[6450-01-P]

DEPARTMENT OF ENERGY

[Case Number 2023-004; EERE-2023-BT-WAV-0016]

Energy Conservation Program: Notification of Petition for Waiver of United CoolAir Corporation from the Department of Energy Commercial Air Conditioners and Heat Pumps Test Procedure and Notification of Denial of Interim Waiver

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

ACTION: Notification of petition for waiver and denial of application for interim waiver; request for comments.

SUMMARY: This notification announces receipt of and publishes a petition for waiver and interim waiver from United CoolAir Corporation ("UCA"), which seeks a waiver for specified basic models of double-duct air conditioners and heat pumps from the U.S. Department of Energy ("DOE") test procedure used for determining the efficiency of double-duct air conditioners and heat pumps. This notification also announces that DOE is declining to grant the request for an interim waiver for the reasons described in this notification. DOE solicits comments, data, and information concerning UCA's petition and its suggested alternate test procedure so as to inform DOE's final decision on UCA's waiver request.

DATES: Written comments and information are requested and will be accepted on or before **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**.

ADDRESSES: Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at *www.regulations.gov* under docket number EERE–2023–BT–WAV-0016. Follow the instructions for submitting comments. Alternatively, interested persons may submit comments, identified by docket number EERE–2023–BT–WAV-0016, by any of the following methods:

(1) *Email: UnitedCoolAirACHP2023WAV0016@ee.doe.gov.* Include the case number [Case No. 2023-004] in the subject line of the message.

(2) *Postal Mail:* Appliance and Equipment Standards Program, U.S. Department of Energy, Building Technologies Office, Mailstop EE-5B, Petition for Waiver [Case No. 2023-004], 1000 Independence Avenue, SW., Washington, DC, 20585-0121. If possible, please submit all items on a compact disc ("CD"), in which case it is not necessary to include printed copies.

(3) *Hand Delivery/Courier:* Appliance and Equipment Standards Program, U.S. Department of Energy, Building Technologies Office, 950 L'Enfant Plaza, SW., 6th Floor, Washington, DC, 20024. Telephone: (202) 287-1445. If possible, please submit all items on a CD, in which case it is not necessary to include printed copies.

No telefacsimiles ("faxes") will be accepted. For detailed instructions on submitting comments and additional information on this process, see the "**SUPPLEMENTARY INFORMATION**" section of this document.

Docket: The docket for this activity, which includes *Federal Register* notices, 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, not all documents listed in the index may be publicly available, such as information that is exempt from public disclosure.

The docket webpage can be found at *www.regulations.gov/docket/EERE-2023-BT-WAV-0016*. The docket webpage contains instructions on how to access all documents, including public comments, in the docket. See the SUPPLEMENTARY INFORMATION section 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, Mailstop EE-5B, 1000 Independence Avenue,

SW., Washington, DC 20585-0121. Telephone: (240) 597-6737 E-mail: *AS_Waiver_Request@ee.doe.gov*.

Ms. Kathryn McIntosh, U.S. Department of Energy, Office of the General Counsel, Mail Stop GC-33, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585-0103. Telephone: (202) 586-2002. E-mail: *Kathryn.McIntosh@hq.doe.gov*.

SUPPLEMENTARY INFORMATION:

DOE is publishing UCA's petition for waiver in its entirety, pursuant to 10 CFR 431.401(b)(1)(iv). DOE invites all interested parties to submit in writing by [**INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER***], comments and information on all aspects of the petition, including the alternate test procedure. Pursuant to 10 CFR 431.401(d), any person submitting written comments to DOE must also send a copy of such comments to the petitioner. The contact information for the petitioner is: John Hodges, *jhodges@hwglaw.com*, Harris, Wiltshire & Grannis LLP, 1919 M Street NW Washington, DC 20036.

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. 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, hand delivery/courier, or postal mail. Comments and documents submitted via email, hand delivery/courier, or postal mail 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. If you submit via postal mail or hand delivery/courier, please provide all items on a CD, if feasible, in which case it is not necessary to submit printed copies. Faxes will not be accepted.

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

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

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

Case Number 2023-004

Denial of Interim Waiver

I. Authority and Background

The Energy Policy and Conservation Act, as amended ("EPCA"),[1] authorizes the U.S. Department of Energy ("DOE") to regulate the energy efficiency of several consumer products and certain industrial equipment. (42 U.S.C. 6291–6317) Title III, Part C of EPCA[2] established the Energy Conservation Program for Certain Industrial Equipment, which sets forth a variety of provisions designed to improve energy efficiency for certain types of industrial equipment. This equipment includes double-duct air conditioners and heat pumps, which are a subset of air-cooled commercial package air conditioning and heating equipment, the subject of this document. (42 U.S.C. 6311(1)(B)-(D))

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).

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

[1] All references to EPCA in this document refer to the statute as amended through the Energy Act of 2020, Pub. L. 116-260 (Dec. 27, 2020), which reflect the last statutory amendments that impact Parts A and A-1 of EPCA.
[2] For editorial reasons, upon codification in the U.S. Code, Part C was redesignated as Part A-1.

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.

Under 42 U.S.C. 6314, EPCA sets forth the criteria and procedures DOE is required to 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 the energy efficiency, energy use, or estimated annual operating cost of covered equipment (or class thereof) during a representative average use cycle and requires that test procedures not be unduly burdensome to conduct. (42 U.S.C. 6314(a)(2)) The test procedure for air-cooled commercial package air conditioning and heating equipment, including double-duct air conditioners and heat pumps, is contained in the Code of Federal Regulations ("CFR") at 10 CFR part 431, subpart F, appendix A, *Uniform Test Method for the Measurement of Energy Consumption of Air-Cooled Small (≥65,000 Btu/h), Large, and Very Large Commercial Package Air Conditioning and Heating Equipment* ("appendix A").

Under 10 CFR 431.401, any interested person may submit a petition for waiver from DOE's test procedure requirements. DOE will grant a waiver from the test procedure requirements if DOE determines either that the basic model(s) for which the waiver was requested contains a design characteristic that prevents testing of the basic model according to the prescribed test procedures, or that the prescribed test procedures evaluate the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data. 10 CFR 431.401(f)(2). A petitioner must include in its petition any alternate test procedures known to the petitioner to evaluate the performance of the equipment type in a manner representative of the energy consumption characteristics of the basic

model. 10 CFR 431.401(b)(1)(iii). DOE may grant the waiver subject to conditions, which may include adherence to alternate test procedures specified by DOE. 10 CFR 431.401(f)(2).

As soon as practicable after the granting of any waiver, DOE will publish in the *Federal Register* a notice of proposed rulemaking to amend its regulations so as to eliminate any need for the continuation of such waiver. 10 CFR 431.401(l). As soon thereafter as practicable, DOE will publish in the *Federal Register* a final rule to that effect. *Id*.

The waiver process also provides that DOE will grant an interim waiver from the test procedure requirements if it appears likely that the petition for waiver will be granted and/or if DOE determines that it would be desirable for public policy reasons to grant immediate relief pending a determination on the petition for waiver. 10 CFR 431.401(e)(3). Within one year of issuance of an interim waiver, DOE will either: (i) publish in the *Federal Register* a determination on the petition for waiver; or (ii) publish in the *Federal Register* a new or amended test procedure that addresses the issues presented in the waiver. 10 CFR 431.401(h)(1).

If the interim waiver test procedure methodology is different than the decision and order test procedure methodology, certification reports to DOE required under 10 CFR 429.12 and any representations must be based on either of the two methodologies until 180–360 days after the publication date of the decision and order, as specified by DOE in the decision and order. Thereafter, certification reports and any representations must be based on the decision and order test procedure methodology, unless otherwise specified by DOE. Once a manufacturer uses the decision and order test procedure methodology in a certification report or any representation, all subsequent certification reports and any representations must be made using the decision and order test procedure methodology while the waiver is valid. 10 CFR 431.401(i)(1). When DOE amends the test procedure to address the issues presented in a waiver, the waiver or interim

waiver will automatically terminate on the date on which use of that test procedure is required to demonstrate compliance. 10 CFR 431.401(h)(3).

II. UCA's Petition for Waiver and Interim Waiver

On November 19, 2018, DOE received from UCA a petition for waiver and interim waiver from the test procedure for commercial air conditioners and heat pumps set forth at 10 CFR part 431 subpart F.[3] (UCA, No. 1 at pp. 1-9)[4] The petition did not identify any of the information contained therein as confidential business information.

In its petition, UCA stated that the current DOE test procedure does not address the unique characteristics of UCA's double-duct technology. (UCA, No. 1 at p. 1) UCA noted that the basic models for which it is seeking a waiver use a double-duct configuration, which do not have an outdoor section and instead have ducting to an outside wall or window for the supply and discharge of outside air to and from the indoor condenser. (UCA, No. 1 at p. 3) UCA asserts in its waiver petition that the energy characteristics of these double-duct air conditioners[5] are

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[3] The specific models for which the petition applies include UCA C-Series commercial indoor horizontal double-duct air conditioner models C***T***, H***T***, E***T***, B***T***, and BC***T***, with nominally rated capacities of 72000, 96000, 120000, 144000 and 180000 Btu/h; C13-Series commercial indoor horizontal double-duct air conditioner models C***H***, H***H***, E***H***, B***H***, and BC***H***, with nominally rated capacities of 72000, 96000 and 120000 Btu/h; VertiCool Classic commercial indoor vertical double-duct air conditioner models VA***T***, VAR***T***, VARC***T***, BVA***T***, BCVA***T***, and EVA***T***, with nominally rated capacities of 72000, 96000, 120000, 144000, 180000, 240000 and 300000 Btu/h; and VertiCool Aurora commercial indoor vertical double-duct air conditioner models VA***H***, VAR***H***, VARC***H***, BVA***H***, BCVA***H***, and EVA***H***, with nominally rated capacities of 72000, 96000, 120000, 144000, 180000, 240000 and 300000 Btu/h. These models were provided by UCA in the Appendix included in its November 19, 2018 petition. The petition is included at the end of this notice.

[4] A notation in this form provides a reference for information that is in the docket for this test procedure waiver. This notation indicates that the statement preceding the reference is document number 1 in the docket and appears at page 2 of that document.

[5] As referenced in footnote 4 of the petition, quoting 10 CFR 431.92, double-duct air conditioner or heat pump means air-cooled commercial package air conditioning and heating equipment that— (1) Is either a horizontal single package or split-system unit; or a vertical unit that consists of two components that may be shipped or installed either connected or split; (2) Is intended for indoor installation with ducting of outdoor air from the building exterior to and from the unit, as evidenced by the unit and/or all of its components being non-weatherized, including the absence of any marking (or listing) indicating compliance with UL 1995, "Heating and Cooling Equipment," or any other equivalent requirements for outdoor use; (3) (i) If it is a horizontal unit, a complete unit has a maximum height of 35 inches; (ii) If it is a vertical unit, a complete unit has a maximum depth of 35 inches; and (4) Has a rated cooling capacity greater than or equal to 65,000 Btu/h and up to 300,000 Btu/h.

different from equipment with an outdoor section. (*Id*. at p. 3) UCA additionally states that the Federal test procedure does not account for this technology, and that the standard AHRI 340/360-2007,[6] incorporated by reference at the time of petition, was developed to test products with both outdoor and indoor sections (and UCA noted the references to "indoor section" and "outdoor section" throughout that standard). UCA asserted that because double-duct units do not have an outdoor section, they cannot be tested by the DOE test procedure and a waiver is necessary. (*Id.* at pp. 4-5) Further, UCA expressed that double-duct air conditioners have higher condenser fan motor horsepower to move condenser air against significant air pressure (0.5-1.5 in H_2O) and smaller but deeper condenser coils, which creates a higher pressure drop than that of an outdoor condensing section, resulting in more energy consumption of the condenser fan motor, and claimed that both of these characteristics were not accounted for in the test procedure. (*Id.*)

UCA also requested an interim waiver from the existing DOE test procedure, asserting that the petition for waiver is likely to be granted because the DOE test procedure does not address the unique characteristics of the requested basic models. (*Id.* at p. 7) UCA stated that without the granting of an interim waiver, UCA would suffer economic hardship and be at a competitive disadvantage if it must wait to rate these basic models pending a determination on petition for waiver. (*Id.*) UCA also claimed that the petition was supported by sound public policy because the products offered property owners and developers the ability to install new efficient central air conditioning in old buildings. (*Id.*)

[6] ANSI/AHRI Standard 340/360-2007, *2007 Standard for Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment*, approved by ANSI on October 27, 2011, and updated by addendum 1 in December 2010 and addendum 2 in June 2011 ("AHRI 340/360-2007"). Available online at: *webstore.ansi.org*.

III. Requested Alternate Test Procedure

EPCA requires that manufacturers use DOE test procedures when making representations about the energy consumption and energy consumption costs of covered equipment. (42 U.S.C. 6314(d)) Consistency is important when making representations about the energy efficiency of covered equipment, including when demonstrating compliance with applicable DOE energy conservation standards. Pursuant to 10 CFR 431.401, and after consideration of public comments on the petition, DOE may establish in a subsequent Decision and Order an alternate test procedure for the basic models addressed by the Interim Waiver Order.

UCA seeks to use an alternate test procedure to test and rate specific double-duct commercial unitary air conditioners ("CUAC") basic models. As an alternate test procedure, UCA proposed to test the specified basic models by ducting the condenser fan and imposing external static pressure ("ESP") per the manufacturer's instructions. Then, UCA proposed to adjust the input power of the condenser fan motor by subtracting "added" condenser motor horsepower imposed by the additional ESP, as presented below:

$$\varphi_{fa} = \frac{q \times \Delta p}{\eta}$$

where

φ_{fa} is the fan power adjustment, in watts;

η is 0.3×10^3 by convention;

Δp is the measured ESP difference, in pascals; and

q is the nominal airflow rate, in litres per second.

(UCA, No. 1 at pp. 6-7)

This formula is drawn from section 4.1.3.2 of ANSI/ARI/ASHRAE ISO Standard 13256-1:1998[7] and is used in that test standard to adjust for the motor horsepower expended in moving air through the indoor ducts. UCA proposed that this formula be used to adjust the condenser motor horsepower for double-duct units tested at non-zero condenser ESP to account only for the motor horsepower utilized in overcoming internal resistance of the unit. (*Id*.)

In the course of reviewing UCA's petition, DOE requested additional data from UCA to support their proposed alternate test procedure. UCA provided confidential data to DOE that included condenser fan power values at various ESPs and adjusted condenser fan power based on their suggested approach for several basic models offered.

IV. Denial of Interim Waiver

DOE has reviewed UCA's application for an interim waiver, the alternate test procedure requested by UCA, publicly available specification sheets and installation manuals relevant to these basic models, and additional confidential data from UCA regarding its petition. In submitting a petition for waiver, a petitioner must demonstrate that the subject basic model contains one or more design characteristics that prevent testing of the basic model according to the prescribed test procedures or cause the prescribed test procedures to evaluate the basic model in a manner so unrepresentative of its true energy and/or water consumption characteristics as to provide materially inaccurate comparative data. 10 CFR 431.401(a)(1); 10 CFR 431.401(f)(2). In determining whether to grant a request for an interim waiver, DOE considers whether: (1) it appears likely that the petition for waiver will be granted; and/or (2) it would be desirable for

[7] ANSI/ARI/ISO Standard 13256-1:1998, *Water-source heat pumps—Testing and rating for performance—Part 1: Water-to-air and brine-to-air heat pumps*, ISO approved 1998. Available online at *webstore.ansi.org/*.

public policy reasons to grant immediate relief pending a determination on the petition for waiver. 10 CFR 431.401(e)(=3).

As described, UCA claims in its petition for a waiver that the subject basic models contain a design characteristic (*i.e.*, no outdoor section) that prevents testing according to the DOE test procedure. In response to this claim, DOE notes that the current DOE test procedure for double-duct air conditioners and heat pumps is the same as that for single-duct commercial air conditioning and heating equipment at appendix A. In a direct final rule published on January 15, 2016 ("January 2016 Direct Final Rule"), DOE clarified that double-duct air conditioners are tested and rated under the same test conditions as single-duct air conditioners, without any ducting connected to, or an external static pressure applied on, the condenser side. 81 FR 2420, 2445.

The DOE test procedure at appendix A references certain sections of both AHRI 340/360-2007 and ANSI/ASHRAE 37-2009.[8] As mentioned by UCA, Table 3 of AHRI 340/360-2007 uses the term "outdoor section" in a header for columns providing test conditions. This term refers to the section of an air conditioning or heat pump system that rejects or absorbs heat (during mechanical cooling or heating mode, respectively), and does not apply only to units installed outdoors. For an air-cooled air conditioner, the test conditions under the heading "indoor section" are used for indoor air (*i.e.*, the evaporator airstream) and the test conditions under the heating "outdoor section" are used for outdoor air (*i.e.*, the condenser airstream), regardless of whether the components are intended for indoor or outdoor installation. DOE notes that condenser temperature conditions for testing water-cooled commercial unitary air conditioners ("WCUACs") are also specified under the "outdoor section" header, but similar to double-duct systems, both the indoor and outdoor sections of WCUACs are generally intended

[8] ANSI/ASHRAE Standard 37-2009, *Methods of Testing for Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment* ("ANSI/ASHRAE 37-2009"). Available at online at: *webstore.ansi.org*.

for indoor installation. Similarly, DOE notes that in rooftop air-cooled and evaporatively-cooled commercial unitary air conditioners, the "indoor section" (*i.e.*, the section conditioning indoor air) is located outdoors. Further, DOE notes that both ANSI/ASHRAE 37-2009 (which is referenced in the current DOE test procedure at appendix A) and ANSI/ASHRAE 37-2005[9] (which is referenced by AHRI 340/360-2007) use the term "outdoor side" to refer to the condensing section of an air-conditioning system. Specifically, both versions of ASHRAE Standard 37 define "outdoor side" as "that part of the system that rejects heat to or absorbs heat from a source external to the indoor airstream." This definition does not specify or require that the outdoor side is located outdoors. Therefore, DOE has tentatively determined that UCA has not demonstrated that the basic models subject to the petition contain a design characteristic that prevents testing of the basic model according to the prescribed test procedures because the test procedure applies to double-duct systems regardless of intended installation location.

DOE also evaluated UCA's petition to determine whether the prescribed test procedures evaluate the subject basic models in a manner so unrepresentative of their true energy consumption characteristics as to provide materially inaccurate comparative data. Relevant to this evaluation, DOE notes that the current energy conservation standards for double-duct air conditioners are defined in terms of the energy efficiency ratio ("EER") metric, which as defined by the test procedure at appendix A, represent the performance of an air conditioner when operating at zero condenser ESP. DOE further notes that the rating conditions associated with a metric are integral to the metric—performance measured at a different condenser ESP, for example, would not represent an EER value (as that metric is currently defined in appendix A) and would therefore not provide comparative data with which to compare to other equipment on the market subject to the same EER standard. As such, DOE evaluated UCA's suggested alternate test procedure to determine whether it would provide a more representative measure of

[9] ANSI/ASHRAE Standard 37-2005, *Methods of Testing for Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment* ("ANSI/ASHRAE 37-2005"). Available at online at: *webstore.ansi.org*.

EER (*i.e.*, a more representative measure of performance at zero condenser ESP) compared to the current Federal test procedure.[10] DOE reviewed UCA's proposed alternate test procedure, including the additional confidential data provided to DOE by UCA, within this framework.

UCA's suggested alternate test procedure specifies testing at a manufacturer-specified non-zero condenser ESP and then adjusting the measured condenser fan power down to reflect operation at zero condenser ESP. This adjustment of the measured condenser fan power requires an assumption regarding the efficiency value of the condenser fan. In its petition, UCA requested to use an assumed fan efficiency value of 0.3. Based on its review, DOE has tentatively concluded that the fan efficiency value of 0.3 suggested by UCA is unrepresentatively low. In particular, confidential data provided by UCA suggests that for some of the models subject to UCA's petition for waiver, assuming a fan efficiency value of 0.3 would result in the fan power adjustment exceeding the actual fan power consumed at zero condenser ESP, thus resulting in negative condenser fan power being reflected in the metric.

As a result, the test procedure suggested by UCA would under-represent the condenser fan power that would be expected at zero condenser ESP because it subtracts an unrepresentatively high adjustment factor from the measured value of condenser fan power. This would result in EER ratings of performance at zero condenser ESP that are unrepresentatively high and therefore not comparable to EER ratings developed by other manufacturers of double-duct systems based on testing at zero condenser ESP (*i.e.*, ratings developed without any adjustment to measured condenser fan power). Therefore, DOE has tentatively concluded that

[10] DOE notes that it recently published a notice of proposed rulemaking ("NOPR") regarding the test procedures for commercial unitary air conditioners and heat pumps, including double-duct air conditioners and heat pumps. 88 FR 56392 (August 17, 2023). This NOPR proposes a new test procedure that specifies the new metrics integrated ventilation, economizer, and cooling ("IVEC") and integrated ventilation and heating efficiency ("IVHE"). These proposed new metrics would change the condenser ESP requirement from zero to 0.5 in. H_2O for double-duct air conditioners and heat pumps. Were DOE to adopt the test procedures for IVEC and IVHE for double-duct systems as proposed, testing to those metrics would not be required until DOE adopts energy conservation standards for double-duct systems in terms of those metrics.

the alternate test procedure suggested in UCA's petition for waiver would not evaluate the performance of the subject models in a manner more representative of the energy consumption characteristics of each basic model, within the context of representing EER performance at zero condenser ESP.

Additionally, DOE notes that multiple other manufacturers of double-duct systems list condenser fan motor performance at ESPs as low as zero in their product literature, demonstrating that there is nothing inherent to double-duct systems that prevents representing EER performance at zero condenser ESP in accordance with the current Federal test procedure.[11] Therefore, DOE has tentatively concluded that UCA has not demonstrated that the basic models subject to the petition contain a design characteristic that prevents testing of those models according to the prescribed test procedure or that the prescribed test procedure evaluates the basic model in a manner so unrepresentative of its true energy consumption characteristics as to provide materially inaccurate comparative data with other double-duct systems. Absent such data, DOE is unable to conclude that UCA's petition for waiver will likely be granted.

Further, DOE does not find that public policy reasons weigh in favor of granting immediate relief pending a determination on the petition for waiver. As previously indicated, multiple other manufacturers certify to DOE EER ratings for double-duct systems that are compliant with the currently applicable EER standards and are based on the current Federal test procedure, which reflects performance at zero condenser ESP. These models demonstrate that commercial consumers currently have multiple options for installing double-duct systems; therefore, DOE does not find granting immediate relief to UCA is necessary. For these reasons, DOE is denying UCA's petition for interim waiver and requesting comment.

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[11] Condenser fan motor performance at condenser ESPs as low as zero is listed in the product datasheets for the Carrier Omnizone and Skypeak D-series double-duct model lines. These examples can be found on the docket at *regulations.gov/EERE-2023-BT-WAV-0016.*

DOE makes decisions on waivers and interim waivers for only those basic models specifically set out in the petition, not future models that may be manufactured by the petitioner. UCA may submit a new or amended petition for waiver and request for grant of interim waiver, as appropriate, for additional basic models of double-duct air conditioners and heat pumps.

While DOE declines to approve the use of UCA's suggested alternate test procedure in an interim waiver at this time, DOE may consider including an alternate procedure in a subsequent Decision and Order. DOE solicits comments from interested parties on all aspects of the petition, including any alternate test procedure.

V. Signing Authority

This document of the Department of Energy was signed on November 17, 2023, by Jeffrey Marootian, 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 November 17, 2023.

Treena V. Garrett,

Federal Register Liaison Officer,

U.S. Department of Energy.

BEFORE THE
UNITED STATES DEPARTMENT OF
ENERGY WASHINGTON, D.C. 20585

IN THE MATTER OF:

ENERGY EFFICIENCY PROGRAM: TEST

PROCEDURE FOR COMMERCIAL AIR

CONDITIONERS AND HEAT PUMPS

PETITION OF UNITED COOLAIR CORPORATION FOR WAIVER AND APPLICATION FOR INTERIM WAIVER OF TEST PROCEDURE FOR COMMERCIAL AIR CONDITIONERS AND HEAT PUMPS

United CoolAir Corporation (UCA) respectfully submits this Petition for Waiver and Application for Interim Waiver[12] from DOE's test procedure for commercial air conditioners and heat pumps. UCA seeks a waiver because the current DOE test procedure[13] does not address the unique characteristics of UCA's double-duct technology. Therefore, UCA's double-duct models cannot be tested under the DOE test procedure. UCA also requests expedited treatment of the Petition and Application.

I. UCA

Since 1988, UCA has been a small, family-owned and operated American company. It is a specialty manufacturer of double-duct commercial air conditioners and other air conditioning products. It is located at 491 E. Princess Street, York, PA 17403 (tel. 717-843-4311; *https://unitedcoolair.com*). UCA's start came with the creation of air conditioning units built to meet extremely high standards for the U.S. Military. Since then, UCA has evolved into a full service provider of unique and often complex HVAC systems.

[12] *See* 10 C.F.R. § 431.401 (Petitions for waiver and interim waiver).
[13] *Id*. § 431.96.

II. Double-Duct Commercial Air Conditioners

UCA specializes in double-duct commercial air conditioners. They are used to provide efficient central air conditioning in older buildings that are being renovated or updated and where there is only limited space available. These systems fit entirely inside a building and thus are dramatically different from the bulky products that have outdoor as well as indoor components. Their modular sections can be taken through standard doors or smaller openings, around corners, down hallways, and placed into service elevators. Indoor installation (above the ceiling and crawl spaces) minimizes expensive handling, rigging, or permits, and avoids the need for building modifications. It also eliminates expensive repairs and replacements due to weather damage, theft, and vandalism. All of these products are built-to-order and adapted to the different requirements of unique buildings, while providing the latest in control and design technologies.

III. Basic Models for Which a Waiver is Requested

The basic models for which a waiver is requested are set forth in the Appendix. They are double-duct commercial air conditioners distributed in commerce under the UCA brand name. The models are within the following series: C-Series; C13-Series; VertiCool Classic; and VertiCool Aurora.[14] The C-Series and C13-Series are indoor horizontal air conditioners. The VertiCool Classic and VertiCool Aurora series have vertical cabinets that fit neatly along walls, in closet spaces, or in mechanical rooms.

IV. Need for the Requested Waiver

[14] To the best of UCA's knowledge, AboveAir Technologies, Skymark, Task Applied Products, Skil-aire, and Compu-Aire are the only manufacturers of other commercial air conditioning basic models distributed in commerce in the United States to incorporate design characteristic(s) similar to those found in the models that are the subject of this petition. To the best of UCA's knowledge, AirPac, Carrier, and Addison used to produce similar products but no longer do.

The UCA double-duct models are specialized, niche products intended for indoor installation – almost entirely in old buildings. They are ideal for replacement or renovation applications, where space constraints prohibit roof-top or other types of products. They do not have an outdoor section, and their energy characteristics are different from products that have one. They have ducting to an outside wall or window for the supply and discharge of outside air to and from the indoor condenser.[15] DOE's test procedure does not account for this technology and is therefore inapplicable for these products.

DOE has recognized the useful, unique nature of double-duct products such as UCA's.

> DOE agrees that these [double-duct] units have features that justify establishing separate equipment classes for them. Double-duct units, as evidenced by several commenters, offer a unique utility that may otherwise become unavailable if these units were subjected to the more rigorous standards required by this direct final rule for other CUAC and CUHP equipment. DOE notes that double-duct units, which are installed within the building envelope and use ductwork to transfer outdoor air to and from the outdoor unit, would have added challenges in meeting more stringent energy conservation standards due to space constraints and added condenser fan power.[16]

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[15] *Double-duct air conditioner or heat pump means air-cooled commercial package air conditioning and heating equipment* that—

(1) Is either a horizontal single package or split-system unit; or a vertical unit that consists of two components that may be shipped or installed either connected or split;

(2) Is intended for indoor installation with ducting of outdoor air from the building exterior to and from the unit, as evidenced by the unit and/or all of its components being non-weatherized, including the absence of any marking (or listing) indicating compliance with UL 1995, "Heating and Cooling Equipment," or any other equivalent requirements for outdoor use;

(3)(i) If it is a horizontal unit, a complete unit has a maximum height of 35 inches; (ii) If it is a vertical unit, a complete unit has a maximum depth of 35 inches; and

(4) Has a rated cooling capacity greater than or equal to 65,000 Btu/h and up to 300,000 Btu/h.

10 C.F.R. § 431.92.

[16] *Energy Conservation Program for Certain Industrial Equipment: Energy Conservation Standards for Small, Large, and Very Large Air-Cooled Commercial Package Air Condition and Heating Equipment and Commercial Warm-Air Furnaces*, 81 Fed. Reg. 2420, 2446 (Jan. 15, 2016).

Even though DOE has agreed that double-duct products are unique and useful, its test procedure has not yet been amended to address and take into account their unique characteristics. Rather, the test procedure is silent on these products.

Instead, DOE's test procedure[17] incorporates AHRI Standard 340/360-2007,[18] which was developed to test units that have *both outdoor and indoor sections*. Specifically, AHRI 340/360-2007 requires: "Standard Ratings shall be established at the Standard Rating Conditions specified in Table 3."[19] Table 3, "Conditions for Standard Rating and Operating Tests," mandates conditions for an "Indoor Section" and "Outdoor Section."[20] "Table 3 indicates the tests and test conditions which are required to determine values of standard capacity and ratings and values of energy efficiency."[21] Therefore, double-duct units, which do not have an outdoor section, simply cannot be tested by the DOE test procedure. Moreover, even though DOE acknowledges "added condenser fan power" as a distinguishing characteristic of double-duct products,[22] the DOE test procedure does not account for the higher condenser motor horsepower of these products. Nor does it account for the smaller but deeper coil required for the double-duct systems to move air through the duct and discharge it to the outside.

An outdoor condenser/condensing unit utilizes a propeller fan (light duty) to move large volumes of air against low air pressure (0" External Static Pressure - ESP) and utilizes a relatively small motor. In addition, since space (footprint/volume/height) and air path (perimeter inlet and top discharge) through the outdoor coil of such models are not an issue, outdoor condensing

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[17] 10 C.F.R. § 431.96.
[18] ANSI/AHRI Standard 340/360-2007 (formerly ARI Standard 340/360-2007), 2007 Standard for Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment.
[19] AHRI 340/360-2007 § 6.1.
[20] *Id.* § 6.1, Table 3.
[21] *Id.* § 6.1.3.
[22] *Energy Conservation Program for Certain Industrial Equipment: Energy Conservation Standards for Small, Large, and Very Large Air-Cooled Commercial Package Air Condition and Heating Equipment and Commercial Warm-Air Furnaces*, 81 Fed. Reg. at 2446.

sections typically utilize 1 or 2 row deep 'U/L' shaped condenser coils to maximize heat transfer and minimize air pressure drop.

In contrast, a double-duct unit's condenser fan (heavy duty – typically centrifugal and belt driven) has to be designed to move condenser air against significant air pressure (0.5-1.5" ESP), and it utilizes a relatively larger motor. Double-duct models also have smaller and deeper condenser coils than models with outdoor condensing sections, since cabinet space is much smaller than an outdoor condensing section. An indoor condenser coil is typically 3-4 rows deep, with higher pressure drop than an outdoor condensing section. Such higher pressure drop consumes more energy than that associated with an outdoor condensing section.

Since the DOE test procedure does not address and account for double-duct technology, a waiver is necessary. DOE's rules provide that DOE "will grant a waiver from the test procedure requirements" in such circumstances.[23] Accordingly, UCA urges that a waiver be granted for the basic models in the Appendix that will allow use of the alternate test procedure discussed below. Unlike the current test procedure, the alternate test procedure is designed to properly take into account UCA double-duct technology. The waiver should continue until DOE adopts an applicable amended test procedure.

V. Proposed Alternate Test Procedure

UCA proposes the following alternate test procedure to evaluate the performance of the basic models listed in the Appendix. It is the same as the existing DOE test procedure for commercial air conditioners, except that it takes double-duct technology into account. It does so by utilizing a formula drawn from Section 4.1.3.2 of ANSI/ARI/ASHRAE ISO Standard 13256-

[23] 10 C.F.R. § 431.401(f)(2).

1:1998[24] to adjust for the motor horsepower expended in moving air through the indoor ducts. It bears noting that AHRI 340/360-2007 provides that ISO 13256-1:1998 is among those publications "essential to the formation and implementation of the standard [340/360]. All references in this appendix [to 340/360] are considered as part of the standard."[25]

The formula in Section 4.1.3.2 of ISO 13256-1 normalizes the double-duct condenser motor horsepower by adjusting the condenser motor horsepower to account *only* for the motor horsepower utilized in overcoming *internal* resistance of the unit.

The waiver should provide that UCA shall be required to test the performance of the basic models listed in the Appendix hereto according to the test procedure for commercial air conditioners and heat pumps in 10 C.F.R. Part 431, Subpart F (including AHRI 340/360-2007), except as follows:

1. Duct the condenser fan, and impose ESP, each as per manufacturer's instructions.

2. Adjust kW input by subtracting "added" condenser motor horsepower utilizing the following formula. (No changes to unit cooling capacity or heating capacity is required.)

$$\varphi_{fa} = \frac{q \times \Delta p}{\eta}$$

Where

φ_{fa} is the fan power adjustment, in watts;

η is 0.3×10^3 by convention;

Δp is the measured ESP difference, in pascals; and

q is the nominal airflow rate, in litres per second.

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[24] ANSI/ARI/ASHRAE ISO Standard 13256-1:1998.
[25] AHRI 340/360-2007, App. A §§ A1, A1.7.

VI. Application for Interim Waiver

UCA also hereby applies for an interim waiver of the applicable test procedure requirements for the UCA basic models set forth in the Appendix. UCA meets the criteria for an interim waiver. UCA's Petition for Waiver is likely to be granted, because the current DOE test procedure[26] clearly does not address the unique characteristics of these UCA basic models. Without waiver relief, UCA would be subject to requirements that are inappropriate for these products. Additionally, UCA will suffer economic hardship and be at a competitive disadvantage if it must wait to rate these basic models pending a determination on the petition for waiver. DOE approval of UCA's interim waiver application is also supported by sound public policy. As noted above, these products offer property owners and developers the ability to install new efficient central air conditioning in old buildings.

VII. Conclusion

UCA respectfully requests that DOE grant its Petition for Waiver of the applicable test procedure for specified basic models, and also grant its Application for Interim Waiver. UCA also requests expedited treatment of the Petition and Application.

Respectfully submitted,

/s/

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[26] 10 C.F.R. Part 431, Subpart F.

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Appendix

The waiver and interim waiver requested herein should apply to testing and rating of the following basic models that are manufactured by UCA:

C-Series commercial indoor horizontal double-duct air conditioner models C…T…, H…T…, E…T…, B…T…, and BC…T…, with nominally rated capacities of 72000, 96000, 120000, 144000 and 180000 Btu/h.

C13-Series commercial indoor horizontal double-duct air conditioner models C…H…, H…H…, E…H…, B…H…, and BC…H…, with nominally rated capacities of 72000, 96000 and 120000 Btu/h.

VertiCool Classic commercial indoor vertical double-duct air conditioner models VA…T…, VAR…T…, VARC…T…, BVA…T…, BCVA…T…, and EVA…T…, with nominally rated capacities of 72000, 96000, 120000, 144000, 180000, 240000 and 300000 Btu/h.

VertiCool Aurora commercial indoor vertical double-duct air conditioner models VA…H…, VAR…H…, VARC…H…, BVA…H…, BCVA…H…, and EVA…H…, with nominally rated capacities of 72000, 96000, 120000, 144000, 180000, 240000 and 300000 Btu/h.

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