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 itself 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. If this instruction is followed, 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 *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 *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 *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 *www.regulations.gov* provides after you have successfully uploaded your comment.

Submitting comments via email. Comments and documents submitted via email also will be posted to *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 in 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 each time you submit comments, data, documents, and other information to DOE. No faxes will be accepted.

Comments, data, and other information submitted to DOE electronically should be provided in PDF (preferred), Microsoft Word or Excel, or text (ASCII) file format. Provide documents that are not secured, that are written in English, and that are 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. Pursuant to 10 CFR 1004.11(e), (f), any person submitting information that he or she believes to be confidential and exempt by law from mandatory public disclosure should submit via email 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. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

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).

V. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of this notification of a webinar and availability of preliminary technical support document.

Signing Authority

This document of the Department of Energy was signed on February 7, 2022, by Kelly J. Speakes-Backman, Principal Deputy Assistant Secretary for Energy Efficiency and Renewable Energy, pursuant to delegated authority from the Secretary of Energy. That document with the original signature and date is maintained by DOE. For administrative purposes only, and in compliance with requirements of the Office of the Federal Register, the undersigned DOE Federal Register Liaison Officer has been authorized to sign and submit the document in electronic format for publication, as an official document of the Department of Energy. This administrative process in no way alters the legal effect of this document upon publication in the **Federal Register**.

Signed in Washington, DC, on February 17, 2022.

Treena V. Garrett,

Federal Register Liaison Officer, U.S. Department of Energy.

[FR Doc. 2022–03850 Filed 2–24–22; 8:45 am]

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DEPARTMENT OF ENERGY

10 CFR Part 431

[EERE–2019–BT–TP–0041]

RIN 1904–AE57

Energy Conservation Program: Test Procedure for Commercial Warm Air Furnaces

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

ACTION: Notice of proposed rulemaking and announcement of public meeting.

SUMMARY: The U.S. Department of Energy (''DOE'') proposes to amend the test procedures for commercial warm air furnaces (''CWAFs'') to incorporate the latest versions of the industry standards that are currently incorporated by reference. DOE also proposes to establish a new metric, Thermal Efficiency Two (''TE2''), and corresponding test procedure. Use of the newly proposed test procedure would become mandatory at such time as compliance with amended energy conservation standards based on TE2 is required, should DOE adopt such standards. DOE also proposes additional specifications for CWAFs with multiple vent hoods or small-diameter vent hoods. DOE is seeking comment from interested parties on the proposal.

DATES: DOE will accept comments, data, and information regarding this proposal no later than April 26, 2022. See section V, ''Public Participation,'' for details. DOE will hold a webinar on Tuesday, March 29, 2022, from 1:00 p.m. to 5:00 p.m. See section V, ''Public Participation,'' for webinar registration information, participant instructions, and information about the capabilities available to webinar participants. If no participants register for the webinar, it will be cancelled.

ADDRESSES: Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at *www.regulations.gov.* Follow the instructions for submitting comments. Alternatively, interested persons may submit comments, identified by docket

number EERE–2019–BT–TP–0041, by any of the following methods:

1. *Federal eRulemaking Portal: www.regulations.gov.* Follow the instructions for submitting comments.

2. *Email:* to *Furnaces2019TP0041@ee.doe.gov.* Include docket number EERE–2019–BT–TP–0041 in the subject line of the message.

No telefacsimiles (''faxes'') will be accepted. For detailed instructions on submitting comments and additional information on this process, see section V of this document.

Although DOE has routinely accepted public comment submissions through a variety of mechanisms, including postal mail and hand delivery/courier, the Department has found it necessary to make temporary modifications to the comment submission process in light of the ongoing coronavirus 2019 (''COVID–19'') pandemic. DOE is currently suspending receipt of public comments via postal mail and hand delivery/courier. If a commenter finds that this change poses an undue hardship, please contact Appliance Standards Program staff at (202) 586–1445 to discuss the need for alternative arrangements. Once the COVID–19 pandemic health emergency is resolved, DOE anticipates resuming all of its regular options for public comment submission, including postal mail and hand delivery/courier.

Docket: The docket, which includes **Federal Register** notices, public meeting attendee lists and transcripts (if a public meeting is held), comments, and other supporting documents/materials, is available for review at *www.regulations.gov.* All documents in the docket are listed in the *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 *www.regulations.gov/document?D=EERE-2019-BT-TP-0041-0001.* The docket web page contains instructions on how to access all documents, including public comments, in the docket. See section V for information on how to submit comments through *www.regulations.gov.*

FOR FURTHER INFORMATION CONTACT:

Ms. Julia Hegarty, 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: (240) 567–6737. Email: *ApplianceStandardsQuestions@ee.doe.gov.*

Ms. Amelia Whiting, U.S. Department of Energy, Office of the General Counsel, GC–33, 1000 Independence Avenue SW, Washington, DC 20585–0121. Telephone: (202) 586–2588. Email: *Amelia.Whiting@hq.doe.gov.*

For further information on how to submit a comment, review other public comments and the docket, or participate in a public meeting (if one is held), contact the Appliance and Equipment Standards Program staff at (202) 287–1445 or by email: *ApplianceStandardsQuestions@ee.doe.gov.*

SUPPLEMENTARY INFORMATION: DOE proposes to incorporate by reference the following industry standards into 10 CFR part 431:

American National Standards Institute (''ANSI'') Z21.47–2021, ''Gas-fired Central Furnaces'';

ANSI/The American Scociety of Mechanical Engineers (''ASME'') PTC 19.3–1974 (R2004), ''Part 3: Temperature Measurement, Instruments and Apparatus'';

ANSI/American Society of Heating, Refrigeration, and Air-conditioning Engineers (''ASHRAE'') Standard 103–2017, ''Method of Testing for Annual Fuel Utilization Efficiency of Residential Central Furnaces and Boilers'';

Copies of ANSI Z21.47–2021, ANSI/ASME PTC 19.3–1974 (R2004) and ANSI/ASHRAE 103–2017, can be obtained from American National Standards Institute, 25 W 43rd Street, 4th Floor, New York, NY 10036, (212) 642–4900, or online at: *webstore.ansi.org.*

Underwriters Laboratories (''UL'') standard UL 727–2018 ''Standard for Safety Oil-Fired Central Furnaces'';

Copies of UL 727–2018 can be obtained from Underwriters Laboratories, Inc., 2600 NW, Lake Rd., Camas, WA 98607–8542, (360) 817–5500 or online at: *standardscatalog.ul.com.*

ANSI/Air-Conditioning, Heating, and Refrigeration Institute (''AHRI'') 1500–2015 ''Performance Rating of Commercial Space Heating Boilers'';

Copies of AHRI 1500–2015 can be obtained from Air-Conditioning, Heating, and Refrigeration Institute, 2111 Wilson Blvd., Suite 500, Arlington, VA 22201, (703) 524–8800, or online at: *ahrinet.org.*

ANSI/ASTM E230/E230M–17 ''Standard Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples'';

ASTM D240–09 ''Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter'';

ASTM D396–14a ''Standard Specification for Fuel Oils'';

ASTM D4809–09a ''Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter (Precision Method)'';

ASTM D5291–10 ''Standard Test Methods for Instrumental Determination of Carbon, Hydrogen, and Nitrogen in Petroleum Products and Lubricants'';

Copies of ANSI/ASTM E230/E230M–17, ASTM D240–09, ASTM D396–14a, ASTM D4809–09a, and ASTM D5291–10, and can be obtained from ASTM, International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428, (877) 909–2786 or by going online at: *www.astm.org.*

National Fire Protection Association (''NFPA'') 97–2003 ''Standard Glossary of Terms Relating to Chimneys, Vents, and Heat-Producing Appliances''.

Copies of NFPA 97–2003 can be obtained from National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169–7471, (617) 770–3000 or by going online at: *www.nfpa.org.*

For a further discussion of these standards, see section IV.M of this document.

Table of Contents

I. Authority and Background

CWAFs are included in the list of ''covered equipment'' for which DOE is authorized to establish and amend energy conservation standards and test procedures. (42 U.S.C. 6311(1)(J)) DOE's energy conservation standards and test procedures for CWAFs are currently prescribed at subpart D of part 431 of title 10 of the Code of Federal Regulations (''CFR''). The following sections discuss DOE's authority to establish test procedures for CWAFs and relevant background information regarding DOE's consideration of test procedures for this equipment.

A. Authority

The Energy Policy and Conservation Act, as amended (''EPCA''),[1] 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 C [2] of EPCA, added by Public Law 95–619, Title IV, section 441(a), established the Energy Conservation Program for Certain Industrial Equipment, which sets forth a variety of provisions designed to improve energy efficiency. (42 U.S.C. 6311–6317) This equipment includes CWAFs, the subject of this document. (42 U.S.C. 6311(1)(J))

The energy conservation program under EPCA 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. 6311), test procedures (42 U.S.C. 6314), labeling provisions (42 U.S.C. 6315), energy conservation standards (42 U.S.C. 6313), and the authority to require information and reports from manufacturers (42 U.S.C. 6316; 42 U.S.C. 6296).

The Federal testing requirements consist of test procedures that manufacturers of covered equipment must use as the basis for: (1) Certifying to DOE that their equipment complies with the applicable energy conservation standards adopted pursuant to EPCA (42 U.S.C. 6316(b); 42 U.S.C. 6296), and (2) making representations about the efficiency of that equipment (42 U.S.C. 6314(d)). Similarly, DOE uses these test procedures to determine whether the equipment complies with relevant standards promulgated under EPCA.

Federal energy efficiency requirements for covered equipment established under EPCA generally supersede State laws and regulations concerning energy conservation testing, labeling, and standards. (42 U.S.C. 6316(a) and (b); 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); 42 U.S.C. 6297(d))

Under 42 U.S.C. 6314, EPCA sets forth the criteria and procedures DOE must follow when prescribing or amending test procedures for covered equipment. EPCA requires that any test procedures prescribed or amended under this section must be reasonably designed to produce test results which reflect energy efficiency, energy use or estimated annual operating cost of a given type of covered equipment during a representative average use cycle and requires that test procedures not be unduly burdensome to conduct. (42 U.S.C. 6314(a)(2))

EPCA requires that the test procedure for CWAFs be those generally accepted industry testing procedures developed or recognized by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) or by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), as referenced in ASHRAE Standard 90.1. (42 U.S.C. 6314(a)(4)(A)) Further, if such industry test procedure is amended, DOE must amend its test procedure to be consistent with the amended industry test procedure, unless DOE determines, by rule published in the **Federal Register** and supported by clear and convincing evidence, that such amended test procedure would not meet the requirements in 42 U.S.C. 6314(a)(2) and (3) related to representative use and test burden, in which case DOE may establish an amended test procedure that does satisfy those statutory provisions. (42 U.S.C. 6314(a)(4)(B) and (C))

EPCA also requires that, at least once every 7 years, DOE evaluate test procedures for each type of covered equipment, including CWAF, 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. (42 U.S.C. 6314(a)(1))

If the Secretary determines that a test procedure amendment is warranted, the Secretary must publish proposed test procedures in the **Federal Register** and afford interested persons an opportunity (of not less than 45 days' duration) to present oral and written data, views, and arguments on the proposed test procedures. (42 U.S.C. 6314(b)) If DOE determines that test procedure revisions are not appropriate, DOE must publish its determination not to amend the test procedures. DOE is publishing this notice of proposed rulemaking (''NOPR'') in satisfaction of the 7-year review requirement specified in EPCA. (42 U.S.C. 6314(a)(1)(A)(ii))

B. Background

DOE's current test procedure for CWAFs is codified at 10 CFR 431.76, ''Uniform test method for the measurement of energy efficiency of commercial warm air furnaces.'' The currently applicable test procedure incorporates by reference two industry standards for testing gas-fired CWAFs: American National Standards Institute (''ANSI'') Z21.47–2012, ''Standard for Gas-fired Central Furnaces'' (''ANSI Z21.47–2012''), which is used for all types of gas-fired CWAFs; and ANSI/American Society of Heating, Refrigeration, and Air-conditioning Engineers (''ASHRAE'') Standard 103–2007, ''Method of Testing for Annual Fuel Utilization Efficiency of Residential Central Furnaces and Boilers'' (''ANSI/ASHRAE 103–2007''), which is specifically used for testing condensing gas-fired CWAFs. 10 CFR

[1] All references to EPCA in this document refer to the statute as amended through the Infrastructure Investment and Jobs Act, Public Law 117–58 (Nov. 15, 2021).

[2] For editorial reasons, upon codification in the U.S. Code, Part C was redesignated Part A–1.

431.76 (c)(1), (d)(2), (e)(1), and (f)(1);10 CFR 431.75(b)(1) and (c)(1). The current test procedure also incorporates by reference two industry standards for testing oil-fired CWAFs: Hydronics Institute Division of AHRI (''HI'') BTS–2000 Rev 06.07, ''Method to Determine Efficiency of Commercial Space Heating Boilers'' (''HI BTS–2000'') [3] and Underwriters Laboratories (''UL'') UL 727–2006, ''Standard for Safety Oil-Fired Central Furnaces'' (''UL 727–2006'').[4] 10 CFR 431.76(c)(2), (d)(1), and (e)(2); 10 CFR 471.75(d)(1) and (e)(2).

DOE most recently amended the test procedure for CWAFs in a final rule published on July 17, 2015, which updated the test procedure for gas-fired CWAFs to incorporate by reference the latest versions of the industry standards available at the time (*i.e.,* ANSI Z21.47–2012 and ANSI/ASHRAE 103–2007). 80 FR 42614 (''July 2015 final rule''). At the time of the July 2015 final rule, UL 727–2006 and HI BTS–2000 were still the most recent versions of those industry standards.

On May 5, 2020, DOE published a request for information (''RFI'') soliciting public comments, data, and information on aspects of the existing DOE test procedure for CWAFs, including whether there are any issues with the current test procedure and whether it is in need of updates or revisions. 85 FR 26626 (''May 2020 RFI'').

DOE received comments in response to the May 2020 RFI from the interested parties listed in Table I.1.

TABLE I.1—WRITTEN COMMENTS RECEIVED IN RESPONSE TO THE MAY 2020 RFI

Commenter(s)	Reference in this NOPR	Commenter type
Appliance Standards Awareness Project	ASAP	Efficiency Organization.
Northwest Energy Efficiency Alliance	NEEA	Efficiency Organization.
Pacific Gas and Electric Company, Southern California Gas Company, Southern California Edison, and San Diego Gas and Electric Company (collectively, the ''California Investor-Owned Utilities'').	CA IOUs	Utility Organization.
Air-Conditioning, Heating, and Refrigeration Institute	AHRI	Trade Association.
American Public Gas Association	APGA	Trade Association.
Carrier Corporation	Carrier	Manufacturer.
Trane Technologies	Trane	Manufacturer.

A parenthetical reference at the end of a comment quotation or paraphrase provides the location of the item in the public record.[5]

C. Deviation From Appendix A

In accordance with section 3(a) of 10 CFR part 430, subpart C, appendix A (''appendix A''), DOE notes that it is deviating from the provision in appendix A regarding the pre-NOPR stages for a test procedure rulemaking. *See* 86 FR 70892 (Dec. 13, 2021) (effective January 12, 2022). Section 8(b) of appendix A states if DOE determines that it is appropriate to continue the test procedure rulemaking after the early assessment process, it will provide further opportunities for early public input through **Federal Register** documents, including notices of data availability and/or RFIs. DOE is opting to deviate from this provision due to the substantial feedback and information supplied by commenters in response to the May 2020 RFI.

As discussed in section I.B of this NOPR, the May 2020 RFI requested submission of such comments, data, and information pertinent to test procedures for CWAFs. In response to the May 2020 RFI, stakeholders provided substantial comments and information, which DOE has found sufficient to identify the need to modify the test procedures for CWAFs. Section III of this NOPR discusses in detail the comments received and how early stakeholder feedback has been considered in forming DOE's proposals to amend the CWAF test procedure.

II. Synopsis of the Notice of Proposed Rulemaking

In this NOPR, DOE proposes to update its test procedures for CWAFs as follows:

(1) Reorganize the setup and testing provisions in 10 CFR 431.76 related to the determination of thermal efficiency into the newly established 10 CFR part 431, subpart D, appendix A (''appendix A'');

(2) Incorporate by reference the most recent versions of the currently referenced industry standards:

- UL 727–2018 (previously UL 727–2006) for testing oil-fired CWAFs;
- AHRI 1500–2015 (previously HI BTS–2000) for performing fuel oil analysis and for calculating flue loss of oil-fired CWAFs;
- ANSI Z21.47–2021 (previously ANSI Z21.47–2012) for testing gas-fired CWAFs; and
- ANSI/ASHRAE 103–2017 (previously ANSI/ASHRAE 103–2007) for testing condensing gas-fired CWAFs;

(3) Incorporate by reference the standards referenced in UL 727–2018 (*i.e.,* NFPA 97–2003), AHRI 1500–2015 (*i.e.,* ASTM D396–14a, ASTM D240–09, ASTM D4809–09a, and ASTM D5291–10), and ANSI Z21.47–2021 (*i.e.,* ANSI/ASME PTC 19.3–1974 (R2004)) that are necessary for performing the DOE test procedure;

(4) Clarify how to test units with multiple vent hoods, and units with vent hoods that are 2 inches or smaller in diameter; and

(5) Establish a new test procedure at 10 CFR part 431, subpart D, appendix B (''appendix B''), which would generally require testing as in appendix A, but which would establish a new metric, ''TE2.'' The new TE2 metric would account for jacket losses and part-load operation in addition to accounting for flue losses. If adopted, manufacturers could use proposed new appendix B to make voluntary representations of TE2; this proposed test procedure would become mandatory at such time as compliance is required with amended energy conservation standards based on TE2, should DOE adopt such standards.

[3] DOE determined that UL 727–1994 did not provide a procedure for calculating the percent flue loss of the furnace, which is necessary in calculating the thermal efficiency, and therefore incorporated by reference provisions from HI BTS–2000 to calculate the flue loss for oil-fired CWAFs. 69 FR 61916, 61917, 61940 (Oct. 21, 2004).

[4] UL 727–1994 is also incorporated by reference in 10 CFR 431.75, but is no longer referenced in the test method specified in 10 CFR 431.76, which references only UL 727–2006.

[5] The parenthetical reference provides a reference for information located in the docket of DOE's rulemaking to develop test procedures for CWAFs. (Docket No. EERE–2019–BT–TP–0041, which is maintained at *www.regulations.gov*). The references are arranged as follows: (Commenter name, comment docket ID number, page of that document).

DOE's proposed actions are summarized in Table II.1 compared to the current test procedure as well as the reason for the proposed change.

TABLE II.1—SUMMARY OF CHANGES IN PROPOSED TEST PROCEDURES RELATIVE TO CURRENT TEST PROCEDURE

Current DOE test procedure	Proposed test procedures	Applicable test procedure	Attribution
References UL 727–2006 for testing oil-fired CWAFs.	Incorporate by reference UL 727–2018 for testing oil-fired CWAFs, and the standards referenced in UL 727–2018 that are necessary in performing the DOE test procedure (*i.e.,* NFPA 97–2003).	Appendix A and appendix B.	Align with industry standard update.
References HI BTS–2000 for performing fuel oil analysis and for calculating flue loss of oil-fired CWAFs.	Incorporate by reference AHRI 1500–2015 for performing fuel oil analysis and for calculating flue loss of oil-fired CWAFs and the standards referenced in AHRI 1500–2015 that are necessary in performing the DOE test procedure (*i.e.,* ASTM D396–14a, ASTM D240–09, ASTM D4809–09a, and ASTM D5291–10).	Appendix A and appendix B.	Align with industry standard update.
References ANSI Z21.47–2012 for testing gas-fired CWAFs.	Incorporate by reference ANSI Z21.47–2021 for testing gas-fired CWAFs, and the standards referenced in ANSI Z21.47–2021 that are necessary in performing the DOE test procedure (*i.e.,* ANSI/ASME PTC 19.3–1974 (R2004)).	Appendix A and appendix B.	Align with industry standard update.
References ANSI/ASHRAE 103–2007 for testing condensing gas-fired CWAFs.	Incorporate by reference ANSI/ASHRAE 103–2017 for testing condensing gas-fired CWAFs.	Appendix A and appendix B.	Align with industry standard update.
Does not specify how to test units with multiple vent hoods.	Adds specifications for units with multiple vent hoods. Measurements made in each vent hood shall be averaged or adjusted using a weighted average, depending on the flue hood face area.	Appendix A and appendix B.	Additional specification to improve consistency and repeatability in testing.
Does not specify how to test units with vent hoods that are too small to fit nine thermocouples.	Adds specifications to address units with small-diameter vent hoods. Units with vent hoods that are 2 inches or smaller in diameter may optionally use 5 thermocouples.	Appendix A and appendix B.	Additional specification to improve consistency and repeatability in testing.
Efficiency metric (TE) only accounts for flue losses and does not account for jacket losses or part-load operation.	Establishes a new metric (TE2) that accounts for flue losses, jacket losses, and part-load operation.	Appendix B	Improve representativeness.

DOE has tentatively determined that the proposed amendments for the test procedure at appendix A described in section III of this document would not alter the measured efficiency of CWAFs, that the proposed test procedures would not be unduly burdensome to conduct, and that the proposed test procedures more accurately produce test results that reflect energy efficiency, energy use, and estimated operating costs of CWAFs during a representative average use cycle.

The additional proposed amendments for the newly proposed appendix B would alter the reported efficiency of CWAFs, as discussed in the relevant section of this document. However, as proposed, testing in accordance with these specific proposed changes would not be required until such time as compliance is required with any amended energy conservation standards based on appendix B.

Discussion of DOE's proposed actions are discussed in detail in section III of this document.

III. Discussion

In the following sections, DOE describes the proposed amendments to the test procedures for CWAFs. DOE seeks input from the public to assist with its consideration of the proposed amendments presented in this document. In addition, DOE welcomes comments on other relevant issues that may not specifically be identified in this document.

A. Scope of Applicability

This rulemaking applies to CWAFs. EPCA defines ''warm air furnace'' as a self-contained oil-fired or gas-fired furnace designed to supply heated air through ducts to spaces that require it and includes combination warm air furnace/electric air conditioning units, but does not include unit heaters and duct furnaces. (42 U.S.C. 6311(11)(A)) DOE codified the statutory definition of ''warm air furnace'' at 10 CFR 431.72. DOE defines a CWAF as a warm air furnace that is industrial equipment, and that has a capacity (rated maximum input) of 225,000 British thermal units (''Btu'') per hour or more. 10 CFR 431.72.

DOE did not receive any comments in response to the May 2020 RFI related to the scope of the CWAF test procedure or relevant definitions for CWAFs. DOE is not proposing any changes to the scope of equipment covered by its CWAF test procedures, or to the relevant definitions.

B. Updates to Industry Standards

As discussed, DOE currently incorporates by reference in 10 CFR part 431, subpart D, the following industry test procedures: UL 727–2006, HI–BTS 2000, ANSI Z21.47–2012, and ANSI/ASHRAE Standard 103–2007. Updates of each of these test standards have been published since they were incorporated into the current test procedure. These updated test standards are UL 727–2018 (update to UL 727–2006), AHRI 1500–2015 (update to HI–BTS 2000), ANSI Z21.47–2021 [6] (update to ANSI Z21.47–2016), and ANSI/ASHRAE Standard 103–2017 (update to ANSI/ASHRAE Standard 103–2007).

In the May 2020 RFI, DOE noted several differences between the industry standards currently incorporated by reference and the updated industry standards and sought comment on these changes. 85 FR 26626, 26629–26631. Each change in the updated versions of

[6] At the time of the May 2020 RFI publication, ANSI Z21.47–2016 was the most up-to-date version of ANSI Z21.47. Since then, ANSI Z21.47–2021 was published.

each standard and stakeholder comments in response to the May 2020 RFI are discussed in the following sections. DOE did not identify any substantive differences between the currently referenced industry standards and their updated versions that would pertain to the DOE test procedure for CWAFs, other than those discussed in the following sections. In response to the updates to the relevant industry standards, DOE is proposing to amend the Federal test procedure for CWAFs to incorporate by reference in 10 CFR part 431, subpart D, the following updated industry standards: UL 727–2018, AHRI 1500–2015, ANSI Z21.47–2021, and ANSI/ASHRAE 103–2017.

As discussed, the DOE test procedure for CWAFs is specified in 10 CFR 431.76. In this NOPR, DOE is proposing to establish appendix A to subpart D of 10 CFR part 431. DOE is reorganizing the CWAF setup and testing provisions currently proscribed in 10 CFR 431.76 into appendix A to clarify the test provisions that are necessary for determining thermal efficiency. DOE is reorganizing 10 CFR 431.76 in the way because, as discussed in section III.C of this document, DOE is also establishing appendix B for determining the proposed thermal efficiency two metric. DOE has tentatively determined that creating separate appendixes for the determination of the two different metrics would help clarify which appendix corresponds to which metric (*i.e.,* appendix A is for thermal efficiency, while appendix B is for thermal efficiency two). Therefore, the establishment of appendix A is editorial and for reorganization purposes, and appendix A does not deviate from the current DOE test procedure unless specifically discussed in the sections below and in section III.E of this document.

1. UL 727–2006

The CWAF test procedure at 10 CFR 431.76 requires use of those procedures contained in UL 727–2006 that are relevant to the steady-state efficiency measurement (*i.e.,* UL 727–2006 sections 1 through 3; 37 through 42 (except for sections 40.4 and 40.6.2 through 40.6.7); 43.2; and 44 through 46). In the May 2020 RFI, DOE identified two updates in UL 727–2018 relating to the scope and to thermocouple tolerance. 85 FR 26626, 26629–26630. In addition, since the publication of the May 2020 RFI, DOE has identified one additional update in UL 727–2018 related to the definitions incorporated in section 3 of UL 727–2018. These updates, the comments received from stakeholders regarding these updates, and DOE's proposal for each update are discussed in detail in the following sections. As previously mentioned in section III.B of this document, DOE is proposing to amend the DOE test procedure to incorporate by reference UL 727–2018.

a. Scope of UL 727

In the May 2020 RFI, DOE noted that the language in section 1 of the UL 727–2018 test standard regarding the scope of the standard has been changed from that in UL 727–2006. 85 FR 26626, 26630. Section 1.3 in UL 727–2006 references the NFPA ''Standard for Installation of Oil-Burning Equipment,'' NFPA 31, and codes such as the ''Building Officials Code Administrators International National Mechanical Code,'' the ''State Building Code Council Standard Mechanical Code,'' and the ''International Association of Plumbing and Mechanical Officials Uniform Mechanical Code'' for requirements for the installation and use of oil-burning equipment. In contrast, Section 1.3 of UL 727–2018 references the NFPA ''Standard for Installation of Oil-Burning Equipment,'' NFPA 31, the ''International Mechanical Code,'' and the ''Uniform Mechanical Code'' regarding installation and use of oil-burning equipment.

In the May 2020 RFI, DOE explained that DOE defines the scope for the testing of CWAFs in 10 CFR 431.76(a), and that the scope of applicability of the DOE test procedure is independent from the scope defined by UL–727–2006. 85 FR 26626, 26630. Although DOE references the scope of UL 727–2006 in its test provisions at 10 CFR 431.76(c)(2), only the procedures within UL 727–2006 that are pertinent to the measurement of the steady-state efficiency are included in the DOE test procedure. 10 CFR 431.76(b). Therefore, any provisions within the scope of UL 727–2006 that do not relate to the measurement of the steady-state efficiency do not apply to the DOE test procedure.

In the May 2020 RFI, DOE sought comment on whether there is a need to identify more specifically the provisions of UL 727–2006 that apply to the DOE test procedure. *Id.* In response, AHRI recommended the adoption of the most current edition of UL 727 published in 2018 and stated that it does not believe there is a need to identify provisions from the 2006 edition in the DOE test procedure. (AHRI, No. 7 at p. 3)

DOE has tentatively determined that the scope section of UL 727–2018 is inapplicable to the DOE test procedure because the scope of the DOE test procedure is defined separately in 10 CFR 431.76(a), and only the provisions in UL 727–2018 that relate to the measurement of steady-state efficiency apply to the DOE test procedure. While DOE is proposing to incorporate by reference UL 727–2018 in its entirety, DOE is proposing to explicitly identify the provisions of UL 727–2018 that are applicable to the DOE test procedure for CWAF, which would not include the scope section of that industry standard, since the scope of the DOE test procedure is defined separately in 10 CFR 431.76(a).

b. Thermocouple Tolerance

The DOE test procedure currently incorporates Section 40 of UL 727–2006 for the test set-up for oil-fired commercial warm air furnaces. 10 CFR 431.76(c)(2). In the May 2020 RFI, DOE noted that Section 40.6.1 of UL 727–2018, which pertains to temperature measurements using potentiometers and thermocouples, has different language from UL 727–2006 and incorporates different ANSI references. 85 FR 26626, 26629–26630. Specifically, UL 727–2006 specifies that the thermocouple wire must conform to the requirements specified in the Initial Calibration Tolerances for Thermocouples table (*i.e.,* Table 8) in International Society of Automation (''ISA'') standard MC96.1, ''Temperature-Measurement Thermocouples'' (''ANSI/ISA MC96.1''). In contrast, UL 727–2018 states that the thermocouple wire must conform to the requirements specified in the Tolerance on Initial Values of Electromagnetic Force (''EMF'') Versus Temperature tables (*i.e.,* Tables 1–3) in ANSI/ASTM E230/E230M–17 ''Standard Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples,'' (''ASTM E230/E230M–17''). The thermocouple specifications in ANSI/ISA MC96.1 and ANSI/ASTM E230/E230M–17 are applicable only to the range of temperatures associated with the types of thermocouples specified in each of the industry standards. As discussed in the May 2020 RFI, based on an initial review of ANSI/ASTM E230/E230M–17, the temperature ranges to which the ANSI/ASTM E230/E230M–17 specifications apply differ from the temperature ranges specified in MC96.1 for certain thermocouple wires. Specifically, ANSI/ASTM E230/E230M–17 includes temperature ranges and specifications for thermocouple types C, N, and mineral-insulated metal-sheathed E type, which are not included in ANSI/ISA MC96.1; and tolerances on initial values of EMF versus temperature for extension wires and compensating extension wires in ANSI/ASTM E230/

E230M–17 (*i.e.,* Tables 2 and 3) have been added to Section 40.6.1 of UL 727–2018. *Id.* at 85 FR 26630.

In the May 2020 RFI, DOE asked for comment regarding the changes resulting from UL 727–2018 referencing ANSI/ASTM E230/E230M–17. Specifically, DOE asked for comment on whether the additional references and changes to the thermocouple and thermocouple extension wire requirements would impact the representativeness of the measured test results or test burden of the DOE CWAF test procedure, if adopted. *Id.* DOE also sought comment on why Section 40.6.1 in UL 727 was changed from referencing ANSI/ISA MC96.1 in UL 727–2006, to ANSI/ASTM E230/E230M in UL 727–2018. DOE requested input on the perceived benefits and/or drawbacks of such change. 85 FR 26626, 26630.

AHRI encouraged DOE to evaluate how any additions or changes to the thermocouple and thermocouple extension wire requirements to determine the full impact any differences may have on current products' ability to remain compliant. (AHRI, No. 7 at p. 2) AHRI also commented that ANSI/ISA MC96.1 is an obsolete standard that was last published in 1982 and was administratively withdrawn by ISA in 2011. Additionally, AHRI stated that the ANSI/ASTM E230/E230M–17 standard represents current technologies and is maintained on a periodic basis in accordance with the ASTM standards development procedures. (AHRI, No. 7 at pp. 2–3)

DOE has confirmed that ANSI/ISA MC96.1 was administratively withdrawn by ISA. As the ANSI/ASTM E230/E230M–17 standard is the current industry standard regarding thermocouples, it is expected that thermocouples currently being used for testing meet the specifications of that industry standard. Furthermore, DOE notes that the requirements in ANSI/ASTM E230/E230M–17 allow additional thermocouple wires for testing, in addition to those that were specified in ANSI/ISA MC96.1. Therefore, DOE expects units tested according to the previous requirements in ANSI/ISA MC96.1 would subsequently meet those in ANSI/ASTM E230/E230M–17. DOE received no additional comments on this topic. Absent data and information to indicate that the requirements in ANSI/ASTM E230/E230M–17 are not appropriate or result in a significant change from the provisions in ANSI/ISA MC96.1. DOE has tentatively determined that there is not sufficient evidence to indicate ANSI/ASTME230/E230M–17 would not meet the requirements in 42 U.S.C. 6314(a)(2) and (3), related to representative use and test burden. Additionally, if DOE were to continue to reference a test procedure that is administratively withdrawn, industry may find it difficult to obtain copies of the obsolete standard. Therefore, DOE is proposing to incorporate the ANSI/ASTM E230/E230M–17 thermocouple provisions referenced in UL 727–2018 (*i.e.,* Tables 1–3 of ANSI/ASTM E230/E230M–17) in the DOE test procedure for CWAFs.

c. NFPA 97–2003

Sections 3.11 and 3.27 of UL 727–2018 state that the definitions of terms ''combustible'' and ''noncombustible'' are the definitions found within NFPA 97M, ''Standard Glossary of Terms Relating to Chimneys, Gas Vents and Heat Producing Appliances'' (''NFPA 97M''). UL 727–2018 does not specify which version of NFPA 97M is being referenced in the standard, nor does it include a publication date of version number of the NFPA 97M standard. The latest version of NFPA 97M of which DOE is aware is a version published in 1967. DOE also notes that NFPA's website does not contain a NFPA 97M publication, and instead contains NFPA 97–2003 ''Standard Glossary of Terms Relating to Chimneys, Vents, and Heat-Producing Appliances'' (NFPA 97–2003). NFPA 97–2003 contains definitions for ''combustible material'' and ''noncombustible material,'' however NFPA 97M only contains a definition for ''combustible material.'' DOE notes that there are minor differences between the definitions for ''combustible material'' in both standards, and that DOE tentatively concludes that there are no substantial differences.[7] Further, DOE has tentatively concluded that UL 727–2018 references an outdated standard (NFPA 97M) and should instead reference the most up-to-date industry standard (NFPA 97–2003). Therefore, DOE is proposing to incorporate by reference NFPA 97–2003, and is proposing that the references to NFPA 97M that are relevant to the DOE test procedure (*i.e.,* those made within Sections 3.11 and 3.27 of UL 727–2018) shall instead reference NFPA 97–2003.

DOE seeks comment on its tentative conclusion that NFPA 97M is an outdated standard that has been superseded by NFPA 97–2003. DOE seeks comment on its proposal to incorporate by reference NFPA 97–2003 in 10 CFR part 431, subpart D.

2. HI BTS–2000

DOE's test procedure for oil-fired CWAFs references sections of HI BTS–2000 that are relevant to fuel oil analysis and calculating percent flue loss (*i.e.,* HI BTS–2000 sections 8.2.2, 11.1.4, 11.1.5, and 11.1.6.2). 10 CFR 431.76(c)(2) and (e)(2). DOE's test procedure includes these provisions because DOE has previously determined that UL 727 does not provide a procedure for calculating the percent flue loss of the furnace, which is necessary in calculating the thermal efficiency (''TE''), and therefore incorporated by reference provisions from HI BTS–2000 to calculate the flue loss for oil-fired CWAFs. 69 FR 61916, 61917, 61940.

In 2015, HI BTS–2000 was redesignated by AHRI as AHRI 1500–2015. In the May 2020 RFI, DOE identified two substantive changes in the sections relevant to the DOE test procedure in the update from HI BTS–2000 to AHRI 1500–2015 regarding fuel oil analysis and calculation of flue loss. 85 FR 26626, 26630. DOE requested comment generally regarding whether any of the differences between Sections 8.2.2, 11.1.4, 11.1.5, and 11.1.6.2 of HI BTS–2000 and AHRI 1500–2015 are relevant to the DOE test procedure, and if so, how such differences would impact the representativeness of measurements and the associated test burden of the DOE commercial warm air furnaces test procedure, if adopted. *Id.* at 85 FR 26631. The updates to AHRI 1500–2015, the comments received from stakeholders regarding these updates, and DOE's proposal for each update are discussed in detail in the following paragraphs. As previously mentioned in section III.B of this document, DOE is proposing to amend the DOE test procedure to incorporate by reference AHRI 1500–2015.

a. Fuel Oil Analysis Requirements

DOE's test procedure for oil-fired CWAFs includes fuel oil analysis requirements that reference Section 8.2.2 of HI BTS–2000. 10 CFR 431.76(c)(2). As noted in the May 2020 RFI, Section C3.2.1.1 of AHRI 1500–2015 (previously Section 8.2.2 of HI BTS–2000) specifies different fuel oil

[7] NFPA 97–2003 defines ''combustible material'' as ''material made of or surfaced with wood, compressed paper, plant fiber, plastics, or other material that can ignite and burn, whether flameproofed or not, or whether plastered or unplastered.'' (Section 3.3.44 of NFPA 97–2003) NFPA 97M defines ''combustible material'' as ''combustible material, as pertaining to materials adjacent to or in contact with heat-producing appliances, chimney connectors and vent connectors, steam and hot-water pipes, and warm-air ducts, means material made of or surfaced with wood, compressed paper, plant fibers, or other materials that will ignite and burn. Such material shall be considered as combustible even though flameproofed, fire-retardant treated, or plastered.'' (NFPA 97M, part II, p. 193)

analysis requirements (*i.e.,* heating value analyzed per ASTM D240–09 [8] or ASTM D4809–09a,[9] hydrogen and carbon content analyzed per ASTM D5291–10,[10] and density and American Petroleum Institute (''API'') gravity analyzed per ASTM D396–14a [11]) than are required in Section 8.2.2 of HI BTS–2000 (*i.e.,* heat value, hydrogen and carbon content, density and API gravity analyzed per ASTM D396–90 [12]). 85 FR 26626, 26631.

In the May 2020 RFI, DOE asked for comment regarding the differences between the fuel oil analysis requirements in each standard, whether the differences between the two would yield different results during testing, and whether adopting AHRI 1500–2015 would add or reduce burden to the current testing requirements of the DOE test procedure. 85 FR 26626, 26631.

The CA IOUs encouraged DOE to ensure that fuel oil analysis requirements are consistent across applicable test procedures. (CA IOUs, No. 8 at p. 4) AHRI stated that the two standards show no significant changes and that adoption of AHRI 1500–2015 would not yield different results during testing. AHRI reiterated its support for the adoption of the most current edition of this standard, stating that this edition represents the most current technology and information available at the time of publication, and that HI BTS–2000 is an obsolete standard no longer maintained by AHRI. Furthermore, AHRI stated that it has determined that there is no change in the burden by adopting AHRI 1500–2015. (AHRI, No. 7 at p. 4)

DOE has not received any information or data indicating that updating the HI BTS–2000 reference to AHRI 1500–2015 would result in a test procedure that would not meet the representativeness requirements or be unduly burdensome to conduct. DOE has confirmed that HI BTS–2000 is no longer maintained by AHRI and has tentatively determined that it is an obsolete standard. AHRI 1500–2015 represents the industry's most up to date requirements for fuel oil analysis, and no issues or differences between the new and old standards that would impact results or require retesting have been reported to DOE. Because of this, and based on stakeholder comment, DOE has tentatively determined that incorporating AHRI 1500–2015 into the DOE test procedure would not impact the performance of a CWAF under test or require CWAFs to be retested. Additionally, if DOE were to continue to reference a test procedure that is administratively withdrawn, industry may find it difficult to obtain copies of the obsolete standard. Therefore, DOE has tentatively determined that AHRI 1500–2015, the successor industry standard to the currently referenced HI BTS–2000, contains fuel oil analysis requirements that are equivalent to the requirements in HI BTS–2000 and are currently being used by test facilities. Therefore, DOE is proposing to incorporate by reference AHRI 1500–2015, including its fuel oil analysis specifications.

b. Calculation of Carbon Dioxide in Flue Gas Losses

In the May 2020 RFI, DOE noted that Section 11.1.4 of HI BTS–2000 requires that the carbon dioxide (''CO_2'') value used in the calculation of the dry flue gas loss for oil must be the measured CO_2. 85 FR 26626, 26631. Section C7.2.4 of AHRI 1500–2015 (previously Section 11.1.4 in HI BTS–2000) includes the option to calculate CO_2 using the measured oxygen (''O_2'') value instead of directly measuring the CO_2 value. The DOE test procedure at 10 CFR 431.76(d) requires that CO_2 must be measured.

In the May 2020 RFI, DOE asked for comment on whether the option to calculate CO_2 in AHRI 1500–2015 yields different testing results compared to using the measured value, and whether it should adopt the AHRI 1500–2015 provisions that allow for measuring O_2 and calculating CO_2. *Id.* The CA IOUs stated that measuring CO_2 levels is more accurate than calculating CO_2 levels based on O_2 measurements. The CA IOUs also stated that since certified labs and manufacturers are already equipped to measure CO_2, DOE should maintain the current requirement for direct CO_2 measurements. (CA IOUs, No. 8 at p. 4) AHRI recommended that the option to calculate CO_2 based on a measurement of O_2 be added to the DOE test method. AHRI stated that using a calculated CO_2 yields comparable results and is equivalent using a measured CO_2 value. (AHRI, No. 7 at p. 4)

DOE has identified O_2 sensors on the market that are accurate to within ±0.1 percent, which is equivalent to or greater than the accuracy of the CO_2 sensors used in labs that perform CWAF testing. Therefore, if such O_2 sensors are used to measure O_2 as a means for calculating CO_2, the value of CO_2 obtained through calculation and the value obtained through direct measurement should be comparable. DOE also consulted with independent third-party testing facilities and found that some of these facilities currently use sensors that measure O_2 in the flue gasses and perform an internal calculation to determine CO_2 in the flue gasses. In addition, AHRI 1500–2015 includes the option to directly measure CO_2, so if that option is less burdensome, test facilities would continue to be able to rely on it. DOE has tentatively determined that calculating CO_2 using a measured O_2 value, as specified in AHRI 1500–2015, would provide results equivalent to the CO_2 measurement currently required by the DOE test method, and that allowing a calculated value of CO_2 would harmonize with the latest industry standard without increasing test burden. For these reasons, DOE proposes to incorporate by reference the provisions in AHRI 1500–2015 that provide an optional procedure for measuring CO_2 based on measured O_2 values. DOE also proposes to establish section 3 of appendix A (*i.e.,* an update of 10 CFR 431.76(d) of the current DOE test procedure) to reflect DOE's proposal to allow measuring O_2, and this includes requiring that O_2 measurements are determined with an instrument that has a reading error no greater than ±0.1 percent. DOE notes that Table C1 of AHRI 1500–2017 specifies that O_2 shall be measured with an accuracy no greater than ±0.1 percent, and therefore this proposal aligns with the requirements in the industry standard.

DOE seeks comment on its proposal to adopt the optional method specified in AHRI 1500–2015 that allows for calculating CO_2 using a measured O_2 value. DOE also seeks comment on its proposal to establish section 3 of appendix A (*i.e.,* an update of 10 CFR 431.76(d) of the current DOE test procedure) to accommodate the option to calculate CO_2 using a measured O_2 value.

3. ANSI Z21.47

In the May 2020 RFI, DOE noted that the test method in 10 CFR 431.76 for gas-fired CWAFs requires the use of procedures contained in ANSI Z21.47–2012 that are relevant to the steady-state efficiency measurement (*i.e.,* Sections 1.1, 2.1 through 2.6, 2.39, and 4.2.1 of ANSI Z21.47–2012). 81 FR 26626, 26630. DOE noted that the majority of the test standard provisions relevant to

[8] ASTM D240–09 ''Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter'' (''ASTM D240–09'').

[9] ASTM D4809–09a ''Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter (Precision Method)'' (''ASTM D4809–09a'').

[10] ASTM D5291–10 ''Standard Test Methods for Instrumental Determination of Carbon, Hydrogen, and Nitrogen in Petroleum Products and Lubricants'' (''ASTM D5291–10'').

[11] ASTM D396–14a ''Standard Specification for Fuel Oils'' (''ASTM D396–14a'').

[12] ASTM D396–90 ''Standard Specification for Fuel Oils'' (''ASTM D396–90'').

DOE's test procedure did not change in the most up-to-date version of the industry standard at that time, ANSI Z21.47–2016. *Id.* The revisions that were made were mostly editorial in nature, including moving Section 2 in ANSI Z21.47–2012 to Section 5 in ANSI Z21.47–2016, among other structural changes. In reviewing the 2012 and 2016 versions of the standard, DOE identified one apparent typographical error in the 2016 version.

Since the publication of the May 2020 RFI, an updated version of the ANSI Z21.47 standard was published in 2021: ANSI Z21.47–2021. DOE notes that the only substantive difference between the 2016 and 2021 versions relevant to the sections referenced by the DOE test procedure is related to burner operating characteristics tests specified in Section 5.4a of both ANSI Z21.47–2016 and ANSI Z21.47–2021.

The updates to ANSI Z21.47–2012 in ANSI Z21.47–2016 and ANSI Z21.47–2021, as well as the scope of the industry standard, are discussed in further detail in the following sections. As previously mentioned in section III.B of this document, DOE is proposing to amend the DOE test procedure to reference ANSI Z21.47–2021, as it is the most recent version of the industry test procedure.

a. Scope of ANSI Z21.47

DOE's test procedure for CWAFs currently includes reference to the scope Section (section 1.1) of ANSI Z21.47–2012. 10 CFR 431.76(c). As previously stated in section III.B.1.a of this document, DOE defines the scope for the testing of CWAFs in 10 CFR 431.76(a), and DOE's test procedure for CWAFs requires use of ANSI Z21.47 only for provisions pertinent to the measurement of the steady-state efficiency.

While DOE is proposing to incorporate by reference ANSI Z21.47–2021 in its entirety, DOE is proposing to explicitly identify the provisions of ANSI Z21.47–2021 that are applicable to the DOE test procedure for CWAFs, which would not include the scope section of that industry standard.

b. Typographical Error

Section 2.3.2(c) of ANSI Z21.47–2012 and the corresponding Section 5.3.2(c) of ANSI Z21.47–2021 provide installation requirements for horizontal furnaces. In the May 2020 RFI, DOE noted that Section 5.3.2(c)(iii) of ANSI Z21.47–2016 appears to contain a typographical error by referencing ''Figure 4, Enclosure types for alcove and closet installation tests for horizontal furnaces.'' 85 FR 26626, 26630. The title of Figure 4 in ANSI Z21.47–2016 is ''Enclosure types for alcove and closet installation tests for up-flow and down-flow furnaces,'' and as titled, Figure 4 applies only to up-flow and down-flow furnaces. It appears that the appropriate reference in Section 5.3.2(c)(iii) of ANSI Z21.47–2016 should be to Figure 5, ''Enclosed types for alcove and closet installation tests for horizontal furnaces.''

In the May 2020 RFI, DOE asked for comment on whether Section 5.3.2(c)(iii) of ANSI Z21.47–2016 should refer to Figure 5 in the test procedure, rather than Figure 4. *Id.* AHRI, Trane, and Carrier all agreed that the reference to Figure 4 was a typographical error, and that Section 5.3.2(c)(iii) of ANSI Z21.47–2016 should refer to Figure 5. (AHRI, No. 7 at p. 3; Trane, No. 9 at p. 2; Carrier, No. 4 at p. 1)

In the update to the industry standard, ANSI Z21.47–2021 corrected this typographical error by having Section 5.3.2(c)(iii) reference Figure 5. Therefore, the typographical error in ANSI Z21.47–2016 is no longer relevant because DOE is now proposing to incorporate by reference ANSI Z21.47–2021.

c. Propane Nomenclature

DOE also asked for comment regarding any differences between ANSI Z21.47–2012 and ANSI Z21.47–2016, and specifically whether there are any differences other than those already identified by DOE in the May 2020 RFI. *Id.* In response to DOE's request for comment regarding any additional differences between ANSI Z21.47–2012 and ANSI Z21.47–2016, AHRI and Trane both noted that in ANSI Z21.47–2016, the term ''propane'' is used in place of the term ''liquified petroleum gas;'' however, the commenters stated that this change is not substantive.[13] (AHRI, No. 7 at p. 3; Trane, No. 9 at p. 2) Carrier did not specifically comment on this nomenclature change, although it stated that there are no additional updates in AHRI Z21.47–2016 that would impact the DOE test procedure, other than those already identified by DOE. (Carrier, No. 4 at p. 1)

DOE notes that ANSI Z21.47–2021 also uses the term ''propane'' in place of ''liquified petroleum gas.'' DOE tentatively agrees with AHRI and Trane that the use of ''propane'' instead of ''liquified petroleum gas'' is for clarification only, and, therefore, does not affect the test procedure. Therefore, DOE is proposing to incorporate by reference ASNI Z21.47–2021 and specify use of the sections that correspond to the sections currently referenced in the DOE test procedure (*i.e.,* Sections 5.1 through 5.6, 5.40, and 7.2.1 of ANSI Z21.47–2021),), including the language referring to ''propane'' instead of ''liquefied petroleum gas.''

d. Burner Operating Characteristics Tests

Section 2.4a of ANSI Z21.47–2012 is referenced in the current DOE test procedure for CWAFs. 10 CFR 431.76(c)(2). This section states that three separate tests (each specified in Sections 2.9.1(a), 2.10.1, and 2.11.3, respectively, of ANSI Z21.47–2012) shall be performed prior to the performance test to ensure that there is no burner flashback and that the ignition system is working properly. Section 2.4a states that these three burner operating characteristics tests shall be conducted with test gas G (*i.e.,* butane-air). ANSI Z21.47–2021 includes a minor alteration to these provisions, which allows for performing these tests with a different test gas. Section 5.4a of ANSI Z21.47–2021 (previously section 2.4a in ANSI Z21.47–2012) states that the burner operating characteristics tests shall be performed with either test gas G or, at the manufacturer's option for testing premixed burners, test gas H (*i.e.,* propane-air). DOE notes that the burner operating characteristics tests, including the test gas used for these tests, do not affect the TE measurement of a CWAF. Therefore, DOE does not have evidence to deviate from the industry test procedure and proposes to adopt Section 5.4 of ANSI Z21.47–2021, including the previsions regarding the use of test gas as an option when performing the burner characteristics tests.

DOE seeks comment on whether the option provided in Section 5.4a of ANSI Z21.47–2021 to use test gas H when performing the three burner characteristics tests would impact the representativeness or burden of the thermal efficiency test.

4. ANSI/ASHRAE 103

In the May 2020 RFI, DOE noted that DOE's test procedure for gas-fired condensing CWAFs references Sections 7.2.2.4, 7.8, 9.2, 11.3.7.1 and 11.3.7.2 of ANSI/ASHRAE Standard 103–2007. 10 CFR 431.76; 85 FR 26626, 26630. DOE did not identify any substantive changes in the sections currently referenced by the DOE test procedure in the update from ANSI/ASHRAE 103–2007 to ANSI/

[13] Trane stated that ANSI Z21.47–2016 uses the term ''propane'' in place of the term ''liquified natural gas''. (Trane, No. 9 at p. 2) However, DOE notes that ANSI Z21.47–2012 uses the term ''liquified petroleum gas,'' not ''liquified natural gas,'' and believes this was what Trane intended to note.

ASHRAE 103–2017; however, DOE asked for comment on whether there were any differences between the two standards that are relevant to the DOE test procedure, and if so, how such differences would impact the representativeness of measurements and the test burden of the DOE test procedure for CWAFs, if adopted. *Id.*

AHRI commented that Sections 11.3.7.1 and 11.3.7.2 in ANSI/ASHRAE 103–2017 were modified to replace a fixed numerical value with mathematical expressions, but that there were no significant changes to the clauses specified in the DOE test procedure. (AHRI, No. 7 at p. 3) Trane stated that equations were modified only in terms from numeric to mathematical, but that this did not change the outcomes of the measurements. (Trane, No. 9 at p. 2)

DOE acknowledges that the two equations in Sections 11.3.7.1 and 11.3.7.2 of ANSI/ASHRAE 103–2017 have been modified. ANSI/ASHRAE 103–2007 includes variables in each equation that are defined as constants in the list of variables below each equation (*e.g.,* latent heat of vaporization equals 1053.3 Btu per pound mass (''Btu/lbm'')); in contrast, ANSI/ASHRAE 103–2017 inserts the constants directly into each equation. DOE has tentatively determined that the changes to the equations referenced by DOE (specifically those in clauses 11.3.7.1 and 11.3.7.2 of ANSI/ASHRAE 103–2017) are editorial in nature and do not change the calculated values. As previously mentioned in section III.B of this document, DOE is proposing to amend the DOE test procedure to reference ANSI/ASHRAE 103–2017, which would include these changes.

C. ''Thermal Efficiency Two'' Metric

As previously discussed, EPCA requires that the test procedures for CWAFs be those generally accepted industry testing procedures or rating procedures developed or recognized by AHRI or ASHRAE, as referenced in ASHRAE Standard 90.1. (42 U.S.C. 6314(a)(4)(A)) If such an industry test procedure or rating procedure is amended, the Secretary shall amend the test procedure for the product as necessary to be consistent with the amended industry test procedure or rating procedure unless the Secretary determines, by rule, published in the **Federal Register** and supported by clear and convincing evidence, that to do so would not meet the requirements in 42 U.S.C. 6314(a)(2) and (3) related to representative use and test burden.[14] (42 U.S.C. 6314(a)(4)(B))

As discussed in further detail in the sub-sections that immediately follow, DOE has tentatively determined that a test procedure that includes jacket loss and accounts for part-load operation would better produce test results that reflect energy efficiency, energy use, and estimated operating costs of CWAFs during a representative average use cycle. CWAFs are typically installed outdoors and as a result jacket losses can be a significant source of energy loss. Further, for models with multiple heating stages, performance can vary at the maximum input heating stage as compared to reduced input stage(s). Therefore, DOE is proposing to account for these factors by establishing a new test procedure and metric for CWAFs, termed ''Thermal Efficiency Two'' (''TE2''), which would generally adopt the same changes proposed for the current test procedure at appendix A, but would additionally account for jacket losses and part load operation. The proposed TE2 test procedure would account for flue losses in the same manner as the current TE metric. DOE proposes to establish a new appendix B to 10 CFR part 431, which would contain the test method for TE2.

If adopted, manufacturers would be permitted to make voluntary representations using TE2. Mandatory use of the TE2 test procedure would be required at such time as compliance is required with amended energy conservation standards based on TE2, should DOE adopt such standards. DOE is, therefore, also proposing to retain the test method for TE, which is proposed to be modified as discussed elsewhere in this document, in appendix A for use until such time as TE2 becomes mandatory.

DOE seeks comment on its proposal to establish a new test procedure (*i.e.,* appendix B) and metric (*i.e.,* TE2) for CWAFs, which would generally adopt the same changes proposed for the current test procedure at appendix A and account for flue losses in the same manner as the current TE metric, but would additionally account for jacket losses and part load operation.

1. Jacket Loss

As discussed, the current energy efficiency metric for CWAFs is TE. 10 CFR 431.77. TE for a CWAF is defined in 10 CFR 431.72 as 100 percent minus the percent flue loss, and is calculated, as specified in 10 CFR 431.76(e), by following the procedure specified in Section 2.39 of ANSI Z21.47–2012 for gas-fired CWAFs and Sections 11.1.4, 11.1.5, and 11.1.6.2 of HI BTS–2000 for oil-fired CWAFs.[15] A test method and calculations for determining the jacket loss percentage (*i.e.,* the hourly heat loss through the jacket divided by the hourly input and multiplied by 100) are included in Section 2.39 of ANSI Z21.47–2012 (and the corresponding Section 5.40 of ANSI Z21.47–2021), which is referenced in the DOE test procedure. However, the jacket loss percentage is not included in the equation used to calculate TE.[16]

In the May 2020 RFI, DOE requested comment on whether jacket loss should be accounted for in the calculation of TE. Specifically, DOE asked for comment regarding information and data on whether and to what extent inclusion of jacket loss would provide results that would more appropriately reflect energy efficiency during a representative average use cycle, and also information and data as to the test burden that would be associated with potential inclusion of jacket loss as part of the DOE CWAF test procedure. *Id*

ASAP, NEEA,[17] and the CA IOUs each supported adding jacket loss to the TE metric, stating that jacket loss could have a large impact on overall thermal efficiency. (ASAP, No. 5 at p.1; NEEA, No. 10 at p.3; CA IOUs, No. 8 at p.4) Specifically, the CA IOUs stated that furnace jacket losses have significant variations based on the installation configuration (*e.g.,* stand-alone vs. embedded in a commercial unitary air-conditioner (''CUAC'')) and the mode of operation used for testing (*e.g.,* full-load

[14] 42 U.S.C. 6314(a)(2) requires that test procedures be reasonably designed to produce test results which reflect energy efficiency, energy use, and estimated operating costs of a type of industrial equipment (or class thereof) during a representative average use cycle (as determined by the Secretary), and shall not be unduly burdensome to conduct. 42 U.S.C. 6314(a)(3) requires that if the test procedure is a procedure for determining estimated annual operating costs, such procedure shall provide that such costs shall be calculated from measurements of energy use in a representative average-use cycle (as determined by the Secretary), and from representative average unit costs of the energy needed to operate such equipment during such cycle.

[15] 10 CFR 431.76(f) (*i.e.,* section 5 of appendix A) includes a TE adjustment for condensing CWAFs. This adjustment adds the additional heat gain (expressed in a percent) from condensation of water vapor to the TE and subtracts the heat loss (expressed as a percent) due to the flue condensate flowing down the drain.

[16] DOE notes that Section 2.39 of ANSI Z21.47–2012 and Section 5.40 of ANSI Z21.47–2021 specify a maximum jacket loss of 1.5 percent for any furnace not covered by ''Federal Energy Acts'' (*i.e.,* not regulated by DOE). This provision is not referenced as part of the DOE test procedure.

[17] DOE also received comment from NEEA supporting the addition of jacket loss to the TE metric in response to the May 2020 ECS RFI. (NEEA, EERE–2019–BT–STD–0042–0024 at pp. 6–7)

vs. part-load), and suggested that DOE consider using the method in ASHRAE 155P for determining commercial boiler jacket loss for CWAFs, if this method is repeatable and reproducible. (CA IOUs, No. 8 at p. 4) NEEA stated that its energy modeling showed that improved insulation, decreased casing leakage, and decreased damper leakage can save up to 11 percent of annual energy consumption, and that this magnitude of energy savings is comparable with that of a condensing secondary heat exchanger, which is listed as ''max tech'' in the current CWAF energy conservation standards rulemaking. NEEA also stated that although CWAFs are separately regulated from CUACs, the two types of equipment are often contained within the same rooftop unit (''RTU''), and that enclosure improvements that would improve efficiency of CWAFs would also improve efficiency for CUACs. (NEEA, No. 10 at pp. 3–4) ASAP stated that since the impact of improved insulation is not currently considered in the test procedure, two CWAF units could have the same efficiency rating and yet provide significantly different performance if one unit had better insulation than the other. ASAP further explained that capturing the impact of improved insulation would provide testing results that would better reflect the efficiency of CWAFs during a representative average use cycle, and, in turn, provide better information to purchasers. (ASAP, No. 5 at p. 1)

AHRI, Carrier,[18] and Trane opposed incorporating jacket loss into the TE metric and asserted that it would have a minimal effect on performance. (AHRI, No. 7 at p. 5; Carrier, No. 4 at pp. 1–2; Trane, No. 9 at p. 3) AHRI and Trane stated that including jacket loss in the TE calculation would result in minimal change in TE and would lower the TE of the CWAF. (AHRI, No. 7 at p. 5 Trane, No. 9 at p. 3) Carrier also stated that for larger commercial equipment, factory installed options are available that can increase the size of the cabinet downstream of the furnace section, and that test burden on manufacturers would increase significantly if all options that impact jacket size are required to be tested. Carrier asserted that DOE would have to demonstrate the energy benefit since jacket losses are relatively low and their inclusion would result in increased test burden, different design requirements, and significantly higher cost for the manufacturer and the end customer if the minimum efficiency standards did not materially change. (Carrier, No. 4 at p. 2)

On May 12, 2020, DOE published an energy conservation standards RFI (''May 2020 ECS RFI'') for air-cooled CUACs, commercial unitary heat pumps, and CWAFs. 85 FR 27941. DOE received multiple comments from stakeholders in response to the May 2020 ECS RFI that are related to jacket loss and that are relevant to DOE's consideration of whether to incorporate jacket losses into the test procedure for CWAFs. Specifically, the Joint Advocates recommended that DOE amend the CWAF test procedure to include effects of improved insulation.[19] (Joint Advocates, EERE–2019–BT–STD–0042–0023 at p. 3) AHRI stated that it does not see a justification to include jacket loss in the measured energy efficiency, and that there would be minimal, if any, change in the usable heat provided to the end user if jacket loss is added to the TE calculation. (AHRI, EERE–2019–BT–STD–0042–0014 at p. 4) Goodman stated that jacket losses should not be included in the CWAF test procedure, and that inclusion of jacket loss would require new and more difficult testing and increased burden. (Goodman, EERE–2019–BT–STD–0042–0017 at pp. 2–3) Lastly, Goodman recommended DOE not include jacket loss in the DOE test procedure because ASHRAE 90.1–2019 requires that CWAF jacket loss not exceed 0.75 percent of the CWAF input rating, and therefore any effect on measured performance would be small enough to not justify the added burden. *Id.*

Regarding Goodman's reference to the jacket loss requirement for CWAFs in ASHRAE 90.1–2019, DOE notes that as part of a final rule published on May 16, 2012 (''May 2012 final rule'') amending energy conservation standards and test procedures for commercial heating, air-conditioning, and water-heating equipment, DOE addressed the ASHRAE 90.1 requirement pertaining to jacket loss.[20] In the May 2012 final rule, DOE determined that if ASHRAE adds a prescriptive requirement for equipment for which an efficiency level is already specified (*e.g.,* a jacket loss requirement in addition to a TE requirement), DOE does not have the authority to use a dual descriptor for a single equipment type. 77 FR 28928, 28937. Specifically, DOE explained that pursuant to 42 U.S.C. 6313(a)(6), the Secretary has authority to amend the energy conservation standards for specified equipment, but under 42 U.S.C. 6311(18), the statute's definition of the term ''energy conservation standard'' is limited to: (A) A performance standard that prescribes a minimum level of energy efficiency or a maximum quantity of energy use for a product; or (B) a design requirement for a product. DOE stated that the language of EPCA authorizes DOE to establish a performance standard or a single design standard. As such, DOE concluded that a standard that establishes both a performance standard and a design requirement is beyond the scope of DOE's legal authority. *Id.*[21] Additionally, DOE previously considered including jacket loss in the TE calculation in a NOPR published on December 13, 1999. 64 FR 69598, 69601 (''December 1999 NOPR''). In the December 1999 NOPR, DOE did not propose to include jacket loss in the TE calculation, having determined that, consistent with adopting industry test standards referenced in ASHRAE/IES Standard 90.1–1989, the statute's intent is to assign the same meaning to the term ''thermal efficiency'' as its definition in the corresponding referenced standards, *i.e.,* 100 percent minus percent flue loss. *Id.* DOE's determination in the December 1999 NOPR was informed by a public workshop held on April 14 and 15, 1998, and what DOE understood to be

[18] DOE also received comment from Carrier opposing this in response to the May 2020 ECS RFI, similarly, stating that jacket loss would have a minimal effect on performance, and that this minimal affect does not justify its inclusion the TE. (Carrier, EERE–2019–BT–STD–0042–0013 at p. 5)

[19] The Join Advocates include the following organizations: Appliance Standards Awareness Project, American Council for an Energy Efficient Economy, California Energy Commission, Natural Resources Defense Council, and Northeast Energy Efficiency Partnerships.

[20] The version of ASHRAE 90.1 that was available at the time of the May 2012 final rule (*i.e.,* ASHRAE 90.1–2010) includes the same 0.75-percent jacket loss requirement that is in ASHRAE 90.1–2019.

[21] DOE notes that it has adopted dual metrics under 42 U.S.C. 6313(a)(6)(A), when the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) has amended ASHRAE Standard 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings, and set a dual metric and accompanying standard levels. *See, e.g.,* 77 FR 28928 (May 16, 2012) (DOE adopted energy conservation standards for cooling and heating modes in terms of both Energy Efficiency Ratio (EER) and Coefficient of Performance (COP) for variable refrigerant flow (VRF) water-source heat pumps with cooling capacities at or greater than 135,000 Btu/h and less than 760,000 Btu/h (for which DOE did not previously have standards) in response to updated standards for such equipment in ASHRAE Standard 90.1.) DOE has also adopted a dual metric where a consensus agreement has been presented to DOE for adoption as a direct final rule (DFR) pursuant to 42 U.S.C. 6295(p)(4). *See, e.g.,* 76 FR 37408 (June 27, 2011) (For central air conditioners, DOE adopted dual metrics (*i.e.,* the Seasonal Energy Efficiency Ratio (SEER) and EER) for the hot-dry region as recommended by a consensus agreement supported by a variety of interested stakeholders including manufacturers and environmental and efficiency advocates.) DOE has interpreted these specific statutory provisions as authorizing an exception to the general rule previously stated.

the consensus of the participants that TE should not include jacket loss, because ANSI Z21.47 defined TE without jacket loss. *Id.* As such, DOE acknowledges that the TE as currently determined under ANSI Z21.47 does not include jacket loss even if it is a requirement of ASHRAE 90.1

As noted, DOE is generally required to adopt a test procedure for CWAFs that is consistent with the generally accepted industry testing procedures developed or recognized by AHRI or by ASHRAE, as referenced in ASHRAE Standard 90.1. (42 U.S.C. 6314(a)(4)(A)) Further, if such industry test procedure (*i.e.,* the test procedure referenced in ASHRAE Standard 90.1) is updated, DOE must amend its test procedure to be consistent with the amended industry test procedure, unless DOE determines, by rule published in the **Federal Register** and supported by clear and convincing evidence, that such amended test procedure would not meet the requirements in 42 U.S.C. 6314(a)(2) and (3) related to representative use and test burden. (42 U.S.C. 6314(a)(4)(B) and (C)) Additionally, EPCA also requires that DOE periodically evaluate the test procedures for CWAFs 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. (42 U.S.C. 6314(a)(1))

For the reasons that follow, DOE has tentatively determined that incorporating a jacket loss measurement into the test procedure and metric for CWAFs would improve the representativeness of the test procedure by capturing an attribute of CWAFs other than combustion efficiency (*i.e.,* jacket loss) that can have a substantive impact on the overall energy use of CWAFs.

The current TE is essentially a measure of combustion efficiency. However, the energy efficiency of the equipment is influenced by factors in addition to combustion efficiency (*i.e.,* jacket loss). Jacket loss contributes to the overall energy use of a CWAF and is, therefore, one of the parameters that determines a CWAF's overall efficiency. Heat loss through the cabinet (*i.e.,* jacket loss) is proportional to the thickness of the insulation and/or insulative material used. DOE tentatively agrees with ASAP that CWAFs with the same TE, as determined under the current DOE test procedure, could have different performance in the field if one unit has different insulation than the other. DOE also notes that the vast majority of CWAFs are installed within CUACs located on rooftops, and that these outdoor installations will result in greater jacket loss than CWAFs installed indoors because of the colder ambient air. As such, DOE tentatively agrees with the CA IOUs that performance of a CWAF will vary depending on installation location because of different levels of jacket loss. Differences in performance based on differences in jacket loss are not captured by the current DOE test procedure and metric. Incorporating jacket loss into a TE2 metric will therefore account for differences in CWAF insulation. Additionally, weighting jacket loss based on installation location, which DOE discusses more in the following paragraphs, will account for the differences in jacket loss across various installation locations.

DOE is proposing that, for CWAFs that are designed for outdoor installation (including but not limited to CWAFs that are weatherized, or approved for resistance to wind, rain, or snow) or designed for indoor installation in an unheated space (*i.e.,* isolated combustion systems),[22] jacket loss shall be measured in accordance with the Section 5.40 of ANSI Z21.47–2021. DOE is proposing to multiply this measured jacket loss by jacket loss factors to account for differences in installation location. DOE proposes that a jacket loss factor of 1.7 for CWAFs designed for indoor installation in an unheated space (*i.e.,* isolated combustion system), or 3.3 for CWAFs designed for outdoor installation (including, but not limited to, CWAFs that are weatherized, or approved for resistance to wind, rain, or snow) be multiplied by the measured jacket loss before subtracting the product from thermal efficiency (*i.e.,* TE2 is calculated as 100 percent minus flue and jacket loss, when the jacket loss is the measured jacket loss multiplied by the jacket loss factor). DOE is also proposing that the jacket loss shall be zero for CWAFs designed for installation indoors within a heated space because the heat loss through the CWAF's jacket would go directly into the heated space. DOE notes that this approach is consistent with the approach taken in appendix N to subpart B of 10 CFR part 430 for measuring AFUE in residential furnaces, which references ASHRAE 103. Therefore, DOE has tentatively determined these are the appropriate jacket loss factors to use based on the values found in Section 11.2.11 of ASHRAE 103–2017, and is proposing to use these factors in newly proposed appendix B.[23]

As previously mentioned, DOE references Section 2.39 of ANSI Z21.47–2012 (now Section 5.40 in ANSI Z21.47–21), which includes a test procedure for determining jacket loss. DOE does not currently reference Annex J of ANSI Z21.47–2012, which includes the equation used to calculate jacket loss. Annex J also includes Figures J.1 and J.2 which are used to determine the coefficient of convection and coefficient of radiation for the surface, which are two coefficients used in the calculation of jacket loss. DOE is proposing to incorporate by reference the jacket loss test procedure specified in Section 5.40 of ANSI Z21.47–2021, which includes a reference to Annex J of ANSI Z21.47–2021, for both gas-fired and oil-fired CWAFs. Specifically, DOE is proposing to adopt this test procedure for measuring jacket loss when testing to newly proposed appendix B to determine TE2.

To the extent that manufacturers participate in the industry certification program under ASHRAE 90.1, such manufacturers should already be measuring jacket loss according to the test procedure proposed in this NOPR due to the prescriptive jacket loss requirement in ASHRAE 90.1. Based on a review of models on the market, DOE found the majority of CWAFs indicate in product literature that they comply with the requirements of ASHRAE 90.1, which indicates that many CWAFs are already tested for jacket loss.

DOE is proposing to adopt the industry test standard for determining jacket loss that DOE has tentatively determined is currently being used by industry, and as such would not be unduly burdensome. Additionally, testing according to appendix B would be mandatory only at such time as compliance is required with amended energy conservation standards based on TE2, should DOE adopt such standards. Therefore, DOE proposes to incorporate jacket loss in the proposed TE2 metric.

DOE seeks comment on its proposal to require jacket loss be measured when testing CWAFs designed for outdoor

[22] This description of a CWAF designed for outdoor installation is consistent with a residential weatherized warm air furnace specified in 10 CFR 430.2.

[23] DOE notes that the jacket loss factor in Section 11.2.11 of ASHRAE 103–2017 for equipment intended for indoor installation within a heated space is 0.0. As such, jacket loss would be calculated as zero. Therefore, as previously mentioned, DOE is proposing the jacket loss would be assumed to be zero for CWAFs intended for indoor installation within a heated space.

installation and designed for indoor installation within an unheated space when determining TE2 pursuant to newly proposed appendix B, and on its proposed method for measuring jacket loss. DOE also seeks comment on its proposal that jacket loss for CWAFs intended for indoor installation within a heated space would be assumed to be zero, and on its proposed jacket loss factors for CWAFs designed for outdoor installation and designed for indoor installation within an unheated space.

2. Part-Load Performance

In response to the May 2020 RFI, DOE received comments from NEEA and the CA IOUs encouraging DOE to adopt a metric and test procedure that account for operation at part load. (NEEA, No. 10 pp. 1–2; CA IOUs, No. 8 at p. 1) NEEA and the CA IOUs both asserted that CWAFs spend the majority of their time in a low fire mode (*i.e.,* part load) and that adopting a metric that includes part load would better represent the operation of CWAFs in the field. *Id.* More specifically, NEEA asserted that CWAFs often spend 10 to 20 percent of their time at high fire mode (*i.e.,* full load), and that DOE should update its test procedure to include reduced firing rates (*i.e.,* part-load) and seasonal performance so that the test procedure is more representative of an average use cycle.[24] NEEA recommended a seasonal metric be used, asserting that jacket loss, damper leakage, and fan performance would be affected by CWAFs installed in colder climates. (NEEA, No. 10 p.2) NEEA also commented that other DOE test procedures for HVAC equipment have been transitioning to measure part-load and seasonal performance, and that the CWAF test procedure should likewise be updated. (NEEA, No. 10 p. 1) The CA IOUs stated that cyclic losses due to cycling of the burners negatively impacts efficiency of a CWAF, and that accounting for this would increase the representativeness of the test procedure. (CA IOUs, No. 8 at pp. 1–2)

AHRI commented that any additional requirements beyond the current test procedure provisions would be a burden to manufacturers, and that any changes that affect testing or calculations are likely to be overly burdensome compared to any benefits, due to what AHRI characterized as the relatively small market for these appliances. (AHRI, No. 7 at p. 77)

DOE reviewed the current CWAF market and found that the vast majority of CWAFs certified to DOE have two or more stages of heating. DOE notes that CWAFs with two or more stages can operate at reduced firing rates to meet the building load. Under the current DOE test procedure, TE reflects the efficiency of the burner and the efficiency of the heat exchanger at full load. When a CWAF burner operates at a reduced input rate (*i.e.,* part load), the ratio of heat exchanger surface area to burner input rate is increased (in comparison to operation at full load), which theoretically should increase the efficiency of the CWAF compared to operating at full load, if other aspects of operation are consistent. However, depending on the air-fuel ratio or other factors impacting combustion efficiency, the combustion efficiency could decrease, and therefore, the change in performance, including whether efficiency is improved or reduced at part-load, could vary from model to model. Therefore, CWAF part-load performance has the potential to be substantively different from full-load performance and including part-load performance in the measurement of CWAF efficiency would allow the efficiency metric to account for this potential difference and be more representative. To provide for measured test results that are more representative of the average use cycle of CWAFs that are two-stage and modulating burner units (*i.e.,* CWAFs that operate at less than full load), DOE proposes to include a part-load measurement in the test procedure proposed at newly proposed appendix B. DOE has tentatively determined that including a part-load test procedure within the DOE test procedure would better capture how CWAFs operate in the field and would be more representative of the performance of CWAFs during an average use cycle, particularly for models that have two or more stages of heating. Therefore, DOE is proposing to include both part-load and full-load operation tests in the newly proposed appendix B.

Specifically, DOE proposes to require that, for two-stage or modulating burner models, the flue loss of the unit under test be determined as specified in section 2 of appendix A (formerly 10 CFR 431.76(c)) at both the maximum and minimum input rates on the nameplate of the unit. The jacket loss (as described in section III.C.1 of this document) would be determined at the maximum input rate and optionally be determined at the minimum input rate. If the jacket loss were determined only at the maximum input rate, it would be assigned an equivalent value at the minimum input rate. TE2 would then be calculated as the average of the efficiencies determined at both the maximum and minimum input rates using the flue loss and jacket loss determined at each input rate.

Averaging the performance at the maximum and minimum input rate weights both full-load and part-load CWAF operation equally (*i.e.,* representing CWAF operation at full load 50 percent of the time and part load 50 percent of the time). DOE considered the relationship between full-load operation and part-load operation presented in the comments from NEEA. However, the 10 to 20 percent estimate of operation at full load referenced by NEEA was based on data for climate regions represented by Winnipeg, Montreal, and Toronto. DOE has tentatively determined that operating conditions represented by these climate zones are not representative of the United States, which includes more temperate climate zones.

DOE also considered relying on the part-load and full-load burner operating hour calculations for two-stage and modulating furnaces specified in Appendix C of ANSI/ASHRAE 103–2017. However, DOE tentatively determined that this approach would not be representative because the calculations specified in Appendix C of ANSI/ASHRAE 103–2017 include assumptions that are specific to residential furnaces (*e.g.,* national average heating load hours) that may not be representative for CWAFs. For example, CWAFs may operate more frequently during business hours, whereas a residential furnace may operate more frequently during off-business hours when people are more likely to be at home.

DOE tentatively finds that CWAFs spend a substantive amount of time in part-load. Absent nationally representative data or information to support weighting factors for full-load and part-load performance that are more representative of an average use cycle, DOE has tentatively determined that weighting both equally is appropriate at this time, however DOE seeks comment on this tentative determination.

DOE seeks comment on its proposal to add a part-load test procedure to be incorporated into the newly proposed TE2 metric. DOE also seeks comment on its proposal to calculate TE2 by averaging performance at the maximum and minimum fire rate and seeks and any related data. DOE also requests comment on alternate weighting values, including those discussed, that may be more nationally representative of an

[24] NEEA referenced the following energy model: Energy Modeling of Commercial Gas Rooftop Units in Support of CSA P.8 Standard.

average use, along with any relevant data.

D. Electrical Energy Consumption

In the May 2020 RFI, DOE noted that the DOE test procedure for CWAFs does not include any measurement of electrical consumption in its determination of the efficiency of CWAFs, including electrical consumption of blowers/fans, controls, or other auxiliary electrical consumption. 85 FR 26626, 26632. DOE explained that CWAFs are typically part of a single package that also includes air-conditioning equipment, and that the test method and metrics for commercial air-conditioning and heating equipment (*i.e.,* integrated energy efficiency ratio (''IEER'')) accounts for the electrical consumption of the blower; as such, the electrical consumption of the blower has not been included in the CWAF test method. *Id.* DOE noted that any auxiliary electrical consumption associated only with the furnace operation when heating is not accounted for in any metric. *Id.*

In the May 2020 RFI, DOE asked for comment on whether it should consider including the electrical consumption of CWAFs in the CWAF efficiency metric or test procedure, as well as on the merits and burdens of such approach. *Id.* DOE also asked for comment on which components' electrical consumption would be appropriate to include, noting that the electrical consumption of the CWAF blower is typically factored into other commercial equipment efficiency metrics and test procedures. *Id.*

ASAP, the CA IOUs, and NEEA recommended that DOE account for electrical consumption of the CWAF. (CA IOUs, No. 8 at p. 2; ASAP, No. 5 at p. 1; NEEA, No. 10 at p. 4) More specifically, ASAP urged DOE to ensure that all electrical consumption associated with CWAFs (including CWAF auxiliary electrical consumption) is captured in either the CWAF test procedure or the test procedure for CUACs. Specifically, regarding auxiliary electrical consumption, ASAP stated that capturing auxiliary electrical consumption would better reflect the efficiency of CWAFs during a representative average use cycle, thus providing better information to purchasers. (ASAP, No. 5 at p. 2) ASAP also stated that the term sheet from the Appliance Standards and Rulemaking Federal Advisory Committee (''ASRAC'') working group for CUACs and CWAFs contained a recommendation that DOE amend the test procedure for CUACs to better capture total fan energy use, including the energy use associated with the supply fan operation when the unit is in heating mode. (ASAP, No. 5 at p. 1) The CA IOUs also noted that the ASRAC term sheet includes a recommendation to update the CUAC test procedure to ''better represent total fan energy use, including considering (a) alternative external static pressures; and (b) operation other than mechanical cooling and heating.'' (ASAP, No. 5 at pp. 1–2; CA IOUs, No. 8 at pp. 2–3) Similarly, NEEA stated that electrical energy should be considered in total energy consumption in all operating modes, citing that RTUs spend the majority of their time in ventilation mode, and that electrical energy consumption of an RTU is 4 to 11 percent of total seasonal energy consumption. (NEEA, No. 10 at p. 4) Additionally, NEEA stated that the current CWAF test procedure does not capture many energy efficient features that are currently available on the market and, therefore, does not effectively allow manufacturers to distinguish more efficient equipment.[25] NEEA also encouraged DOE to consider a calculation-based test procedure to include other energy using components and operating modes. (NEEA, No. 10 at pp. 3–4) DOE also received comment from the Joint Advocates in response to the May 2020 ECS RFI, recommending DOE amend the CWAF test procedure to capture auxiliary electrical consumption. (Joint Advocates, EERE–2019–BT–STD–0042–0023 at p. 3)

AHRI, Carrier, and Trane recommended against including the electrical consumption of CWAFs in the efficiency metric or test procedure. (AHRI, No. 7 at p. 6; Trane, No. 9 at p. 4; Carrier, No. 4 at p. 3) AHRI stated that the electrical energy consumption of CWAF components is minimal compared to the fossil fuel energy used for heating. (AHRI, No. 7 at p. 6) Trane explained that combustion fan motor wattage is very small as a percentage of these commercial furnaces (Trane, No. 9 at p. 4) More specifically, AHRI stated that the energy consumption of a combustion fan is a fraction of a percent of the total energy consumption. Carrier similarly asserted that the power draw of the inducer fan used to create the draft through the furnace is minimal compared to the energy of combustion. (Carrier, No. 4 at p. 3) AHRI and Trane asserted that the extra burden from retesting and certifying to a new metric is not worth adding electrical consumption into a new efficiency metric. (AHRI, No. 7 at p. 6; Trane, No. 9 at p. 4) AHRI and Carrier noted that CWAFs are often sold as part of a packaged unit (*i.e.,* within a CUAC), and that the blower and fans are included in the performance measurement of the CUAC. (AHRI, No. 7 at p. 6; Carrier No. 4 at p. 3) AHRI also noted that the total air-conditioning hours are far greater than the total heating hours. (AHRI, No. 7 at p. 6; Carrier, No. 4 at p. 3)

DOE agrees with stakeholders that CWAFs are typically installed within a CUAC, and that the energy consumption of the supply air fan is captured in the current CUAC test procedure. DOE notes that the energy consumption of the supply air fan during furnace-only operation is not captured within the CUAC test procedure; however, DOE has tentatively determined that such energy consumption would be better addressed in a future amendment to the CUAC test procedure, rather than also integrating supply fan consumption into the CWAF test procedure. This approach would allow for the supply air fan's energy consumption to be captured in a single test procedure. Similarly, DOE notes that many of the components that were referenced by NEEA are related to CUAC performance. As such, DOE has tentatively determined that these components would be better addressed a future CUAC test procedure amendment. Therefore, DOE has tentatively determined not to include supply fan energy consumption in the CWAF metric.

DOE also considered whether to include the electrical energy consumption of other auxiliary components of CWAFs within the DOE test procedure. In a final rule published on May 4, 2016, amending the energy conservation standards for CWAFs, DOE analyzed the auxiliary energy consumption of CWAFs, finding that on average, auxiliary power consumption for the draft inducer was 100 W for gas-fired CWAFs and 220 W for oil-fired CWAFs. (*See* section 7B.3 of the Final Rule TSD, EERE–2013–BT–STD–0021–0050.) DOE also estimated the power consumption of other auxiliary components (*e.g.,* 25 W for spark ignition). *Id.* This auxiliary power consumption, as compared to the fossil fuel energy input rate, represents a fraction of a percent of the total energy consumption of a CWAF. As such, improvements in electrical power consumption, if integrated into TE, would have a negligible impact on the measured energy efficiency of a CWAF. DOE has tentatively determined that incorporating electrical consumption into the measurement of CWAF

[25] NEEA stated that these efficient components include low leak dampers, improved insulation or thermally broken insulation, variable speed fans, economizing capability, improved controls, demand control ventilation, modulating heat/high turndown furnaces, and heat recovery. (NEEA, No. 10 at p. 3)

efficiency would not substantially improve the representativeness of the test procedure and would increase testing burden. DOE also notes that including electrical consumption in the determination of CWAF efficiency would be a significant deviation from how CWAF efficiency is currently measured, for which DOE must demonstrate ''clear and convincing evidence'' that such change would more fully comply with the requirements of EPCA. Because DOE has tentatively concluded it is unlikely that inclusion of electrical energy in the TE metric would impact the thermal efficiency rating, DOE tentatively concludes that such a change would not meet the clear and convincing threshold established by DOE. Therefore, DOE is not proposing to update the CWAF test procedure to include electrical consumption.

E. Other Test Procedure Updates and Clarifications

1. Flue Temperature Measurement in Models With Multiple Vent Hoods

In the May 2020 RFI, DOE noted that neither the DOE test procedure nor the ANSI Z21.47 test procedure specifies how to perform the flue temperature measurement if a unit has multiple vent hoods, and that models are currently available on the market with multiple vent hoods. 85 FR 26626, 26631. DOE notes that in this NOPR, as in the May 2020 RFI, DOE's references to a ''vent hood'' are synonymous with a ''vent pipe.''

In the May 2020 RFI, DOE requested comment on how CWAFs with more than one vent hood are currently tested and whether it should consider adding provisions in the DOE test procedures to address measuring the flue gas temperature of a unit with multiple vent hoods. DOE also asked how best to measure flue gas temperature in such units. *Id.*

AHRI stated that the manufacturers' installation instructions should include information regarding the use of multiple vents and each vent's functionality. AHRI stated that if the vent hood modules are the same size, the results are averaged; however, if they are different sizes, the test results for each vent hood should be adjusted accordingly before averaging the results. AHRI stated that, for example, if one vent is intended to exhaust two-thirds of the flue product and the second is intended to exhaust the remaining one-third, then this should be specified in the installation instructions, and a weighted average used to determine the flue gas temperature. (AHRI, No. 7 at p. 5)

Trane stated that DOE should use the instructions in both the installation operation manuals as well as the supplemental testing instruction (''STI'') supplied when a model is certified to DOE for determining how to measure flue gas for models with multiple vent hoods. (Trane, No. 9 at p. 3)

Carrier stated that the procedure it uses for models with multiple vent hoods is to analyze combustion products and measure flue temperature separately in each vent hood, and then use the averaged data of all vents to calculate TE. (Carrier, No. 4 at p. 2)

DOE tentatively agrees that results should be measured in each vent hood and weighted proportionally to the size of each vent hood when calculating TE. For units with multiple vent hoods of the same size, this approach would result in the measurements being averaged. Therefore, in order to ensure consistency between tests, DOE is proposing to add instructions to clarify the test method for models with multiple vent hoods. DOE proposes that measurements used to calculate TE (*e.g.,* flue gas temperature, CO_2 in flue gasses), be made separately for each vent hood, and that they are weighted proportionally to the size of each vent hood when calculating flue loss. Further, DOE proposes that test requirements, such as determining when equilibrium conditions occur based on the flue gas temperature, are determined based these weighted measurements. This proposal is predicated on the assumption that the amount (*i.e.,* mass flow) of flue exhaust exiting each vent hood is proportional to the hood size. DOE recognizes that vent hood ''size'' may be measured in various ways, and therefore is proposing to specify that vent hoods size would be determined by calculating the outlet face area of the vent hood. As noted, DOE is proposing this additional procedure for clarification and to improve test repeatability, as ANSI Z21.47–2021 does not address flue temperature measurements in CWAFs with multiple vent hoods.

DOE seeks comment on its proposal to provide instructions in the DOE test procedure for testing units with multiple vent hoods.

DOE seeks comment on its assumption that the amount (*i.e.,* mass flow) of flue exhaust exiting each vent hood is proportional to the size of the vent hood. Furthermore, DOE seeks comment on its proposal to compare vent hood outlet face areas to determine vent hood size.

2. Flue Temperature Measurement in Models With Vent Space Limitations

In the May 2020 RFI, DOE noted that Section 2.16 of ANSI Z21.47–2012 and Section 5.16 of ANSI Z21.47–2016 both specify measuring the flue gas temperature in the vent pipe using nine individual thermocouples placed in specific locations; however, these sections do not provide guidance on how to measure the flue gas temperature if the vent size constrains the space where the thermocouples are to be placed to the point that normal operation of the unit is inhibited when nine thermocouples are installed. 85 FR 26626, 26631–26632. DOE notes this is also true of Section 5.16 in ANSI Z21.47–2021. In the May 2020 RFI, DOE noted that a vent may be so small (if, for example, a unit has multiple vents) that it is not practical to measure the flue gas temperature using nine thermocouples. DOE also explained that during testing of one unit with a particularly small vent hood, DOE found that placing nine [26] thermocouples was not practical due to space limitations. 81 FR 26626, 26631–26632.

In the May 2020 RFI, DOE asked for comment on how CWAFs with vent size constraints are currently tested and whether DOE should consider adding provisions in the DOE test procedure to address measuring the flue gas temperature when space limitations preclude the use of nine thermocouples. DOE also asked how best to measure flue gas temperature in such units. 81 FR 26626, 26632.

AHRI stated that the manufacturer's test instructions may specify that the number of thermocouples be limited due to space constraints within the draft hood. In such instances, the testing laboratory will follow the manufacturer's test instructions for set-up. (AHRI, No. 7 at p. 6) Trane stated that it believes the manufacturer will communicate how measurements were performed either in the STI or installation manual to achieve the performance metric rating that is certified, and that DOE should follow those instructions. (Trane, No. 9 at p. 3) Carrier acknowledged that, at times, it is impossible to fit nine thermocouples adequately in a smaller vent and stated that it uses the procedure from ANSI/ASHRAE 103, which specifies the number of thermocouples depending on

[26] In the May 2020 RFI, DOE stated that DOE found that placing more than four thermocouples for that particular test unit was not practical due to space limitations. 85 FR 26626, 26632. However, this was a typographical error; DOE intended to state that placing nine thermocouples (not more than four) was not practical in this instance due to space limitations.

the diameter of the vent. Carrier further stated that ANSI/ASHRAE 103 requires five thermocouples for vents 2 inches in diameter and smaller, nine thermocouples for vents greater than 2 inches in diameter, and 17 thermocouples for a stack measurement. (Carrier, No. 4 at p. 2)

In order to ensure consistency and repeatability in the application of the test method for models with small vent hoods, DOE recognizes the need to specify how to perform the DOE test procedure when nine thermocouples do not fit inside the vent hood. Although AHRI and Trane suggest allowing the manufacturer to specify how the thermocouples should be installed, this could lead to inconsistent test set-up and results for models with small vents if manufacturers choose different approaches for testing. Therefore, DOE is proposing to align its test procedure with ASHRAE 103–2017. More specifically, DOE is proposing to specify in the DOE test procedure that when testing gas- and oil-fired CWAFs, the flue gas temperatures shall be measured in the vent hood using nine individual thermocouples when the vent hood is larger than 2 inches in diameter and may optionally be measured using five individual thermocouples when the vent hood is 2 inches or smaller in diameter.

DOE seeks comment on the proposal to specify in the DOE test procedure that when testing gas- and oil-fired CWAFs, the flue gas temperatures shall be measured in the vent hood using nine individual thermocouples, or if the vent hood is 2 inches or smaller in diameter, five thermocouples may optionally be used.

3. Input Rate Tolerance

In the May 2020 RFI, DOE noted that its test procedure for gas-fired CWAFs references the test method in ANSI Z21.47, and that the thermal efficiency test in Section 2.39 of ANSI Z21.47 requires that the test be conducted at normal inlet pressure and at 100 percent of normal input rate (*i.e.,* the maximum hourly Btu input rating specified by the manufacturer). 10 CFR 431.76(c)(1). DOE noted that no tolerance is provided on the input rate in section 2.39, so when taken literally, this provision could be interpreted to require that the firing rate be exactly 100 percent of the nominal input rate. DOE further noted that other types of fossil-fuel-fired equipment such as commercial packaged boilers, commercial water heaters, residential water heaters, residential furnaces, and residential boilers require the input rate during testing to be within ±2 percent of the nameplate input rate. 85 FR 26626, 26631.

In the May 2020 RFI, DOE asked for comment on whether industry uses a tolerance when testing to ANSI Z21.47, and if so, what tolerance is used. DOE also asked whether a tolerance should be specified for the input rate during testing of gas-fired CWAFs, and if so, what tolerance would be appropriate. *Id.*

Carrier stated that it uses a minor plus-and-minus tolerance on input rate and that it understands that this approach is not included in ANSI Z21.47, but it has been used on furnace testing at Carrier for many years.[27] (No. 4 at p. 2) Trane and AHRI both commented that section 5.4.4 [28] of ANSI Z21.47–2016 includes a ±2 percent tolerance on input rate. (AHRI, No. 7 at p. 5; Trane, No. 9 at p. 3) The CA IOUs recommend including a tolerance of ±2 percent of rated input for gas-fired CWAFs, consistent with the commercial boiler test methods described in AHRI 1500–2015. (CA IOUs, No. 8 at p. 4.)

DOE notes that Sections 5.5.4 of ANSI Z21.47–2016 and 5.5.4 of ANSI Z21.47–2021 both specify a ±2 percent tolerance on the manufacturer's specified hourly Btu input rating, and that the same ±2 percent input rate tolerance is also specified in Section 2.5.4 of ANSI Z21.47–2012, which is currently incorporated by reference in the current DOE test procedure. As discussed in section III.B.3 of this document, DOE is proposing to reference the Sections of ANSI Z21.47–2021 that correspond to the sections in ANSI Z21.47–2012 that are currently referenced, including Section 5.5 of ANSI Z21.47–2021. This proposal, therefore, incorporates Section 5.5.4 of ANSI Z21.47–2021, which includes the ±2 percent tolerance on the manufacturer's specified hourly Btu input rating.

4. Flue Loss Determination

Section 2.39 of ANSI Z21.47–2012 and Section 5.40 ANSI Z21.47–2021 reference Annex I for the determination of flue loss that is used in the TE calculation. Annex I includes two methods for determining flue loss—one method that uses a calculation, and one method that uses nomographs shown in Figures I.1 and I.2 of ANSI Z21.47–2021. The nomograph method may only be used when the heating value, specific gravity, and flue gas CO_2 of a CWAF fall within a specified range.[29] If these conditions are met, either calculation method may be used. DOE notes that the option to use either method may result in issues with repeatability if the determination of flue loss varies when using each method. Therefore, DOE is proposing in section 4 of appendix A (formerly 10 CFR 431.76(e)) that the calculation method must be used when determining flue loss. DOE is proposing use of the calculation method rather than the nomograph method because the nomograph method is not applicable for all tests, and the calculation method is likely to provide better repeatability by eliminating subjective differences in interpreting the nomograph.

DOE seeks comment on its proposal to require the calculation method specified in Annex I of ANSI Z21.47–2021 be used when determining flue loss, and not the nomograph method.

F. Test Procedure Costs, Harmonization, and Other Topics

1. Test Procedure Costs and Impact

In this NOPR, DOE proposes to amend the existing test procedure for CWAF for determining TE by incorporating by reference the most up-to-date versions of the industry standards currently referenced in the DOE test procedure, and by providing additional detail for the test setup for models with multiple vent hoods and models with vent hoods having space limitations. DOE has tentatively determined that these proposed amendments for determining TE would not be unduly burdensome for manufacturers to conduct, and that the proposed test procedures for this equipment are consistent with the industry test procedure updates. DOE has tentatively determined that the proposed amendments to the test procedure for determining TE would improve the representativeness, accuracy, and reproducibility of the test results and would not be unduly burdensome for manufacturers to conduct. DOE expects that the proposed test procedure in appendix A for measuring and TE would not increase testing costs.

DOE also is proposing to establish a new TE2 metric and establish a new appendix B, which would include the test procedure for determining TE2. DOE estimates that the additional test cost due to the additional part-load test and jacket loss test required for the TE2

[27] Carrier did not provide a specific value for the tolerance it uses for CWAF testing.

[28] DOE understands commenters to have intended to reference section 5.5.4 as there is no section 5.4.4 in ANSI Z21.47–2016.

[29] Heating value for natural gas or propane must be 970–1100 Btu/ft^3 or 2466–2542 Btu/ft^3, respectively. Specific gravity for natural gas or propane must be 0.57–0.70 or 1.522–15.74, respectively. Ultimate carbon dioxide for natural gas or propane must be 11.7–12.2% or 13.73–13.82%, respectively.

metric would be $2,200, compared to the current DOE test procedure, which DOE estimates to be $4,200 at a third-party laboratory (*i.e.,* a total estimated cost of $6,400 per tested unit for the amended TE2 test procedure). Therefore, assuming two units are tested per basic model,[30] DOE estimates the testing cost associated with the newly proposed appendix B test procedure to be $12,800 per basic model.

In accordance with 10 CFR 429.41, CWAF manufacturers may elect to use an alternative efficiency determination method (''AEDM'') to rate models for the TE2 metric, which significantly reduces testing costs to industry. DOE estimates the per-manufacturer cost to develop and validate an AEDM to determine TE2 for CWAF equipment to be $17,300. DOE estimates a cost of $46 per basic model for determining energy efficiency using a validated AEDM.[31]

Additionally, DOE has tentatively determined that the proposed appendix B test procedure and TE2 calculation would alter the measured energy efficiency of a CWAF.

As previously discussed, the proposed test procedure provisions regarding TE2 would not be mandatory unless and until compliance is required with amended energy conservation standards that rely on TE2. Because DOE is not referencing a prevailing industry test procedure for determination of TE2, DOE expects that the updated DOE test procedure in appendix B would increase the testing burden on CWAF manufacturers if use of appendix B were required in the future. However, DOE has tentatively determined that the test procedure amendments, if finalized, would not require manufacturers to redesign any of the covered equipment, would not require changes to how the equipment is manufactured, and would not impact the utility of the equipment.

DOE seeks comment on its understanding of the impact of the test procedure proposals in this NOPR, specifically with respect to DOE's estimated test costs, and DOE's initial conclusion regarding the testing costs associated with the proposed test procedure for TE2 as compared to the current test procedure.

2. Harmonization With Industry Standards

DOE's established practice is to adopt relevant industry standards as DOE test procedures unless such methodology would be unduly burdensome to conduct or would not produce test results that reflect the energy efficiency, energy use, water use (as specified in EPCA) or estimated operating costs of that product during a representative average use cycle. 10 CFR 431.4; section 8(c) of appendix A 10 CFR part 430 subpart C. In cases where the industry standard does not meet EPCA statutory criteria for test procedures, DOE will make appropriate modifications to the DOE test procedure through the rulemaking process.

The current test procedures for CWAF at 10 CFR 431.76 incorporates by reference UL 727–2006 for testing oil-fired CWAFs, HI BTS–2000 for performing fuel oil analysis and for calculating flue loss of oil-fired CWAFs, ANSI Z21.47–2012 for testing gas-fired CWAFs, and ANSI/ASHRAE 103–2007 for testing condensing gas-fired CWAFs. As discussed, the proposed amendments to the DOE test procedure for determining TE would update the references to the incorporated industry testing standards. Also as discussed, DOE is proposing to adopt a new metric, TE2, for CWAFs. There is no industry testing standard that provides for determining TE2. However, the test procedure provisions that provide the measured inputs for determining TE2 rely on the same industry testing standards DOE is proposing to reference for determining TE.

DOE requests comments on the benefits and burdens of the proposed updates and additions to industry standards referenced in the test procedure for CWAFs.

DOE recognizes that adopting industry standards with modifications imposes a burden on industry *(i.e.,* manufacturers face increased costs if the DOE modifications require different testing equipment or facilities). DOE seeks comment on the degree to which the DOE test procedure should consider and be harmonized further with the most recent relevant industry standards for CWAFs, and whether there are any changes to the Federal test method that would provide additional benefits to the public. DOE also requests comment on the benefits and burdens of, or any other comments regarding adopting of, any industry/voluntary consensus-based or other appropriate test procedure, without modification.

G. Compliance Date

EPCA prescribes that if DOE amends a test procedure, 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 360 days after publication of such a test procedure final rule in the **Federal Register**. (42 U.S.C. 6314(d)(1))

To the extent the modified test procedure proposed in this document is required only for the evaluation and issuance of updated efficiency standards, use of the modified test procedure, if finalized, would not be required until the compliance date of updated standards.

IV. Procedural Issues and Regulatory Review

A. Review Under Executive Order 12866

The Office of Management and Budget (''OMB'') has determined that this test procedure rulemaking does not constitute a significant regulatory action under section 3(f) of Executive Order (''E.O.'') 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 OMB.

B. Review Under the Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) requires preparation of an initial regulatory flexibility analysis (''IRFA'') 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 (Aug. 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: *www.energy.gov/gc/office-general-counsel.*

The following sections detail DOE's IRFA for this test procedure rulemaking.

[30] Per the sampling requirements specified at 10 CFR 429.11(b), manufacturers are required to test at least two units to determine the rating for a basic model, except if only one unit of the basic model is produced.

[31] DOE's estimated initial cost to develop and validate an AEDM includes (1) 80 hours to develop the AEDM based on existing simulation tools; (2) an additional 16 hours to validate the AEDM for two basic models at the cost of an engineering calibration technician wage of $46 per hour; and (3) the cost of third-party testing of two units per validation class (as required in 10 CFR 429.70(c)(2)(iv)). DOE estimated the additional per basic model cost to determine efficiency using an AEDM assuming 1 hour per basic model at the cost of an engineering calibration technician wage of $46 per hour.

1. Description of Why Action Is Being Considered

DOE is proposing to amend the existing DOE test procedures for CWAFs in satisfaction of the 7-year review requirement specified in EPCA. (42 U.S.C. 6314(a)(1)(A)(ii)).

2. Objective of, and Legal Basis for, Rule

EPCA 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 C [32] of EPCA, added by Public Law 95–619, Title IV, section 441(a), established the Energy Conservation Program for Certain Industrial Equipment, which sets forth a variety of provisions designed to improve energy efficiency. (42 U.S.C. 6311–6317) This equipment includes CWAFs, the subject of this document. (42 U.S.C. 6311(1)(J))

Further, if such an industry test procedure is amended, DOE must amend its test procedure to be consistent with the amended industry test procedure, unless DOE determines, by rule published in the **Federal Register** and supported by clear and convincing evidence, that such amended test procedure would not meet the requirements in 42 U.S.C. 6314(a)(2) and (3) related to representative use and test burden. (42 U.S.C. 6314(a)(4)(B))

EPCA also requires that, at least once every 7 years, DOE evaluate test procedures for each type of covered equipment, including CWAFs, 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. (42 U.S.C. 63146314(a)(1)(A))

3. Description and Estimate of Small Entities Regulated

For manufacturers of CWAFs, the Small Business Administration (''SBA'') has set a size threshold, which defines those entities classified as ''small businesses'' for the purposes of the statute. DOE used the SBA's small business size standards to determine whether any small entities would be subject to the requirements of the rule. *See* 13 CFR part 121. The equipment covered by this rule are classified under North American Industry Classification System (''NAICS'') code 333415,[33] ''Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing.'' In 13 CFR 121.201, the SBA sets a threshold of 1,250 employees or fewer for an entity to be considered as a small business for this category.

DOE reviewed the test procedures proposed in this NOPR under the provisions of the Regulatory Flexibility Act and the procedures and policies published on February 19, 2003. DOE's analysis relied on publicly available databases to identify potential small businesses that manufacture equipment covered in this rulemaking. DOE utilized the California Energy Commission's Modernized Appliance Efficiency Database System (''MAEDbS''),[34] EPA's ENERGY STAR Database,[35] and the DOE's Certification Compliance Database (''CCD'') [36] to identify to manufacturers. DOE identified eight original equipment manufacturers (''OEMs'') of CWAFs affected by this rulemaking. DOE screened out companies that do not meet the definition of a ''small business'' or are foreign-owned and operated. Of these eight OEMs, DOE identified one small, domestic OEM for consideration. DOE used subscription-based business information tools to determine headcount and revenue of the small business.

4. Description and Estimate of Compliance Requirements

In this NOPR, DOE proposes to amend the existing test procedure for CWAFs when determining TE by incorporating by reference the most up-to-date versions of the industry standards currently referenced in the DOE test procedure, and to provide additional detail for the test setup for models with multiple vent hoods and models with vent hoods having space limitations. DOE proposes to update appendix A (formerly 10 CFR 431.76), ''Uniform test method for the measurement of energy efficiency of commercial warm air furnaces'' as follows:

(1) Incorporate by reference UL 727–2018 (previously UL 727–2006) for testing oil-fired CWAFs;

(2) Incorporate by reference AHRI 1500–2015 (previously HI BTS–2000) for performing fuel oil analysis and for calculating flue loss of oil-fired CWAFs;

(3) Incorporate by reference ANSI Z21.47–2021 (previously ANSI Z21.47–2012) for testing gas-fired CWAFs;

(4) Incorporate by reference ANSI/ASHRAE 103–2017 (previously ANSI/ASHRAE 103–2007) for testing condensing gas-fired CWAFs;

(5) Incorporate by reference the standards referenced in UL 727–2018 (*i.e.,* NFPA 97–2003), AHRI 1500–2015 (*i.e.,* ASTM D396–14a, ASTM D240–09, ASTM D4809–09a, and ASTM D5291–10), and ANSI Z21.47–2021 (*i.e.,* ANSI/ASME PTC 19.3–1974 (R2004)) that are necessary in performing the DOE test procedure;

(6) Clarify how to test units with multiple vent hoods, and units with vent hoods that are 2 inches in diameter or smaller; and

DOE also proposes to establish a new test procedure and metric for ''TE2'' in a new appendix B to 10 CFR 431.72, which manufacturers could use to make voluntary representations, and which would be mandatory only at such time as compliance is required with amended energy conservation standards based on TE2, should DOE adopt such standards. The proposed new TE2 metric accounts for flue losses in a manner identical to the existing TE metric, and accounts for jacket losses and part-load operation.

Items (1) through (5) incorporate by reference the most up-to-date versions of the industry standards currently referenced in the DOE test procedure. Item (6) includes clarifications intended to improve consistency and reproducibility of test procedure results. The industry test procedure ANSI Z21.47 does not specify how to test units with multiple vent hoods or units with vent hoods that are too small to fit the required number of thermocouples. DOE is proposing to add clarifications and guidance to address these scenarios. DOE has tentatively determined that these proposed amendments in this NOPR would improve the representativeness, accuracy, and reproducibility of the test results and would not increase third-party laboratory testing costs.

In item (7), DOE proposes to adopt appendix B, which includes the relevant test procedure requirements for measuring TE2, an efficiency metric proposed by DOE which incorporates jacket loss and CWAF performance at reduced firing rates. The proposed NOPR amendments would not require

[32] For editorial reasons, upon codification in the U.S. Code, Part C was redesignated Part A–1.

[33] The size standards are listed by NAICS code and industry description and are available at: *www.sba.gov/document/support—table-size-standards* (Last accessed July 16, 2021).

[34] MAEDbS can be accessed at *www.cacertappliances.energy.ca.gov/Pages/Search/AdvancedSearch.aspx* (Last accessed July 15, 2021).

[35] ENERGY STAR-certified products can be found in the ENERGY STAR database accessed at *www.energystar.gov/productfinder/product/certified-commercial-water-heaters/results* (Last accessed July 15, 2021).

[36] Certified equipment in the CCD are listed by product class and can be accessed at *www.regulations.doe.gov/certification-data/#q=Product_Group_s%3A** (Last accessed July 15, 2021).

manufacturers to re-rate models, as DOE energy conservation standards do not currently require TE2 ratings. As such, the test procedure amendments do not result in industry costs.

Should DOE adopt energy conservation standards based on the TE2 metric in proposed appendix B in the future, DOE anticipates manufacturers would incur costs to re-rate models as result of the standards. DOE expects the proposed test procedure in appendix B for measuring TE2 would increase testing costs compared to the current DOE test procedure. The current DOE test procedure costs approximately $4,200 per unit for third-party laboratory testing. DOE estimates the cost for third-party laboratory testing according to the proposed appendix B to be $6,400 per unit.

If CWAF manufacturers conduct testing to certify a basic model, two units are required to be tested per basic model. The test cost, according to the proposed amendments, would be $12,800 per basic model.[37] However, manufacturers are not required to perform laboratory testing on all basic models, as CWAF manufacturers may elect to use AEDMs.[38] An AEDM is a computer modeling or mathematical tool that predicts the performance of non-tested basic models. These computer modeling and mathematical tools, when properly developed, can provide a means to predict the energy usage or efficiency characteristics of a basic model of a given covered product or equipment and reduce the burden and cost associated with testing. DOE estimates the cost to develop and validate an AEDM for CWAFs to be $17,300, which includes testing of two models per validation class. Additionally, DOE estimates a cost of approximately $46 per basic model for determining energy efficiency using the validated AEDM.

DOE estimates the range of potential costs for the one domestic, small OEM. When developing cost estimates for the small OEM, DOE considers the cost to develop the AEDM simulation tool, the costs to validate the AEDM through testing, and the cost to rate basic models using the AEDM.

DOE research indicates that the one small manufacturer has average annual revenues of $3.3 million. DOE understands this OEM to manufacture four basic models. Therefore, DOE estimates that the associated re-rating costs for this manufacturer to be approximately $17,400 when making use of AEDMs. The cost for this small manufacturer to re-rate all basic models is estimated to be less than 1 percent of annual revenue.

DOE requests comment on the number of small OEMs DOE identified. DOE also seeks comment on the potential costs this small manufacturer may incur.

5. Duplication Overlap, and Conflict With Other Rules and Regulations

DOE is not aware of any rules or regulations that duplicate, overlap, or conflict with the rule being considered today.

6. Significant Alternatives to the Rule

DOE proposes to reduce burden on manufacturers, including small businesses, by allowing AEDMs in lieu of physically testing all basic models. The use of an AEDM is less costly than physical testing of CWAF models. Without AEDMs, DOE estimates the cost to physically test all CWAF basic models for the identified small manufacturer to be approximately $51,200.

Additional compliance flexibilities may be available through other means. EPCA provides that a manufacturer whose annual gross revenue from all of its operations does not exceed $8 million may apply for an exemption from all or part of an energy conservation standard for a period not longer than 24 months after the effective date of a final rule establishing the standard. (42 U.S.C. 6295(t)) Additionally, manufacturers subject to DOE's energy efficiency standards may apply to DOE's Office of Hearings and Appeals for exception relief under certain circumstances. Manufacturers should refer to 10 CFR part 430, subpart E, and 10 CFR part 1003 for additional details.

C. Review Under the Paperwork Reduction Act of 1995

Manufacturers of CWAFs 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 CWAFs. (*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.

D. Review Under the National Environmental Policy Act of 1969

In this NOPR, DOE proposes test procedure amendments that it expects will be used to develop and implement future energy conservation standards for CWAFs. DOE has determined that this rule falls into a class of actions that are categorically excluded from review under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*) and DOE's implementing regulations at 10 CFR part 1021. Specifically, DOE has determined that adopting test procedures for measuring energy efficiency of consumer products and industrial equipment is consistent with activities identified in 10 CFR part 1021, appendix A to subpart D, A5 and A6. Accordingly, neither an environmental assessment nor an environmental impact statement is required.

E. Review Under Executive Order 13132

Executive Order 13132, ''Federalism,'' 64 FR 43255 (Aug. 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

[37] The cost to test one unit is $6,400. The cost to test two units is $12,800.

[38] In accordance with 10 CFR 429.70.

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. 4316(b); 42 U.S.C. 6297(d)) No further action is required by Executive Order 13132.

F. Review Under Executive Order 12988

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

G. Review Under the Unfunded Mandates Reform Act of 1995

Title II of the Unfunded Mandates Reform Act of 1995 (''UMRA'') requires each Federal agency to assess the effects of Federal regulatory actions on State, local, and Tribal governments and the private sector. Public Law 104–4, sec. 201 (codified at 2 U.S.C. 1531). For a 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 *https://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.

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

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

I. Review Under Executive Order 12630

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

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

Section 515 of the Treasury and General Government Appropriations Act, 2001 (44 U.S.C. 3516 note) provides for agencies to review most disseminations of information to the public under guidelines established by each agency pursuant to general guidelines issued by OMB. OMB's guidelines were published at 67 FR 8452 (Feb. 22, 2002), and DOE's guidelines were published at 67 FR 62446 (Oct. 7, 2002). Pursuant to OMB Memorandum M–19–15, Improving Implementation of the Information Quality Act (April 24, 2019), DOE published updated guidelines which are available at *www.energy.gov/sites/prod/files/2019/12/f70/DOE%20Final%20Updated%20IQA%20Guidelines%20Dec%202019.pdf.* 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.

K. Review Under Executive Order 13211

Executive Order 13211, ''Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use,'' 66 FR 28355 (May 22, 2001), requires Federal agencies to prepare and submit to OMB, a Statement of Energy Effects for any 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 CWAFs is not a significant regulatory action under Executive Order 12866. Moreover, it would not have a significant adverse effect on the supply, distribution, or use of energy, nor has it been designated as a significant energy action by the Administrator of OIRA. Therefore, it is not a significant energy action, and, accordingly, DOE has not prepared a Statement of Energy Effects.

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

Under section 301 of the Department of Energy Organization Act (Pub. L. 95–

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

The proposed modifications to the test procedure for CWAF would incorporate testing methods contained in certain sections of the following commercial standards: UL 727–2018, AHRI 1500–2015 ANSI Z21.47–2021, and ANSI/ASHRAE 103–2017. DOE has evaluated these standards and is unable to conclude whether they fully comply with the requirements of section 32(b) of the FEAA (*i.e.,* whether it was developed in a manner that fully provides for public participation, comment, and review). DOE will consult with both the Attorney General and the Chairman of the FTC concerning the impact of these test procedures on competition, prior to prescribing a final rule.

M. Description of Materials Incorporated by Reference

In this NOPR, DOE proposes to incorporate by reference the following standards:

(1) UL 727–2018. This test standard provides instruction for how to test oil-fired CWAFs.

Copies of UL 727–2018 can be obtained from Underwriters Laboratories, Inc., 2600 NW. Lake Rd., Camas, WA 98607–8542, (360) 817–5500 or online at: *standardscatalog.ul.com.*

(2) ANSI Z21.47–2021. This test standard provides instruction for how to test gas-fired CWAFs.

(3) ASHRAE 103–2017. This test standard provides instruction for how to test residential furnaces and boilers, which DOE is referencing for the purpose of providing instruction for testing condensing gas-fired CWAFs.

(4) ANSI/ASME PTC 19.3–1974 (R2004). This standard is also referenced as ANSI Z21.47–2021, and it specifies thermocouple requirements for when testing gas-fired CWAFs.

Copies of ANSI Z21.47–2021, ANSI/ASHRAE 103–2017 and ANSI/ASME PTC 19.3–1974 (R2004), can be obtained from 25 W 43rd Street, 4th Floor, New York, NY 10036, (212) 642–4900, or online at: *webstore.ansi.org.*

(5) AHRI 1500–2015. This test standard provides instruction for how to test perform fuel oil analysis and for how to calculate flue loss of oil-fired CWAFs.

Copies of AHRI 1500–2015 can be obtained from 2111 Wilson Blvd., Suite 500, Arlington, VA 22201, (703) 524–8800, or online at: *ahrinet.org.*

(6) NFPA 97–2003. This standard is referenced in UL 727–2018, and it provides definitions for the terms combustible and noncombustible.

Copies of NFPA 97–2003 can be obtained form 1 Batterymarch Park, Quincy, MA 02169–7471, (617) 770–3000 or by going online at: *www.nfpa.org.*

(7) ANSI/ASTM E230/E230M–17. This standard is referenced in UL 727–2018, and it specifies thermocouple requirements for when testing oil-fired CWAFs.

(8) ASTM D396–14a. This standard is referenced in AHRI 1500–2015, and it contains general fuel oil requirements.

(9) ASTM D240–09. This standard is referenced in AHRI 1500–2015, and it contains fuel oil heating value requirements.

(10) ASTM D4809–09a. This standard is referenced in AHRI 1500–2015, and it contains fuel oil hydrogen and carbon content requirements.

(11) ASTM D5291–10. This standard is referenced in AHRI 1500–2015, and it contains fuel oil density requirements.

Copies of ANSI/ASTM E230/E230M–17, ASTM D240–09, ASTM D396–14a, ASTM D4809–09a, and ASTM D5291–10, can be obtained from 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428, (877) 909–2786 or by going online at: *www.astm.org.*

V. Public Participation

A. Participation in the Webinar

The time and date of the webinar meeting are listed in the **DATES** section at the beginning of this document. If no participants register for the webinar, it will be cancelled. Webinar registration information, participant instructions, and information about the capabilities available to webinar participants will be published on DOE's website: *www1.eere.energy.gov/buildings/appliance_standards/standards.aspx?productid=49&action=viewlive* Participants are responsible for ensuring their systems are compatible with the webinar software.

B. Procedure for Submitting Prepared General Statements for Distribution

Any person who has an interest in the topics addressed in this proposed rule, or who is representative of a group or class of persons that has an interest in these issues, may request an opportunity to make an oral presentation at the webinar. Such persons may submit to *Appliance StandardsQuestions@ee.doe.gov.* Persons who wish to speak should include with their request a computer file in WordPerfect, Microsoft Word, PDF, or text (ASCII) file format that briefly describes the nature of their interest in this rulemaking and the topics they wish to discuss. Such persons should also provide a daytime telephone number where they can be reached.

Persons requesting to speak should briefly describe the nature of their interest in this rulemaking and provide a telephone number for contact. DOE requests persons selected to make an oral presentation to submit an advance copy of their statements at least two weeks before the webinar. At its discretion, DOE may permit persons who cannot supply an advance copy of their statement to participate, if those persons have made advance alternative arrangements with the Building Technologies Office. As necessary, requests to give an oral presentation should ask for such alternative arrangements.

C. Conduct of the Webinar

DOE will designate a DOE official to preside at the webinar/public meeting and may also use a professional facilitator to aid discussion. The meeting will not be a judicial or evidentiary-type public hearing, but DOE will conduct it in accordance with section 336 of EPCA (42 U.S.C. 6306). A court reporter will be present to record the proceedings and prepare a transcript. DOE reserves the right to schedule the order of presentations and to establish the procedures governing the conduct of the webinar/public meeting. There shall not be discussion of proprietary information, costs or prices, market share, or other commercial matters regulated by U.S. anti-trust laws. After the webinar/public meeting and until the end of the comment period, interested parties may submit further comments on the proceedings and any aspect of the rulemaking.

The webinar will be conducted in an informal, conference style. DOE will present a general overview of the topics addressed in this rulemaking, allow

time for prepared general statements by participants, and encourage all interested parties to share their views on issues affecting this rulemaking. Each participant will be allowed to make a general statement (within time limits determined by DOE), before the discussion of specific topics. DOE will permit, as time permits, other participants to comment briefly on any general statements.

At the end of all prepared statements on a topic, DOE will permit participants to clarify their statements briefly. Participants should be prepared to answer questions by DOE and by other participants concerning these issues. DOE representatives may also ask questions of participants concerning other matters relevant to this rulemaking. The official conducting the webinar/public meeting will accept additional comments or questions from those attending, as time permits. The presiding official will announce any further procedural rules or modification of the above procedures that may be needed for the proper conduct of the webinar/public meeting.

A transcript of the webinar will be included in the docket, which can be viewed as described in the Docket section at the beginning of this document. In addition, any person may buy a copy of the transcript from the transcribing reporter.

D. Participation in the Webinar

DOE will accept comments, data, and information regarding this proposed rule no later than the date provided in the **DATES** section at the beginning of this proposed rule. Interested parties may submit comments using any of the methods described in the **ADDRESSES** section at the beginning of this document.

Submitting comments via www.regulations.gov. The *www.regulations.gov* web page will require you to provide your name and contact information. 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 *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 *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 *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 *www.regulations.gov* provides after you have successfully uploaded your comment.

Submitting comments via email. Comments and documents submitted via email also will be posted to *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 each time you submit comments, data, documents, and other information to DOE. No faxes will be accepted.

Comments, data, and other information submitted to DOE electronically should be provided in PDF (preferred), Microsoft Word or Excel, 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. Pursuant 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 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. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

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).

E. Issues on Which DOE Seeks Comment

Although DOE welcomes comments on any aspect of this proposal, DOE is particularly interested in receiving comments and views of interested parties concerning the following issues:

(1) DOE seeks comment on its tentative conclusion that NFPA 97M is an outdated standard that has been superseded by NFPA 97–2003. DOE seeks comment on its proposal to incorporate by reference NFPA 97–2003 in 10 CFR part 431, subpart D.

(2) DOE seeks comment on its proposal to adopt the optional method specified in AHRI 1500–2015 that allows for calculating CO_2 using a measured O_2 value. DOE also seeks comment on its proposal to establishestablish section 3 of appendix A (*i.e.,* an update of 10 CFR 431.76(d) of the current DOE test procedure) to accommodate the option to calculate CO_2 using a measured O_2 value.

(3) DOE seeks comment on whether the option provided in Section 5.4a of ANSI Z21.47–2021 to use test gas H when performing the three burner characteristics tests would impact the representativeness or burden of the thermal efficiency test.

(4) DOE seeks comment on its proposal to establish a new test procedure (*i.e.,* appendix B) and metric (*i.e.,* TE2) for CWAFs, which would generally adopt the same changes proposed for the current test procedure at appendix A and account for flue losses in the same manner as the current

TE metric, but would additionally account for jacket losses and part load operation.

(5) DOE seeks comment on its proposal to require jacket loss be measured when testing CWAFs designed for outdoor installation and designed for indoor installation within an unheated space when determining TE2 pursuant to newly proposed appendix B, and on its proposed method for measuring jacket loss. DOE also seeks comment on its proposal that jacket loss for CWAFs intended for indoor installation within a heated space would be assumed to be zero, and on its proposed jacket loss factors for CWAFs designed for outdoor installation and designed for indoor installation within an unheated space.

(6) DOE seeks comment on its proposal to add a part-load test procedure to be incorporated into the newly proposed TE2 metric. DOE also seeks comment on its proposal to calculate TE2 by averaging performance at the maximum and minimum fire rate and seeks and any related data. DOE also requests comment on alternate weighting values, including those discussed, that may be more nationally representative of an average use, along with any relevant data.

(7) DOE seeks comment on its proposal to provide instructions in the DOE test procedure for testing units with multiple vent hoods.

(8) DOE seeks comment on its assumption that the amount (*i.e.,* mass flow) of flue exhaust exiting each vent hood is proportional to the size of the vent hood. Furthermore, DOE seeks comment on its proposal to compare vent hood outlet face areas to determine vent hood size.

(9) DOE seeks comment on the proposal to specify in the DOE test procedure that when testing gas- and oil-fired CWAFs, the flue gas temperatures shall be measured in the vent hood using nine individual thermocouples, or if the vent hood is 2 inches or smaller in diameter, five thermocouples may optionally be used.

(10) DOE seeks comment on its proposal to require the calculation method specified in Annex I of ANSI Z21.47–2021 be used when determining flue loss, and not the nomograph method.

(11) DOE seeks comment on its understanding of the impact of the test procedure proposals in this NOPR, specifically with respect to DOE's estimated test costs, and DOE's initial conclusion regarding the testing costs associated with the proposed test procedure for TE2 as compared to the current test procedure.

(12) DOE requests comment on the number of small OEMs DOE identified. DOE also seeks comment on the potential costs this small manufacturer may incur.

VI. Approval of the Office of the Secretary

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

List of Subjects in 10 CFR Part 431

Administrative practice and procedure, Confidential business information, Energy conservation test procedures, Incorporation by reference, and Reporting and recordkeeping requirements.

Signing Authority

This document of the Department of Energy was signed on February 11, 2022, by Kelly J. Speakes-Backman, Principal Deputy Assistant Secretary, Energy Efficiency and Renewable Energy, pursuant to delegated authority from the Secretary of Energy. That document with the original signature and date is maintained by DOE. For administrative purposes only, and in compliance with requirements of the Office of the Federal Register, the undersigned DOE Federal Register Liaison Officer has been authorized to sign and submit the document in electronic format for publication, as an official document of the Department of Energy. This administrative process in no way alters the legal effect of this document upon publication in the **Federal Register**.

Signed in Washington, DC, on February 14, 2022.

Treena V. Garrett,

Federal Register Liaison Officer, U.S. Department of Energy.

For the reasons stated in the preamble, DOE is proposing to amend 10 CFR part 431 as set forth below:

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

■ 1. The authority citation for part 431 continues to read as follows:

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

■ 2. Amend § 431.72 by adding, in alphabetical order, a definition for ''Thermal efficiency two'' to read as follows:

§ 431.72 Definitions concerning commercial warm air furnaces.

* * * * *

Thermal efficiency two for a commercial warm air furnace equals 100 percent minus percent flue loss and jacket loss.

* * * * *

■ 3. Revise § 431.75 to read as follows:

§ 431.75 Materials incorporated by reference.

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

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

(1) ANSI/AHRI 1500–2015 (''AHRI 1500–2015''), ''Performance Rating of Commercial Space Heating Boilers'', approved November 28, 2014; IBR approved for appendices A and B to this subpart.

(2) [Reserved]

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

(1) ANSI Z21.47–2021,''Gas-fired Central Furnaces'', approved April 21, 2021; IBR approved for appendices A and B to this subpart.

(2) [Reserved]

(c) *ASHRAE.* American Society of Heating, Refrigerating and Air-Conditioning Engineers Inc., 1791 Tullie Circle NE, Atlanta, Georgia 30329, (404) 636–8400, or go to: *www.ashrae.org.*

(1) ANSI/ASHRAE Standard 103–2017 (''ASHRAE 103–2017''), ''Method of Testing for Annual Fuel Utilization Efficiency of Residential Central Furnaces and Boilers'', approved June 30, 2017; IBR approved for appendices A and B to this subpart.

(2) [Reserved]

(d) *ASME.* American Society of Mechanical Engineers, Service Center, 22 Law Drive, P.O. Box 2900, Fairfield, NJ 07007, (973) 882–1170, or go to *www.asme.org.*

(1) ANSI/ASME PTC 19.3–1974 (R2004) (''ASME PTC 19.3–1974 (R2004)''), ''Part 3: Temperature Measurement, Instruments and Apparatus'', published January 1, 2004; IBR approved for appendices A and B to this subpart.

(2) [Reserved]

(e) *ASTM.* ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428, (877) 909–2786, or go to *www.astm.org/.*

(1) ANSI/ASTM E230/E230M–17 (''ASTM E230/E230M–17''), ''Standard Specification for Temperature-Electromotive Force (emf) Tables for Standardized Thermocouples'', approved November 1, 2017, IBR approved for appendices A and B to this subpart.

(2) ASTM D240–09, ''Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter'', approved July 1, 2009; IBR approved for appendices A and B to this subpart.

(3) ASTM D396–14a, ''Standard Specification for Fuel Oils,'' approved on October 1, 2014; IBR approved for appendices A and B to this subpart.

(4) ASTM D4809–09a, ''Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter (Precision Method)''; IBR approved for appendices A and B to this subpart.

(5) ASTM D5291–10, ''Standard Test Methods for Instrumental Determination of Carbon, Hydrogen, and Nitrogen in Petroleum Products and Lubricants'', approved on May 1, 2010; IBR approved for appendices A and B to this subpart.

(f) *NFPA.* National Fire Protection Association, 11 Tracy Drive, Avon, MA 02322, 1–800–344–3555, or go to *www.nfpa.org.*

(1) NFPA 97–2003, ''Standard Glossary of Terms Relating to Chimneys, Vents, and Heat-Producing Appliances''; IBR approved for appendices A and B to this subpart.

(2) [Reserved]

(g) *UL.* Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062, (847) 272–8800, or go to: *www.ul.com.*

(1) UL 727 (''UL 727–2018''), ''Standard for Safety Oil-Fired Central Furnaces'', Tenth Edition, published January 31, 2018; IBR approved for appendices A and B to this subpart.

(2) [Reserved]

■ 4. Revise § 431.76 to read as follows:

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

(a) *Scope.* This section prescribes the test requirements used to measure the energy efficiency of commercial warm air furnaces with a rated maximum input of 225,000 Btu per hour or more.

(b) *Testing and calculations.* (1) *Thermal efficiency.* Test in accordance with appendix A to subpart D of this part when making representations of thermal efficiency.

(2) *Thermal efficiency two.* Test in accordance with appendix B to subpart D of this part when making representations of thermal efficiency two.

■ 5. Add appendix A to subpart D of part 431 to read as follows:

Appendix A to Subpart D of Part 431—Uniform Test Method for the Measurement Energy Efficiency of Commercial Warm Air Furnaces (Thermal Efficiency)

Note: On and after [date 360 days following publication of a final rule], any representations made with respect to the energy use or efficiency of commercial warm air furnaces must be made in accordance with the results of testing pursuant to this section. At that time, manufacturers must use the relevant procedures specified in this appendix, which reference ANSI Z21.47–2021, ASHRAE 103–2017, UL 727–2018, or AHRI 1500–2015. On and after [effective date 30 days following publication of a final rule] and prior to [date 360 days following publication of a final rule], manufacturers must test commercial warm air furnaces in accordance with this appendix or 10 CFR 431.76 (revised as of January 1, 2020). DOE notes that, because testing under this section is required as of [date 360 days following publication of a final rule], manufacturers may wish to begin using this amended test procedure immediately. Any representations made with respect to the energy use or efficiency of such commercial warm air furnaces must be made in accordance with whichever version is selected.

1. Incorporation by reference. DOE incorporates by reference in § 431.75, the entirety of standards AHRI 1500–2015, ANSI Z21.47–2021, ASHRAE 103–2017, ASME PTC 19.3–1974 (R2004), ASTM E230/E230M–17, ASTM D240–09, ASTM D396–14a, ASTM D4809–09a, ASTM D5291–10, NFPA 97–2003, and UL 727–2018. However, for standards ANSI Z21.47–2021, ASHRAE 103–2017, UL 727–2018, and AHRI 1500–2015, only the enumerated provisions of those documents apply to this appendix, as follows:

1.1 ANSI Z21.47–2021

1.1.1 Sections 5.1, 5.1.4, 5.2, 5.3, 5.4, 5.5, 5.5.1, 5.6, and 7.2.1 of ANSI Z21.47–2021 as specified in section 2.1 of this appendix;

1.1.2 Section 5.40 as specified in sections 2.1 and 3.1 of this appendix; 1.1.3 Section 5.2.8 as specified in section 5.1 of this appendix;

1.1.4 Annex I as specified in section 4.1 of this appendix.

1.2 ASHRAE 103–2017

1.2.1 Sections 7.2.2.4, 7.8, and 9.2 of ASHRAE 103–2017 as specified in section 3.2 of this appendix;

1.2.2 Figure 10 of ASHRAE 103–2017 as specified in section 2.3.1 of this appendix.

1.2.3 Sections 11.3.7.1 and 11.3.7.2 of ASHRAE 103–2017 as specified in section 5.1 of this appendix.

1.3 UL 727–2018

1.3.1 Sections 2, 3, 37, 38 and 39, 40, 40.6, 41, 42, 43.2, 44, 45, and 46 of UL 727–2018 as specified in section 2.2 of this appendix;

1.3.2 Figure 40.3 of UL 727–2018 as specified in section 3.1 of this appendix.

1.4 AHRI 1500–2015

1.4.1 Section C3.2.1.1 of AHRI 1500–2015 as specified in section 2.2 of this appendix; 1.4.2 Sections C7.2.4, C7.2.5, and C7.2.6.2 of the AHRI 1500–2015of section 4.2 of this appendix.

2. Test set-up and Testing. Where this section prescribes use of ANSI Z21.47–2021 or UL 727–2018, perform only the procedures pertinent to the measurement of the steady-state efficiency, as specified in this section.

2.1 *Gas-fired commercial warm air furnaces.* The test set-up, including flue requirement, instrumentation, test conditions, and measurements for determining thermal efficiency are as specified in section 2.3 of this appendix, and the following sections of ANSI Z21.47–2021: 5.1 (General, including ASME PTC 19.3–1974 (R2004) as referenced in Section 5.1.4), 5.2 (Basic test arrangements), 5.3 (Test ducts and plenums), 5.4 (Test gases), 5.5 (Test pressures and burner adjustments), 5.6 (Static pressure and air flow adjustments), 5.40 (Thermal efficiency), and 7.2.1 (Basic test arrangements for direct vent central furnaces). If section 2.3 of this appendix and ANSI Z21.47–2021 have conflicting provisions (*e.g.,* the number of thermocouples that should be used when testing units with vent hoods two inches in diameters or smaller), follow the provisions in section 2.3. The thermal efficiency test must be conducted only at the normal inlet test pressure, as specified in Section 5.5.1 of ANSI Z21.47–2021, and at the maximum hourly Btu input rating specified by the manufacturer for the product being tested.

2.2 *Oil-fired commercial warm air furnaces.* The test setup, including flue requirement, instrumentation, test conditions, and measurement for measuring thermal efficiency is as specified in section 2.3 of this appendix and the following sections of UL 727–2018: 2 (Units of Measurement), 3 (Glossary, except that the definitions for combustible and non-combustible in Sections 3.11 and 3.27 shall be as referenced in NFPA 97–2003), 37 (General), 38 and 39 (Test Installation), 40 (Instrumentation, except 40.4 and 40.6.2 through 40.6.7 which are not required for the thermal efficiency test, and including ASTM E230/E230M–17 as referenced in Sections 40.6), 41 (Initial Test Conditions), 42 (Combustion Test—Burner and Furnace), 43.2 (Operation Tests), 44 (Limit Control

Cutout Test), 45 (Continuity of Operation Test), and 46 (Air Flow, Downflow or Horizontal Furnace Test). If section 2.3 of this appendix and UL 727 have conflicting provisions (*e.g.,* the number of thermocouples that should be used when testing units with vent hoods two inches in diameters or smaller), follow the provisions in section 2.3 of this appendix. Conduct a fuel oil analysis for heating value, hydrogen content, carbon content, pounds per gallon, and American Petroleum Institute (API) gravity as specified in Section C3.2.1.1 of AHRI 1500–2015, including the applicable provisions of ASTM D240–09, ASTM D4809–09a, ASTM D5291–10, and ASTM D396–14a, as referenced. The steady-state combustion conditions, specified in Section 42.1 of UL 727–2018, are attained when variations of not more than 5 °F in the measured flue gas temperature occur for three consecutive readings taken 15 minutes apart.

2.3 *Additional test set up requirements for gas-fired and oil-fired commercial warm air furnaces*

2.3.1 *Thermocouple setup for gas and oil-fired commercial warm air furnaces with flue vents that are two inches in diameter or smaller.* For units with vent hoods (*i.e.,* flue outlet hoods) two inches in diameter or smaller, the flue gas temperatures may optionally be measured using five individual thermocouples, instead of nine thermocouples.

2.3.2 *Procedure for flue gas measurements when testing units with multiple vent hoods.* For units that have multiple vent hoods record flue gas measurements (*e.g.,* flue gas temperature, CO_2 in the flue gasses) separately for each individual vent hood and calculate a weighted-average value based on the readings of all vent hoods. To determine the weighted average for each measurement, first calculate the face area of each vent hood. Then multiply the ratio of each individual vent hood's face area to the total face area of all vent hoods (*i.e.,* the face area of each individual vent hood divided by the total vent hood area) by that vent hood's respective component measurement and the sum of all of the products for all of the vent hoods to determine the weighted-average values. Use the weighted-average values to determine flue loss, and whether equilibrium conditions are met before the official test period.

3. Additional test measurements

3.1 *Determination of flue CO_2 (carbon dioxide) or O_2 (oxygen) for oil-fired commercial warm air furnaces.* In addition to the flue temperature measurement specified in Section 40.6.8 of UL 727–2018, locate one or two sampling tubes within six inches downstream from the flue temperature probe (as indicated on Figure 40.3 of UL 727–2018). If an open end tube is used, it must project into the flue one-third of the chimney connector diameter. If other methods of sampling the flue gas are used place the sampling tube so as to obtain an average sample. There must be no air leak between the temperature probe and the sampling tube location. Collect the flue gas sample at the same time the flue gas temperature is recorded. The CO_2 or O_2 concentration of the flue gas must be as specified by the manufacturer for the product being tested, with a tolerance of ±0.1 percent. Determine the flue CO_2 or O_2 using an instrument with a reading error no greater than ±0.1 percent.

3.2 *Procedure for the measurement of condensate for a gas-fired condensing commercial warm air furnace.* The test procedure for the measurement of the condensate from the flue gas under steady-state operation must be conducted as specified in Sections 7.2.2.4, 7.8, and 9.2 of ASHRAE 103–2017 under the maximum rated input conditions. This condensate measurement must be conducted for an additional 30 minutes of steady-state operation after completion of the steady-state thermal efficiency test specified in Section 2.1 of this appendix.

4. Calculation of thermal efficiency

4.1 *Gas-fired commercial warm air furnaces.* Use the calculation procedure specified in Section 5.40, Thermal efficiency, of ANSI Z21.47–2021. When determining the flue loss that is used in the calculation of thermal efficiency, the calculation method specified in Annex I shall be used.

4.2 *Oil-fired commercial warm air furnaces.* Calculate the percent flue loss (in percent of heat input rate) by following the procedure specified in Sections C7.2.4, C7.2.5, and C7.2.6.2 of the AHRI 1500–2015. The thermal efficiency must be calculated as: Thermal Efficiency (percent) = 100 percent − flue loss (in percent).

5. Procedure for the calculation of the additional heat gain and heat loss, and adjustment to the thermal efficiency, for a condensing commercial warm air furnace.

5.1 Calculate the latent heat gain from the condensation of the water vapor in the flue gas, and calculate heat loss due to the flue condensate down the drain, as specified in Sections 11.3.7.1 and 11.3.7.2 of ASHRAE 103–2017, with the exception that in the equation for the heat loss due to hot condensate flowing down the drain in Section 11.3.7.2, the assumed indoor temperature of 70 °F and the temperature term TOA must be replaced by the measured room temperature as specified in Section 5.2.8 of ANSI Z21.47–2021.

5.2 *Adjustment to the thermal efficiency for condensing furnaces.* Adjust the thermal efficiency as calculated in section 4.1 of this appendix by adding the latent gain, expressed in percent, from the condensation of the water vapor in the flue gas, and subtracting the heat loss (due to the flue condensate down the drain), also expressed in percent, both as calculated in section 5.1 of this appendix, to obtain the thermal efficiency of a condensing furnace.

■ 6. Add appendix B to subpart D of part 431 to read as follows:

Appendix B to Subpart D of Part 431–Uniform Test Method for the Measurement Energy Efficiency of Commercial Warm Air Furnaces (Thermal Efficiency Two)

Note: Representations with respect to energy use or efficiency of this equipment, including compliance certifications, must be made in terms of thermal efficiency (TE), as determined by the test procedure specified in appendix A to this subpart. In addition, manufacturers may optionally make representations of energy use or efficiency of this equipment using thermal efficiency 2 (TE2) as determined using this appendix [on or after effective date 30 days after publication of final rule].

1. Incorporation by Reference. DOE incorporates by reference in § 431.75, the entirety of standards AHRI 1500–2015, ANSI Z21.47–2021, ASHRAE 103–2017, ASME PTC 19.3–1974 (R2004), ASTM E230/E230M–17, ASTM D240–09, ASTM D396–14a, ASTM D4809–09a, ASTM D5291–10, NFPA 97–2003, and UL 727–2018. However, for standards ANSI Z21.47–2021, ASHRAE 103–2017, UL 727–2018, and AHRI 1500–2015, only the enumerated provisions of those documents apply to this appendix, as follows:

1.1 ANSI Z21.47–2021

1.1 Sections 5.1, 5.1.4, 5.2, 5.3, 5.4, 5.5, 5.5.1, 5.6, and 7.2.1 of ANSI Z21.47–2021 as specified in section 2.1 of appendix A to this subpart;

1.1.2 Section 5.40 as specified in sections 2.1 and 3.1 of appendix A to this subpart;

1.1.3 Section 5.2.8 as specified in section 5.1 of appendix A to this subpart;

1.1.4 Annex I as specified in section 4 of appendix A to this subpart;

1.1.5 Annex J as specified in sections 2.2 and 2.6 of this appendix.

1.2 ASHRAE 103–2017

1.2.1 Sections 7.2.2.4, 7.8, and 9.2 of ASHRAE 103–2017 as specified in section 3.2 of appendix A to this subpart;

1.2.2 Figure 10 of ASHRAE 103–2017 as specified in section 2.3.1 of appendix A to this subpart.

1.2.3 Sections 11.3.7.1 and 11.3.7.2 of ASHRAE 103–2017 as specified in section 5.1 of appendix A to this subpart.

1.3 UL 727–2018

1.3.1 Sections 2, 3, 37, 38 and 39, 40, 40.6, 41, 42, 43.2, 44, 45, and 46 of UL 727–2018 as specified in section 2.2 of appendix A to this subpart;

1.3.2 Figure 40.3 of UL 727–2018 as specified in section 3.1 of appendix A to this subpart.

1.4 AHRI 1500–2015

1.4.1 Section C3.2.1.1 of AHRI 1500–2015 as specified in section 2.2 to appendix A of this subpart;

1.4.2 Sections C7.2.4, C7.2.5, and C7.2.6.2 of the AHRI 1500–2015 of section 4.2 of appendix A to this subpart.

2. Testing

2.1 Setup and test the unit according to sections 1 through 5 of appendix A to this subpart, while operating the unit at the maximum nameplate input rate (*i.e.,* full load). Calculate thermal efficiency TE using the procedure specified in sections 4 and 5 of appendix A to this subpart.

2.2 For commercial warm air furnaces that are designed for outdoor installation (including but not limited to CWAFs that are weatherized, or approved for resistance to wind, rain, or snow), or indoor installation

within an unheated space (*i.e.,* isolated combustion systems), determine the jacket loss using Section 5.40 and Annex J of ANSI Z21.47–2021 while the unit is operating at the maximum nameplate input.

2.3 For commercial warm air furnaces that are designed only for indoor insulation within a heated space, jacket shall be zero. For commercial warm air furnaces that are designed for indoor installation within a heated or unheated space, multiply the jacket loss determined in section 2.2 of this appendix by 1.7. For all other commercial warm air furnaces, including commercial warm air furnaces that are designed for outdoor installation (including but not limited to CWAFs that are weatherized, or approved for resistance to wind, rain, or snow), multiply the jacket loss determined in section 2.2 of this appendix by 3.3.

2.4 Subtract the jacket loss determined in section 2.3 of this appendix from the TE determined in section 1.1 of this appendix to determine the full load efficiency.

2.5 Setup and test the unit according to sections 1 through 5 of appendix A to this subpart, while operating the unit at the nameplate minimum input rate (*i.e.,* part load). Calculate TE using the procedure specified in sections 4 and 5 of appendix A to this subpart.

2.6 For commercial warm air furnaces that are designed for outdoor installation (including but not limited to CWAFs that are weatherized, or approved for resistance to wind, rain, or snow), or indoor installation within an unheated space (*i.e.,* isolated combustion systems), determine the jacket loss using Section 5.40 and Annex J of ANSI Z21.47–2021 while the unit is operating at the minimum nameplate input. Alternatively, the jacket loss determined in section 2.2 of this appendix at the maximum nameplate input may be used.

2.7 For commercial warm air furnaces that are designed only for indoor insulation within a heated space, jacket shall be zero. For commercial warm air furnaces that are designed for indoor installation within a heated or unheated space, multiply the jacket loss determined in section 2.6 of this appendix by 1.7. For all other commercial warm air furnaces, including commercial warm air furnaces that are designed for outdoor installation (including but not limited to CWAFs that are weatherized, or approved for resistance to wind, rain, or snow), multiply the jacket loss determined in section 2.6 of this appendix by 3.3.

2.8 Subtract the jacket loss determined in section 2.7 of this appendix from the TE determined in section 2.5 of this appendix to determine the part load efficiency.

2.9 Calculate TE2 by taking the average of the full-load and part-load.

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DEPARTMENT OF ENERGY

10 CFR Part 431

[EERE–2022–BT–TP–0003 and EERE–2022–STD–0001]

RIN 1904–AE95 and 1904–AE97

Energy Conservation Program: Test Procedure for Dedicated-Purpose Pool Pumps and Energy Conservation Standards for Dedicated-Purpose Pool Pumps; Reopening of Comment Period

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

ACTION: Request for information; reopening of public comment period.

SUMMARY: On January 24, 2022, the U.S. Department of Energy (''DOE'') published two requests for information (''RFIs'') regarding dedicated-purpose pool pumps. DOE published a RFI regarding test procedures for dedicated-purpose pool pumps and a RFI regarding energy conservation standards for dedicated-purpose pool pumps. The RFIs each provided an opportunity for submitting written comments, data, and information on the proposal by February 23, 2022. DOE received a request from the Pool and Hut Tub Alliance on February 9, 2022, and a joint request from the Pacific Gas and Electric Company, San Diego Gas and Electric, and Southern California Edison on February 11, 2022, each asking DOE to extend the public comment periods for both RFIs for 30 additional days. DOE has reviewed these requests and is reopening the public comment periods to allow comments to be submitted until March 9, 2022.

DATES: The comment periods for the RFIs published on January 24, 2022 (87 FR 3457; 87 FR 3461) is reopened. DOE will accept comments, data, and information regarding these RFIs received no later than March 9, 2022.

ADDRESSES: Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at *www.regulations.gov.* Follow the instructions for submitting comments. Alternatively, interested persons may submit comments, identified by docket number EERE–2022–BT–TP–0003 for the test procedure RFI and EERE–2022–BT–STD–0001 for the energy conservation standard RFI, by any of the following methods:

(1) *Federal eRulemaking Portal: www.regulations.gov.* Follow the instructions for submitting comments.

(2) *Email: DPPP2022TP0003@ee.doe.gov* for the test procedure RFI. *DPPP2022STD0001@ee.doe.gov* for the energy conservation standards RFI. For the test procedure RFI, include the docket number EERE–2022–BT–TP–0003 or regulatory information number (''RIN'') 1904–AE95 in the subject line of the message. For the energy conservation standards RFI, include the docket number EERE–2022–BT–STD–0001 or regulatory information number (''RIN'') 1904–AE97 in the subject line of the message.

No telefacsimiles (''faxes'') will be accepted.

Although DOE has routinely accepted public comment submissions through a variety of mechanisms, including postal mail and hand delivery/courier, the Department has found it necessary to make temporary modifications to the comment submission process in light of the ongoing COVID–19 pandemic. DOE is currently suspending receipt of public comments via postal mail and hand delivery/courier. If a commenter finds that this change poses an undue hardship, please contact Appliance Standards Program staff at (202) 586–1445 to discuss the need for alternative arrangements. Once the COVID–19 pandemic health emergency is resolved, DOE anticipates resuming all of its regular options for public comment submission, including postal mail and hand delivery/courier.

Docket: The dockets, which includes **Federal Register** notices, public meeting attendee lists and transcripts (if a public meeting is held), comments, and other supporting documents/materials, are available for review at *www.regulations.gov.* All documents in the dockets are listed in the *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 pages can be found at *www.regulations.gov/docket?D=EERE-2022-BT-TP-0003* and *www.regulations.gov/docket?D=EERE-2020-BT-STD-0001* for dedicated-purpose pool pump test procedure and energy conservation standards, respectively. The docket web pages contain instructions on how to access all documents, including public comments, in each docket.

FOR FURTHER INFORMATION CONTACT:

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