certification is estimated to average 35 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.

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.

E. Review Under the National Environmental Policy Act of 1969

DOE is analyzing this proposed regulation in accordance with the National Environmental Policy Act (NEPA) and DOE's NEPA implementing regulations (10 CFR part 1021). DOE's regulations include a categorical exclusion for rulemakings interpreting or amending an existing rule or regulation that does not change the environmental effect of the rule or regulation being amended. 10 CFR part 1021, subpart D, appendix A5. DOE anticipates that this rulemaking qualifies for categorical exclusion A5 because it is an interpretive rulemaking that does not change the environmental effect of the rule and otherwise meets the requirements for application of a categorical

exclusion. See 10 CFR 1021.410. DOE will complete its NEPA review before issuing the final rule.

F. 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 has examined this proposed rule and has determined that it would 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 this proposed 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.

G. 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, the proposed rule meets the relevant standards of Executive Order 12988.

H. 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 No. 104-4, sec. 201 (codified at 2

U.S.C. 1531). For a proposed regulatory action likely to result 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://energy.gov/gc/office-general-counsel*. DOE examined this proposed 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.

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

Section 654 of the Treasury and General Government Appropriations Act, 1999 (Public Law 105-277) requires Federal agencies to issue a Family Policymaking Assessment for any rule that may affect family well-being. This proposed rule would 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.

J. 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 would not result in any takings that might require compensation under the Fifth Amendment to the U.S. Constitution.

K. 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 this proposed rule under the OMB and DOE guidelines and has concluded that it is consistent with applicable policies in those guidelines.

L. 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 proposed 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 proposed significant energy action, the agency must give a detailed

statement of any adverse effects on energy supply, distribution, or use should the proposal be implemented, and of reasonable alternatives to the action and their expected benefits on energy supply, distribution, and use.

The proposed regulatory action to amend the test procedure for measuring the energy efficiency of ceiling fans 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.

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

Under section 301 of the Department of Energy Organization Act (Public Law 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.

The proposed modifications to the test procedure for ceiling fans adopted in this final rule do not incorporate any new standards that would require consultation under section 32(b) of the FEAA.

N. Description of Materials Incorporated by Reference

In this NOPR, DOE proposes to incorporate by reference the test standard published by ANSI/AMCA Standard 230-15 ("AMCA 230-15"), titled "Laboratory Methods of Testing Air Circulating Fans for Rating and Certification." Specifically, the test procedure proposed by this NOPR references a definition provided in AMCA 230-15. AMCA 230-15 is an industry-standard test procedure for measuring the airflow efficiency of commercial and industrial ceiling fans. AMCA 230-15 is available from Air Movement and Control Association International, Inc. (AMCA), 30 West University Drive, Arlington Heights, IL 60004, (847) 394-0150, or by going to *http://www.amca.org/store/item.aspx?ItemId=81*.

V. Public Participation

A. Submission of Comments

DOE invites all interested partied to submit in writing by [**INSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER***] comments and information regarding this proposed rule.

Submitting comments via *http://www.regulations.gov*. The *http://www.regulations.gov* web page will require you to provide your name and contact information prior to submitting comments. Your contact information will be viewable to DOE Building Technologies staff only. Your contact information will not be publicly viewable except for your first and last names, organization name (if any), and submitter representative name (if any). If your comment is not processed properly because of technical difficulties, DOE will use this information to contact you. If DOE cannot read

your comment due to technical difficulties and cannot contact you for clarification, DOE may not be able to consider your comment.

However, your contact information will be publicly viewable if you include it in the comment or in any documents attached to your comment. Any information that you do not want to be publicly viewable should not be included in your comment, nor in any document attached to your comment. Persons viewing comments will see only first and last names, organization names, correspondence containing comments, and any documents submitted with the comments.

Do not submit to *http://www.regulations.gov* information for which disclosure is restricted by statute, such as trade secrets and commercial or financial information (hereinafter referred to as Confidential Business Information (CBI)). Comments submitted through *http://www.regulations.gov* cannot be claimed as CBI. Comments received through the website will waive any CBI claims for the information submitted. For information on submitting CBI, see the Confidential Business Information section.

DOE processes submissions made through *http://www.regulations.gov* before posting. Normally, comments will be posted within a few days of being submitted. However, if large volumes of comments are being processed simultaneously, your comment may not be viewable for up to several weeks. Please keep the comment tracking number that *http://www.regulations.gov* provides after you have successfully uploaded your comment.

Submitting comments via email, hand delivery, or mail. Comments and documents submitted via email, hand delivery, or mail also will be posted to *http://www.regulations.gov*. If you do not want your personal contact information to be

publicly viewable, do not include it in your comment or any accompanying documents. Instead, provide your contact information on a cover letter. Include your first and last names, email address, telephone number, and optional mailing address. The cover letter will not be publicly viewable as long as it does not include any comments.

Include contact information in your cover letter each time you submit comments, data, documents, and other information to DOE. If you submit via mail or hand delivery, please provide all items on a CD, if feasible. It is not necessary to submit printed copies. No facsimiles (faxes) will be accepted.

Comments, data, and other information submitted to DOE electronically should be provided in PDF (preferred), Microsoft Word or Excel, WordPerfect, or text (ASCII) file format. Provide documents that are not secured, written in English and free of any defects or viruses. Documents should not contain special characters or any form of encryption and, if possible, they should carry the electronic signature of the author.

Campaign form letters. Please submit campaign form letters by the originating organization in batches of between 50 to 500 form letters per PDF or as one form letter with a list of supporters' names compiled into one or more PDFs. This reduces comment processing and posting time.

Confidential Business Information. According to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via email, postal mail, or hand delivery two well-marked copies: one copy of the document marked confidential including all the information believed to be confidential, and one copy of the document marked non-confidential with the information believed to be confidential deleted. Submit these documents via email or

on a CD, if feasible. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

Factors of interest to DOE when evaluating requests to treat submitted information as confidential include (1) a description of the items, (2) whether and why such items are customarily treated as confidential within the industry, (3) whether the information is generally known by or available from other sources, (4) whether the information has previously been made available to others without obligation concerning its confidentiality, (5) an explanation of the competitive injury to the submitting person which would result from public disclosure, (6) when such information might lose its confidential character due to the passage of time, and (7) why disclosure of the information would be contrary to the public interest.

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

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

B. Issues on Which DOE Seeks Comment

Although comments are welcome on all aspects of this proposed rulemaking, DOE is particularly interested in comments on the proposal to interpret the term “ceiling fan” as defined by EPCA to mean those fans offered for mounting only on a ceiling. Any fan, including a ceiling-mount air circulating fan head, offered with other mounting options would not be a ceiling fan. DOE also seeks comment on the alternative interpretation of the term “ceiling fan” to mean that any fan, including those meeting the definition of an “air circulating fan head” in AMCA 230-2015, that does not have a ceiling mount option, or that has more than one mounting option (even if one of the mounting options is a ceiling mount), is not a ceiling fan. Such fans do not meet the statutory criteria of being “nonportable”, “suspended from the ceiling”, and “for the purpose of circulating air.” DOE also requests comment and supporting data on what tip speed/outlet air speed is appropriate as another means to differentiate ceiling fans from air circulating fan heads that are not ceiling fans. DOE also seeks comment on the extent to which the design criteria in EPCA do or do not apply to air circulating fan heads, as a factual matter. DOE also seeks comment on whether it is necessary to retain the exception for ceiling fans where the plane of rotation of the ceiling fan's blades is greater than 45 degrees from horizontal, and for which the plane of rotation cannot be adjusted based on the manufacturer's specifications to be less than or equal to 45 degrees from horizontal; proposed clarification to the ceiling fan test procedure to not require testing for VSD ceiling fans that do not also meet the definition of LSSD fan; the proposed alternate stability criteria for average air velocity measurements; the potential modification of the low speed definition; the proposed calculation methods for values

reported on the EnergyGuide label; the proposal to not require testing for large-diameter ceiling fans with blade spans greater than 24 feet and the availability of sufficient testing facilities for large-diameter fans, including those larger than 24 feet in diameter; the proposed certification requirements and product-specific enforcement provisions; and its understanding of the impact and associated cost savings (or potential costs) of these proposed amendments.

VI. Approval of the Office of the Secretary

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

List of Subjects

10 CFR Part 429

Confidential business information, Energy conservation, Household appliances, Imports, Reporting and Recordkeeping requirements.

10 CFR Part 430

Administrative practice and procedure, confidential business information, Energy conservation, Household appliances, Imports, Incorporation by reference, Intergovernmental relations, Small businesses.

Signed in Washington, DC, on September 9, 2019.

_____

Alexander N. Fitzsimmons
Acting Deputy Assistant Secretary for Energy Efficiency
Energy Efficiency and Renewable Energy

For the reasons stated in the preamble, DOE proposes to amend parts 429 and 430 of Chapter II of Title 10, Code of Federal Regulations as set forth below:

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

1. The authority citation for part 429 continues to read as follows:

   Authority: 42 U.S.C. 6291-6317; 28 U.S.C. 2461 note.

2. Section 429.32 is amended by:

   a. Revising the paragraph (a)(2) introductory text and paragraph (a)(2)(ii)(B);

   b. Adding paragraphs (a)(3) and (4);

   c. Revising paragraph (b);

   d. Adding paragraph (c).

The revisions and additions read as follows:

§429.32 Ceiling fans.

(a) * * *

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

* * * * *

(ii) * * *

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

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

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

(3) For each basic model of ceiling fan,

(i) Any represented value of blade span, as defined in section 1.7 of appendix U to subpart B of part 430, is the mean of the blade spans measured for the sample selected as described in paragraph (a)(1) of this section, rounded to the nearest inch; and

(ii) Any represented value of blade revolutions per minute (RPM) is the mean of the blade RPM measurements measured for the sample selected as described in paragraph (a)(1) of this section, rounded to the nearest RPM; and

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

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

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

(4) To determine values required by the Federal Trade Commission (FTC), use the following provisions. Note that, for multi-mount ceiling fans these values must be

reported on the EnergyGuide label for the ceiling fan configuration with the lowest efficiency.

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

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

Where:

$Airflow_{FTC}$ = represented value for FTC airflow, rounded to the nearest CFM,

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

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

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

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

Where:

$Energy\ Use_{FTC}$ = represented value for FTC Energy Use, rounded to the nearest watt,

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

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

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

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

$$EYEC_{FTC} = \frac{W_{Low} \times 3.0 \ + \ W_{High} \times 3.4 + \ W_{Sb} \times 17.6}{1000} \times 365 \times 0.12$$

Where:

$EYEC_{FTC}$ = represented value for FTC estimated yearly energy cost, rounded to the nearest dollar, and

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

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

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

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

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

(i) For all ceiling fans: Blade span (in), ceiling fan efficiency (CFM/W) (in both hugger and standard configurations for multi-mount fans), the number of speeds within the ceiling fan controls, and a declaration that the manufacturer has incorporated the applicable design requirements.

(ii) For small-diameter ceiling fans: a declaration whether the ceiling fan is a multi-head ceiling fan.

(iii) For low-speed small-diameter ceiling fans: A declaration whether the ceiling fan is a multi-mount ceiling fan.

(3) Pursuant to §429.12(b)(13), a certification report shall include the following additional product-specific information for small-diameter ceiling fans: blade edge thickness (in), airflow (CFM) at high speed, blade RPM at high speed, and the distance (in) between the ceiling and the lowest point on the fan blades (in both hugger and standard configurations for multi-mount fans).

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

3. Section 429.134 is amended by adding paragraph (s) to read as follows:

§429.134 Product-specific enforcement provisions.

* * * * *

(s) *Ceiling Fans*--(1) *Verification of blade span.* DOE will measure the blade span and round the measurement pursuant to the test requirements of 10 CFR part 430 of this chapter for each unit tested. DOE will consider the represented blade span valid only if the rounded measurement(s) (either the rounded measured value for a single unit, or the mean of the rounded measured values for a multiple unit sample, rounded to the nearest inch) is the same as the represented blade span.

(i) If DOE determines that the represented blade span is valid, that blade span will be used as the basis for determining the product class and calculating the minimum allowable ceiling fan efficiency.

(ii) If DOE determines that the represented blade span is invalid, DOE will use the rounded measured blade span(s) as the basis for determining the product class, and calculating the minimum allowable ceiling fan efficiency.

(2) *Verification of the distance between the ceiling and lowest point of fan blades.* DOE will measure the distance between the ceiling and lowest point of the fan blades and round the measurement pursuant to the test requirements of 10 CFR part 430 of this chapter for each unit tested. DOE will consider the represented distance valid only if the rounded measurement(s) (either the measured value for a single unit, or the mean of the measured values for a multiple unit sample, rounded to the nearest quarter inch) are the same as the represented distance.

(i) If DOE determines that the represented distance is valid, that distance will be used as the basis for determining the product class.

(ii) If DOE determines that the represented distance is invalid, DOE will use the rounded measured distance(s) as the basis for determining the product class.

(3) *Verification of blade revolutions per minute (RPM) measured at high speed.* DOE will measure the blade RPM at high speed pursuant to the test requirements of 10 CFR part 430 of this chapter for each unit tested. DOE will consider the represented blade RPM measured at high speed valid only if the measurement(s) (either the measured value for a single unit, or the mean of the measured values for a multiple unit sample,

rounded to the nearest RPM) are within the greater of 1% or 1 RPM of the represented blade RPM at high speed.

(i) If DOE determines that the represented RPM is valid, that RPM will be used as the basis for determining the product class.

(ii) If DOE determines that the represented RPM is invalid, DOE will use the rounded measured RPM(s) as the basis for determining the product class.

(4) *Verification of blade edge thickness.* DOE will measure the blade edge thickness and round the measurement pursuant to the test requirements of 10 CFR part 430 for each unit tested. DOE will consider the represented blade edge thickness valid only if the measurement(s) (either the measured value for a single unit, or the mean of the measured values for a multiple unit sample, rounded to the nearest tenth of an inch) are the same as the represented blade edge thickness.

(i) If DOE determines that the represented blade edge thickness is valid, that blade edge thickness will be used for determining product class.

(ii) If DOE determines that the represented blade edge thickness is invalid, DOE will use the rounded measured blade edge thickness(es) as the basis for determining the product class.

PART 430--ENERGY CONSERVATION PROGRAM FOR CONSUMER PRODUCTS

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

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

5. Section 430.2 is amended by revising the definition of “Ceiling fan” to read as follows:

§430.2 Definitions.

* * * * *

Ceiling fan means a nonportable device that is suspended from a ceiling for circulating air via the rotation of fan blades. For purposes of this definition, the term "suspended from a ceiling" means offered for mounting on a ceiling, and the term "nonportable" means not offered for mounting on a surface other than a ceiling. For all other ceiling fan-related definitions, see appendix U to this subpart.

[Alternatively, *Ceiling fan* means a nonportable device that is suspended from a ceiling for circulating air via the rotation of fan blades. DOE interprets this term to mean that any fan, including those meeting the definition of an "air circulating fan head" in AMCA 230-15 (incorporated by reference; see §430.3), that does not have a ceiling mount option, or that has more than one mounting option (even if one of the mounting options is a ceiling mount), is not a ceiling fan. Such fans do not meet the statutory criteria of being "nonportable", "suspended from the ceiling", and "for the purpose of circulating air." For all other ceiling fan-related definitions, see appendix U to this subpart.]

* * * * *

6. Section 430.3 is amended by adding paragraph (b)(4) to read as follows:

§430.3 Materials incorporated by reference.

* * * * *

(b) * * *

(4) ANSI/AMCA Standard 230-15 ("AMCA 230-15"), "Laboratory Methods of Testing Air Circulating Fans for Rating and Certification," ANSI approved October 16, 2015, IBR approved for §430.2 to this subpart.

* * * * *

7. Section 430.23 is amended by revising paragraph (w) to read as follows:

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

* * * * *

(w) *Ceiling fans*. Measure the following attributes of a single ceiling fan in accordance with appendix U to this subpart: airflow; power consumption; ceiling fan efficiency; distance between the ceiling and lowest point of fan blades; blade span; blade edge thickness; and blade revolutions per minute (RPM).

* * * * *

8. Appendix U to subpart B of part 430 is amended by:

a. Revising sections 1.7, 1.11, 1.12, 1.13, 1.14, 1.16, 1.20, 1.21, and 1.23;

b. Revising section 3, 3.2, 3.2.2(1), 3.2.2(4), 3.2.2(6), 3.2.3, 3.3, 3.3.1(4), 3.3.2(1), 3.3.2(1) Step 1, 3.3.2(1) Step 7, 3.4.1, 3.6(1)(i) and (ii) and 4.

The revisions and additions read as follows:

Appendix U to Subpart B of Part 430—Uniform Test Method for Measuring the Energy Consumption of Ceiling Fans

* * * * *

1.7. *Blade span* means the diameter of the largest circle swept by any part of the fan blade assembly, including attachments. The represented value of blade span (D) is as determined in 10 CFR 429.32.

* * * * *

1.11. *High-speed small-diameter (HSSD) ceiling fan* means a small-diameter ceiling fan that is not a very-small-diameter ceiling fan, highly-decorative ceiling fan or belt-driven ceiling fan and that has a represented value of blade edge thickness,

as determined in 10 CFR 429.32(a)(2)(v), of less than 3.2 mm or a maximum represented value of tip speed, as determined in 10 CFR 429.32(a)(2)(vii), greater than the applicable limit specified in the table in this definition.

High-Speed Small-Diameter Ceiling Fan Blade and Tip Speed Criteria				
Airflow Direction	Thickness (t) of Edges of Blades		Tip Speed Threshold	
	Mm	Inch	m/s	feet per minute
Downward-only	$4.8 > t \geq 3.2$	$3/16 > t \geq 1/8$	16.3	3,200
Downward-only	$t \geq 4.8$	$t \geq 3/16$	20.3	4,000
Reversible	$4.8 > t \geq 3.2$	$3/16 > t \geq 1/8$	12.2	2,400
Reversible	$t \geq 4.8$	$t \geq 3/16$	16.3	3,200

1.12. *Highly-decorative ceiling fan* means a ceiling fan with a maximum represented value of blade revolutions per minute (RPM), as determined in 10 CFR 429.32(a)(2)(iv), of 90 RPM, and a represented value of airflow at high speed, as determined in 10 CFR 429.32(a)(2)(i), of less than 1,840 CFM.

1.13. *Hugger ceiling fan* means a low-speed small-diameter ceiling fan that is not a very-small-diameter ceiling fan, highly-decorative ceiling fan, or belt-driven ceiling fan, and for which the represented value of the distance between the ceiling and the lowest point on the fan blades, as determined in 10 CFR 429.32(a)(2)(vi), is less than or equal to 10 inches.

1.14. *Large-diameter ceiling fan* means a ceiling fan that is not a highly-decorative ceiling fan or belt-driven ceiling fan and has a represented value of blade span, as determined in 10 CFR 429.32(a)(2)(iii), greater than seven feet and not greater than 24 feet.

* * * * *

1.16. *Low-speed small-diameter (LSSD) ceiling fan* means a small-diameter ceiling fan that has a represented value of blade edge thickness, as determined in 10 CFR 429.32(a)(2)(v), greater than or equal to 3.2 mm and a maximum represented value of tip speed, as determined in 10 CFR 429.32(a)(2)(vii), less than or equal to the applicable limit specified in the table in this definition.

Low-Speed Small-Diameter Ceiling Fan Blade and Tip Speed Criteria				
Airflow Direction	Thickness (t) of Edges of Blades		Tip Speed Threshold	
	Mm	Inch	m/s	feet per minute
Reversible	$4.8 > t \geq 3.2$	$3/16 > t \geq 1/8$	12.2	2,400
Reversible	$t \geq 4.8$	$t \geq 3/16$	16.3	3,200

* * * * *

1.20. *Small-diameter ceiling fan* means a ceiling fan that has a represented value of blade span, as determined in 10 CFR 429.32(a)(2)(iii), less than or equal to seven feet.

1.21. *Standard ceiling fan* means a low-speed small-diameter ceiling fan that is not a very-small-diameter ceiling fan, highly-decorative ceiling fan or belt-driven ceiling fan, and for which the represented value of the distance between the ceiling and the lowest point on the fan blades, as determined in 10 CFR 429.32(a)(2)(vi), is greater than 10 inches.

* * * * *

1.23. *Very-small-diameter (VSD) ceiling fan* means a small-diameter ceiling fan that is not a highly-decorative ceiling fan or belt-driven ceiling fan; and has one or more fan heads, each of which has a represented value of blade span, as

determined in 10 CFR 429.32(a)(2)(iii), of 18 inches or less. Only VSD fans that also meet the definition of an LSSD fan are required to be tested for purposes of determining compliance with energy efficiency standards established by DOE and for other representations of energy efficiency.

* * * * *

3. *General Instructions, Test Apparatus, and Test Measurement:*

The test apparatus and test measurement used to determine energy performance depend on the ceiling fan's blade span, and in some cases the ceiling fan's blade edge thickness. For each tested ceiling fan, measure the lateral distance from the center of the axis of rotation of the fan blades to the furthest fan blade edge from the center of the axis of rotation. Measure this lateral distance at the resolution of the measurement instrument, using an instrument with a measurement resolution of least 0.25 inches. Multiply the lateral distance by two and then round to the nearest whole inch to determine the blade span. For ceiling fans having a blade span greater than 18 inches and less than or equal to 84 inches, measure the ceiling fan's blade edge thickness. To measure the fan blade edge thickness, use an instrument with a measurement resolution of at least one tenth of an inch and measure the thickness of one fan blade's leading edge (in the forward direction) direction) according to the following:

(1) At the point at which the blade is thinnest along the radial length of the fan blade and is greater than or equal to one inch from the tip of the fan blade, and

(2) One inch from the leading edge of the fan blade. See Figure 1 of this appendix for an instructional schematic on making the fan blade edge thickness measurement. Figure 1

depicts a ceiling fan from above. Round the measured blade edge thickness to the nearest tenth of an inch.

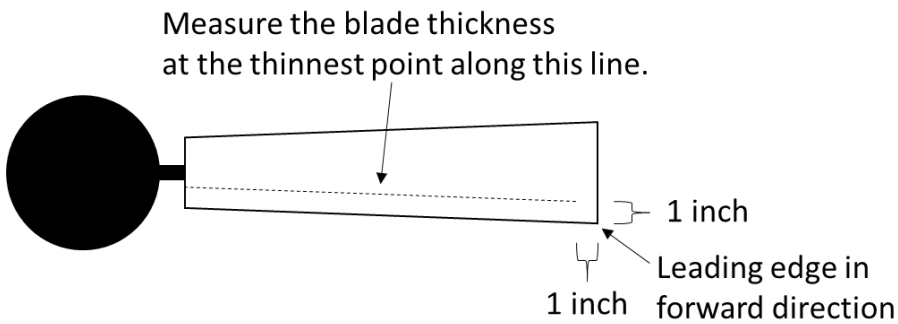

Figure 1 to Appendix U to Subpart B of Part 430: Measurement Criteria for Fan Blade Edge Thickness

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3.2 Test apparatus for low-speed small-diameter, very-small-diameter, and high-speed small-diameter ceiling fans: All instruments are to have accuracies within ±1% of reading, except for the air velocity sensors, which must have accuracies within ±5% of reading or 2 feet per minute (fpm), whichever is greater. Equipment is to be calibrated at least once a year to compensate for variation over time.

* * * * *

3.2.2. *Equipment Set-up*

(1) Make sure the transformer power is off. Hang the ceiling fan to be tested directly from the ceiling, according to the manufacturer's installation instructions. Hang all non-multi-mount ceiling fans in the fan configuration that minimizes the distance between the ceiling and the lowest point of the fan blades. Hang and test multi-mount fans in two configurations: The configuration associated the definition of a standard fan that

minimizes the distance between the ceiling and the lowest point of the fan blades and the configuration associated with the definition of a hugger fan that minimizes the distance between the ceiling and the lowest point of the fan blades. For all tested configurations, measure the distance between the ceiling and the lowest point of the fan blade using an instrument with a measurement resolution of at least 0.25 inches. Round the measured distance from the ceiling to the lowest point of the fan blade to the nearest quarter inch.

* * * * *

(4) Either a rotating sensor arm or four fixed sensor arms can be used to take air velocity measurements along four axes, labeled A-D. Axes A, B, C, and D are at 0, 90, 180, and 270 degree positions. Axes A-D must be perpendicular to the four walls of the room. See Figure 2 of this appendix.

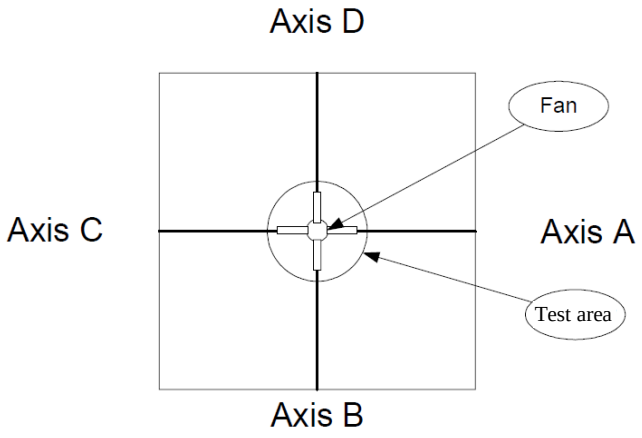

Figure 2 to Appendix U to Subpart B of Part 430: Testing Room and Sensor Arm Axes

* * * * *

(6) Place the sensors at intervals of 4 ± 0.0625 inches along a sensor arm, starting with the first sensor at the point where the four axes intersect. Do not touch the actual sensor prior to testing. Use enough sensors to record air delivery within a circle 8 inches larger in diameter than the blade span of the ceiling fan being tested. The experimental set-up is shown in Figure 3 of this appendix.

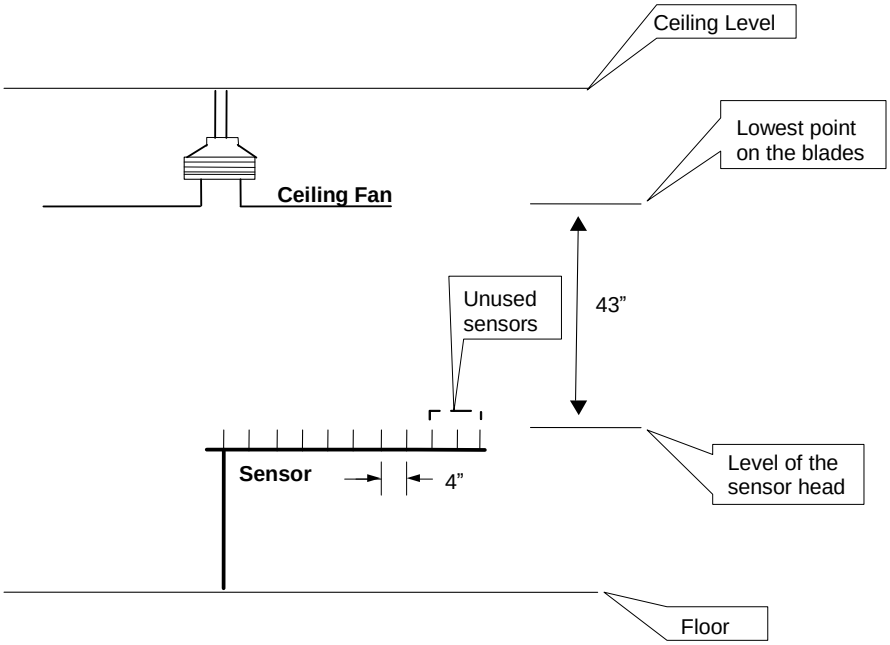

Figure 3 to Appendix U to Subpart B of Part 430: Air Delivery Room Set-Up for Small-Diameter Ceiling Fans

* * * * *

3.2.3. *Multi-Head Ceiling Fan Test Set-Up*

Hang a multi-headed ceiling fan from the ceiling such that one of the ceiling fan heads is centered directly over sensor 1 (i.e., at the intersection of axes A, B, C, and D). The distance between the lowest point any of the fan blades of the centered fan head can reach and the air velocity sensors is to be such that it is the same as for all other small-

diameter ceiling fans (see Figure 3 of this appendix). If the multi-head ceiling fan has an oscillating function (i.e., the fan heads change their axis of rotation relative to the ceiling) that can be switched off, switch it off prior to taking air velocity measurements. If any multi-head fan does not come with the blades preinstalled, install fan blades only on the fan head that will be directly centered over the intersection of the sensor axes. (Even if the fan heads in a multi-head ceiling fan would typically oscillate when the blades are installed on all fan heads, the ceiling fan is subject to this test procedure if the centered fan head does not oscillate when it is the only fan head with the blades installed.) If the fan blades are preinstalled on all fan heads, measure air velocity in accordance with section 3.3 of this appendix except turn on only the centered fan head. Take the power consumption measurements separately, with the fan blades installed on all fan heads and with any oscillating function, if present, switched on.

* * * * *

3.3 *Active mode test measurement for low-speed small-diameter, very-small-diameter and high-speed small-diameter ceiling fans*.

3.3.1 *Test conditions to be followed when testing*:

* * * * *

(4) If present, turn off any oscillating function causing the axis of rotation of the fan head(s) to change relative to the ceiling during operation prior to taking air velocity measurements. Turn on any oscillating function prior to taking power measurements.

* * * * *

3.3.2 *Air Velocity and Power Consumption Testing Procedure:*

Measure the air velocity (fpm) and power consumption (W) for HSSD ceiling fans until stable measurements are achieved, measuring at high speed only. Measure the air velocity and power consumption for LSSD and VSD ceiling fans that also meet the definition of an LSSD fan until stable measurements are achieved, measuring first at low speed and then at high speed. Air velocity and power consumption measurements are considered stable for high speed if:

(1) The average air velocity for each sensor varies by less than 5% or 2 fpm, whichever is greater, compared to the average air velocity measured for that same sensor in a successive set of air velocity measurements, and

(2) Average power consumption varies by less than 1% in a successive set of power consumption measurements.

Air velocity and power consumption measurements are considered stable for low speed if:

(1) The average air velocity for each sensor varies by less than 10% or 2 fpm, whichever is greater, compared to the average air velocity measured for that same sensor in a successive set of air velocity measurements, and

(2) Average power consumption varies by less than 1% in a successive set of power consumption measurements.

These stability criteria are applied differently to ceiling fans with airflow not directly downward. See section 3.3.3 of this appendix.

* * * * *

Step 2: Set software up to read and record air velocity, expressed in feet per minute (fpm) in 1 second intervals. (Temperature does not need to be recorded in 1 second intervals.) Record current barometric pressure.

Step 3: Allow test fan to run 15 minutes at rated voltage and at high speed if the ceiling fan is an HSSD ceiling fan. If the ceiling fan is an LSSD or VSD ceiling fan that also meets the definition of an LSSD fan, allow the test fan to run 15 minutes at the rated voltage and at low speed. Turn off all forced-air environmental conditioning equipment entering the chamber (e.g., air conditioning), close all doors and vents, and wait an additional 3 minutes prior to starting test session.

Step 4a: For a rotating sensor arm: Begin recording readings. Starting with Axis A, take 100 air velocity readings (100 seconds run-time) and record these data. For all fans except multi-head fans and fans capable of oscillating, also measure power during the interval that air velocity measurements are taken. Rotate the arm and repeat for Axes B, C, and D; save these data as well. Record the average value of the power measurement in watts (W) (400 readings). Record the average value of the air velocity readings for each sensor in feet per minute (fpm) (400 readings).

Step 4b: For four fixed sensor arms: Begin recording readings. Take 100 air velocity readings (100 seconds run-time) and record these data. Take the readings for all sensor arms (Axes A, B, C, and D) simultaneously. For all fans except multi-head fans and fans capable of oscillating, also measure power during the interval that air velocity measurements are taken. Record the average value of the power measurement in watts

(W) (100 readings). Record the average value of the air velocity readings for each sensor in feet per minute (fpm) (100 readings).

Step 5: Repeat step 4a or 4b until stable measurements are achieved.

Step 6: Repeat steps 1 through 5 above on high speed for LSSD and VSD ceiling fans that also meet the definition of an LSSD fan. Note: Ensure that temperature and humidity readings are maintained within the required tolerances for the duration of the test (all tested speeds). Forced-air environmental conditioning equipment may be used and doors and vents may be opened between test sessions to maintain environmental conditions.

Step 7: If testing a multi-mount ceiling fan, repeat steps 1 through 6 with the ceiling fan in the ceiling fan configuration (associated with either hugger or standard ceiling fans) not already tested.

If a multi-head ceiling fan includes more than one category of ceiling fan head, then test at least one of each unique category. A fan head with different construction that could affect air movement or power consumption, such as housing, blade pitch, or motor, would constitute a different category of fan head.

Step 8: For multi-head ceiling fans, measure active (real) power consumption in all phases simultaneously at each speed continuously for 100 seconds with all fan heads turned on, and record the average value at each speed in watts (W).

For ceiling fans with an oscillating function, measure active (real) power consumption in all phases simultaneously at each speed continuously for 100 seconds with the oscillating function turned on. Record the average value of the power measurement in watts (W).

For both multi-head ceiling fans and fans with an oscillating function, repeat power consumption measurement until stable power measurements are achieved.

* * * * *

3.3.3 *Air Velocity Measurements for Ceiling Fans with Airflow Not Directly Downward*:

Using the number of sensors that cover the same diameter as if the airflow were directly downward, record air velocity at each speed from the same number of continuous sensors with the largest air velocity measurements. This continuous set of sensors must be along the axis that the ceiling fan tilt is directed in (and along the axis that is 180 degrees from the first axis). For example, a 42-inch fan tilted toward axis A may create the pattern of air velocity shown in Figure 4 of this appendix. As shown in Table 1 of this appendix, a 42-inch fan would normally require 7 active sensors per axis. However, because the fan is not directed downward, all sensors must record data. In this case, because the set of sensors corresponding to maximum air velocity are centered 3 sensor positions away from the sensor 1 along the A axis, substitute the air velocity at A axis sensor 4 for the average air velocity at sensor 1. Take the average of the air velocity at A axis sensors 3 and 5 as a substitute for the average air velocity at sensor 2, take the average of the air velocity at A axis sensors 2 and 6 as a substitute for the average air velocity at sensor 3, etc. Lastly, take the average of the air velocities at A axis sensor 10 and C axis sensor 4 as a substitute for the average air velocity at sensor 7. Stability criteria apply after these substitutions. For example, air velocity stability at sensor 7 are determined based on the average of average air velocity at A axis sensor 10 and C axis sensor 4 in successive

measurements. Any air velocity measurements made along the B-D axis are not included in the calculation of average air velocity.

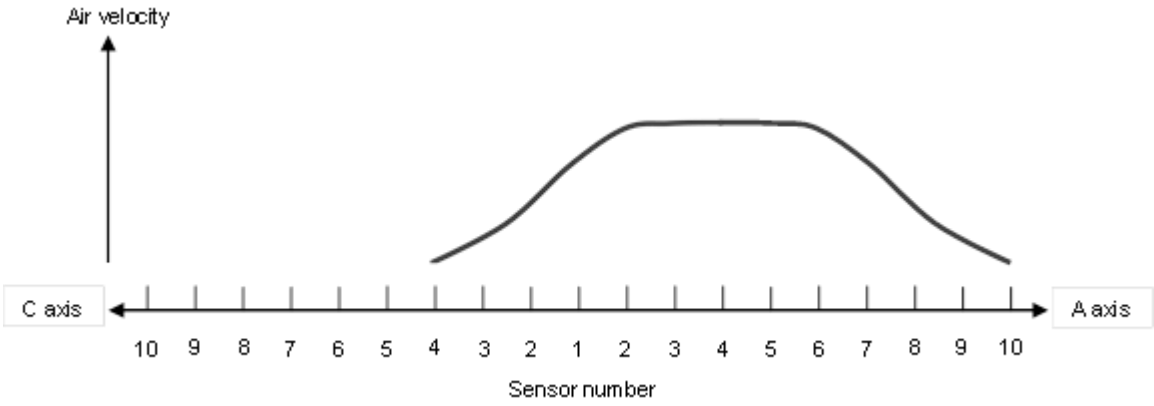

Figure 4 to Appendix U to Subpart B of Part 430: Example Air Velocity Pattern for Airflow Not Directly Downward

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3.4.1 The test procedure is applicable to all large-diameter ceiling fans.

* * * * *

3.6 Test measurement for standby power consumption.

(1) * * *

(i) The ability 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.

* * * * *

4. Calculation of Ceiling Fan Efficiency From the Test Results:

4.1 Calculation of effective area for small-diameter ceiling fans:

Calculate the effective area corresponding to each sensor used in the test method for small-diameter ceiling fans (section 3.3 of this appendix) with the following equations:

(1) For sensor 1, the sensor located directly underneath the center of the ceiling fan, the effective width of the circle is 2 inches, and the effective area is:

$$\boldsymbol{Effective\ Area\ (sq.ft.) = \pi\left(\frac{2}{12}\right)^2 = 0.0873} \qquad \textbf{Eq. 1}$$

(2) For the sensors between sensor 1 and the last sensor used in the measurement, the effective area has a width of 4 inches. If a sensor is a distance *d*, in inches, from sensor 1, then the effective area is:

$$\boldsymbol{Effective\ Area\ (sq.ft.) = \pi\left(\frac{d+2}{12}\right)^2 - \pi\left(\frac{d-2}{12}\right)^2} \qquad \textbf{Eq. 2}$$

(3) For the last sensor, the width of the effective area depends on the horizontal displacement between the last sensor and the point on the ceiling fan blades furthest radially from the center of the fan. The total area included in an airflow calculation is the area of a circle 8 inches larger in diameter than the ceiling fan blade span (as specified in section 3 of this appendix).

Therefore, for example, for a 42-inch ceiling fan, the last sensor is 3 inches beyond the end of the ceiling fan blades. Because only the area within 4 inches of the end of the ceiling fan blades is included in the airflow calculation, the effective width of the circle

corresponding to the last sensor would be 3 inches. The calculation for the effective area corresponding to the last sensor would then be:

$$\boldsymbol{Effective\ Area\ (sq.ft.) = \pi\left(\frac{d+1}{12}\right)^2 - \pi\left(\frac{d-2}{12}\right)^2 = \pi\left(\frac{24+1}{12}\right)^2 - \pi\left(\frac{24-2}{12}\right)^2 = 3.076} \quad \textbf{Eq. 3}$$

For a 46-inch ceiling fan, the effective area of the last sensor would have a width of 5 inches, and the effective area would be:

$$\boldsymbol{Effective\ Area\ (sq.ft.) = \pi\left(\frac{d+3}{12}\right)^2 - \pi\left(\frac{d-2}{12}\right)^2 = \pi\left(\frac{24+3}{12}\right)^2 - \pi\left(\frac{24-2}{12}\right)^2 = 5.345} \quad \textbf{Eq. 4}$$

4.2 Calculation of airflow and efficiency for ceiling fans:

Calculate fan airflow using the overall average of both sets of air velocity measurements at each sensor position from the successive sets of measurements that meet the stability criteria from section 3.3 of this appendix. To calculate airflow for HSSD, LSSD, and VSD ceiling fans, multiply the overall average air velocity at each sensor position from section 3.3 (for high speed for HSSD, LSSD, and VSD ceiling fans that also meet the definition of an LSSD fan, and repeated for low speed only for LSSD and VSD ceiling fans that also meet the definition of an LSSD fan) by that sensor's effective area (see section 4.1 of this appendix), and then sum the products to obtain the overall calculated airflow at the tested speed.

For each speed, using the overall calculated airflow and the overall average power consumption measurements from the successive sets of measurements for small-diameter ceiling fans, or the airflow and power consumption measurements from section 3.5 of this

appendix for all tested settings for large-diameter ceiling fans, calculate ceiling fan efficiency as follows:

$$\boldsymbol{Ceiling\ Fan\ Efficiency\ (CFM/W)} = \frac{\sum_i (\boldsymbol{CFM_i} \times \boldsymbol{OH_i})}{\boldsymbol{W_{Sb}} \times \boldsymbol{OH_{Sb}} + \sum_i (\boldsymbol{W_i} \times \boldsymbol{OH_i})} \qquad \textbf{Eq. 5}$$

Where:

CFM_i = airflow at speed *i*,

OH_i = operating hours at speed *i*, as specified in Table 3 of this appendix,

W_i = power consumption at speed *i*,

OH_{Sb} = operating hours in standby mode, as specified in Table 3 of this appendix, and

W_{Sb} = power consumption in standby mode.

Calculate two ceiling fan efficiencies for multi-mount ceiling fans: One efficiency corresponds to the ceiling fan mounted in the configuration associated with the definition of a hugger ceiling fan, and the other efficiency corresponds to the ceiling fan mounted in the configuration associated with the definition of a standard ceiling fan.

Table 3 to Appendix U to Subpart B of Part 430: Daily Operating Hours for Calculating Ceiling Fan Efficiency

Daily Operating Hours for LSSD and VSD Ceiling Fans**		
	No Standby	With Standby
High Speed	3.4	3.4
Low Speed	3.0	3.0
Standby Mode	0.0	17.6
Off Mode	17.6	0.0
Daily Operating Hours for HSSD Ceiling Fans		
	No Standby	With Standby
High Speed	12.0	12.0
Standby Mode	0.0	12.0
Off Mode	12.0	0.0
Daily Operating Hours for Large-Diameter Ceiling Fans		
	No Standby	With Standby
Active Mode*	12.0	12.0
Standby Mode	0.0	12.0
Off Mode	12.0	0.0

* The active mode hours must be apportioned equally across the number of active mode speeds tested (e.g., if four speeds are tested, 25% of the active mode hours are apportioned to each speed).

** These values apply only to VSD fans that also meet the definition of an LSSD fan.

4.3 Calculation of airflow and efficiency for multi-head ceiling fans:

Calculate airflow for each fan head using the method described in section 4.2 of this appendix. To calculate overall airflow at a given speed for a multi-head ceiling fan, sum the airflow for each fan head included in the ceiling fan (a single airflow can be applied to each of the identical fan heads, but at least one of each unique fan head must be tested). The power consumption is the measured power consumption with all fan heads on. Using the airflow as described in this section, and power consumption measurements from section 3.3 of this appendix, calculate ceiling fan efficiency for a multi-head ceiling fan as follows:

$$\boldsymbol{Ceiling\ Fan\ Efficiency\ (CFM/W)} = \frac{\sum_i (\boldsymbol{CFM_i} \times \boldsymbol{OH_i})}{\boldsymbol{W_{Sb}} \times \boldsymbol{OH_{Sb}} + \sum_i (\boldsymbol{W_i} \times \boldsymbol{OH_i})} \qquad \textbf{Eq. 6}$$

Where:

CFM_i = sum of airflows for each head at speed i,

OH_i = operating hours at speed i as specified in Table 3 of this appendix,

W_i = power consumption at speed i,

OH_{Sb} = operating hours in standby mode as specified in Table 3 of this appendix, and

W_{Sb} = power consumption in standby mode.

9. Section 430.32 is amended by:
    a. Revising the introductory text in paragraph (s)(2)(ii); and
    b. Adding paragraph (s)(2)(ii)(F).

The revisions and additions read as follows:

§430.32 Energy and water conservation standards and their compliance dates.

* * * * *

(s) * * *

(2) * * *

(ii) The standards described in paragraph (s)(2)(i) of this section apply to ceiling fans except:

* * * * *

(F) Ceiling fans with blade spans greater than 24 feet.

* * * * *

[FR Doc. 2019-20827 Filed: 9/27/2019 8:45 am; Publication Date: 9/30/2019]