



[6450-01-P]

DEPARTMENT OF ENERGY

[Case Number 2020-004; EERE-2020-BT-WAV-0021]

Energy Conservation Program: Notice of Petition for Waiver of GE Appliances, a Haier Company from the Department of Energy Room Air Conditioner Test Procedure and Notice of Grant of Interim Waiver

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

ACTION: Notice of petition for waiver and grant of an interim waiver; request for comments.

SUMMARY: This notice announces receipt of and publishes a petition for waiver and interim waiver from GE Appliances, a Haier Company, which seeks a waiver for specified room air conditioner basic models from the U.S. Department of Energy (“DOE”) test procedure used for determining the efficiency of room air conditioners. DOE also gives notice of an Interim Waiver Order that requires GEA to test and rate the specified room air conditioner basic models in accordance with the alternate test procedure set forth in the Interim Waiver Order. DOE solicits comments, data, and information concerning GEA’s petition and suggested alternate test procedure so as to inform DOE’s final decision on GEA’s waiver request.

DATES: The Interim Waiver Order is effective on [INSERT DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]. Written comments and information 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 <http://www.regulations.gov>. Alternatively, interested persons may submit comments, identified by case number “2020-004”, and Docket number “EERE-2020-BT-WAV-0021,” by any of the following methods:

- *Federal eRulemaking Portal:* <http://www.regulations.gov>. Follow the instructions for submitting comments.

- *E-mail:* GERAC2020WAV0021@ee.doe.gov. Include Case No. 2020-004 in the subject line of the message.
- *Postal Mail:* Appliance and Equipment Standards Program, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office, Mailstop EE-5B, Petition for Waiver Case No. 2020-004, 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.
- *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 telefacsimilies (“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, which includes *Federal Register* notices, comments, and other supporting documents/materials, is available for review at <http://www.regulations.gov>. All documents in the docket are listed in the <http://www.regulations.gov> index. However, some documents listed in the index, such as those containing information that is exempt from public disclosure, may not be publicly available.

The docket web page can be found at <https://www.regulations.gov/docket?D=EERE-2020-BT-WAV-0021>. The docket web page contains instruction 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 <http://www.regulations.gov>.

FOR FURTHER INFORMATION CONTACT: Ms. Lucy deButts, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office, Mailstop EE-5B, 1000 Independence Avenue, SW., Washington, DC 20585-0121. E-mail: AS_Waiver_Request@ee.doe.gov. Ms. Amelia Whiting, 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) 586-2588. E-mail: Amelia.Whiting@hq.doe.gov.

SUPPLEMENTARY INFORMATION: DOE is publishing GE Appliances, a Haier Company's ¹ ("GEA") petition for waiver in its entirety, pursuant to 10 CFR 430.27(b)(1)(iv), absent any information for which GEA requested treatment as confidential business information. 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 430.27(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 T. Schlafer, john.schlafer@geappliances.com, Appliance Park – AP2-225, Louisville, KY 40225.

Submitting comments via <http://www.regulations.gov>. The <http://www.regulations.gov> web page will require you to provide your name and contact information. Your complete 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

¹ The petition was filed under the company name GE Appliances, a Haier Company. DOE notes that the official company name is Haier US Appliance Solutions. For the purpose of this notice and the interim order, DOE uses the name as provided in the petition and treats the two names as synonymous.

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

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

Submitting comments via email, hand delivery/courier, or postal mail. Comments and documents submitted via email, hand delivery/courier, or postal mail also will be posted to <http://www.regulations.gov>. If you do not want your personal contact information to be publicly viewable, do not include it in your comment or any accompanying documents. Instead, provide your contact information on a cover letter. Include your first and last names, email address, telephone number, and optional mailing address. The cover letter will not be publicly viewable as long as it does not include any comments.

Include contact information 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, postal mail, or hand delivery/courier two well-marked copies: one copy of the document marked confidential including all the information believed to be confidential, and one copy of the document marked “non-confidential” with the information believed to be confidential deleted. Submit these documents via email or on a CD, if feasible. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

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).

Signing Authority

This document of the Department of Energy was signed on September 18, 2020, by Alexander N. Fitzsimmons, Deputy Assistant Secretary for Energy Efficiency, 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 September 18, 2020.

Treena V. Garrett,
Federal Register Liaison Officer,
U.S. Department of Energy.

Case Number 2020-004

Interim Waiver Order

I. Background and Authority

The Energy Policy and Conservation Act, as amended (“EPCA”),² authorizes the U.S. Department of Energy (“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 B³ of EPCA. Public Law 94-163 (42 U.S.C. 6291–6309, as codified), established the Energy Conservation Program for Consumer Products Other Than Automobiles, which sets forth a variety of provisions designed to improve energy efficiency for certain types of consumer products. These products include room air conditioners, the subject of this Interim Waiver Order. (42 U.S.C. 6292(a)(2))

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. 6291), test procedures (42 U.S.C. 6293), labeling provisions (42 U.S.C. 6294), energy conservation standards (42 U.S.C. 6295), and the authority to require information and reports from manufacturers (42 U.S.C. 6296).

The Federal testing requirements consist of test procedures that manufacturers of covered products must use as the basis for: (1) certifying to DOE that their products comply with the applicable energy conservation standards adopted pursuant to EPCA (42 U.S.C. 6295(s)), and (2)

² All references to EPCA in this document refer to the statute as amended through America’s Water Infrastructure Act of 2018, Public Law 115-270 (Oct. 23, 2018).

³ For editorial reasons, upon codification in the U.S. Code, Part B was redesignated as Part A.

making representations about the efficiency of that product (42 U.S.C. 6293(c)). Similarly, DOE must use these test procedures to determine whether the product complies with relevant standards promulgated under EPCA. (42 U.S.C. 6295(s))

Under 42 U.S.C. 6293, EPCA sets forth the criteria and procedures DOE is required to follow when prescribing or amending test procedures for covered products. EPCA requires that any test procedures prescribed or amended under this section must be reasonably designed to produce test results which reflect the energy efficiency, energy use or estimated annual operating cost of a covered product during a representative average use cycle or period of use and that test procedures not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3)) The test procedure for room air conditioners is contained in the Code of Federal Regulations (“CFR”) at 10 CFR part 430 subpart B appendix F, “Uniform Test Method for Measuring the Energy Consumption of Room Air Conditioners” (“appendix F”).

Under 10 CFR 430.27, 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 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 430.27(f)(2). A petitioner must include in its petition any alternate test procedures known to the petitioner to evaluate the performance of the product type in a manner representative of the energy consumption characteristics of the basic model. 10 CFR 430.27(b)(1)(iii). DOE may grant the waiver subject to conditions, including adherence to alternate test procedures. 10 CFR 430.27(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 430.27(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 may grant an interim waiver if it appears likely that the underlying 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 underlying petition for waiver. 10 CFR 430.27(e)(2). 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 430.27(h)(1).

When DOE amends the test procedure to address the issues presented in a waiver, the waiver will automatically terminate on the date on which use of that test procedure is required to demonstrate compliance. 10 CFR 430.27(h)(2).

II. GEA's Petition for Waiver and Interim Waiver

On June 2, 2020, GEA filed a petition for waiver and interim waiver from the test procedure for room air conditioners set forth at appendix F. (GEA, No. 1 at pp. 1–4)⁴ Appendix F requires testing in the full-load condition and according to GEA does not take into account the energy savings achieved by variable-speed compressors under part-load conditions.⁵ Appendix F

⁴ A notation in this form provides a reference for information that is in the docket for this test procedure waiver (Docket No. EERE-2020-BT-WAV-0021) (available at <https://www.regulations.gov/docket?D=EERE-2020-BT-WAV-0021>). This notation indicates that the statement preceding the reference is document number 1 in the docket and appears at pages 1-4 of that document.

⁵ The specific basic models for which the petition applies are basic models AHNR08AC, AHNR10AC, AHNR12AC, AHTR08AC, AHTR10AC, AHTR12AC, AKNR08AC, AKNR10AC, AKNR12AC, AHNR14AC,

requires testing room air conditioners only with full-load performance, in part, as a result of DOE having previously concluded that developing a part-load metric for this product was not likely to stimulate widespread use of part-load technology. 76 FR 972, 1016 (Jan. 6, 2011).

GEA states the basic models listed in its petition adjust their compressor speed based on detected conditions, which results in more efficient operation under part-load conditions. GEA claims that these speed adjustments allow the compressor to run for longer periods without cycling on and off, improving efficiency in a way that is not currently captured by the DOE test procedure.

GEA also requests an interim waiver from the existing DOE test procedure. DOE will grant an interim waiver 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 of the petition for waiver. 10 CFR 430.27(e)(2).

DOE understands that, absent an interim waiver, the test procedure does not accurately measure the energy consumption of variable-speed room air conditioners, and without a test procedure waiver, the part-load characteristics of the basic models identified in GEA's petition would not be captured.

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 products. (42 U.S.C.

6293(c)) Consistency is important when making representations about the energy efficiency of products, including when demonstrating compliance with applicable DOE energy conservation standards. Pursuant to its regulations at 10 CFR 430.27, 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.

GEA seeks to use an alternate test procedure to test and rate specific room air conditioner basic models that is the same as the alternate test procedure prescribed in a Decision and Order granted to LG Electronics U.S.A., Inc., published on May 8, 2019 (84 FR 20111; “LG Waiver”) and a Decision and Order granted to GD Midea Air Conditioning Equipment Co., Ltd, published on May 26, 2020 (85 FR 31481; “Midea Waiver”).⁶ The LG Waiver and Midea Waiver each require testing certain basic models of variable-speed room air conditioners according to the test procedure in appendix F in a modified fashion. Instead of testing at only one rating condition, these Waivers require testing at four rating conditions. 84 FR 20111, 20119; 85 FR 31481; 31486. The four test conditions GEA requests are identical to those in the LG Waiver and the Midea Waiver and are presented in Table III.1.

Table III.1: Indoor and Outdoor Inlet Air Test Conditions -- Variable-Speed Room Air Conditioners

Test Condition	Evaporator Inlet (Indoor) Air, °F		Condenser Inlet (Outdoor) Air, °F		Compressor Speed
	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	
Test Condition 1	80	67	95	75	Full
Test Condition 2	80	67	92	72.5	Full

⁶ The alternate test procedures prescribed in the LG Waiver and Midea Waiver are substantively the same. In the Midea Waiver, DOE provided some additional clarifications and instruction regarding definitions, maintenance of compressor speed, the annual energy consumption and corresponding cost calculations, and adjustments to the CEER calculation for clarity. 85 FR 31481, 31483.

Test Condition 3	80	67	87	69	Intermediate
Test Condition 4	80	67	82	65	Low

GEA requests the same test procedure as granted in the LG and Midea Waivers. That test procedure yields four individual CEER ratings, one at each test condition. A test unit’s weighted-average combined energy efficiency ratio (“CEER”) metric is calculated from the individual CEER values obtained at the four rating conditions. DOE based the room air conditioner weighting factors for each rating temperature on the fractional temperature bin hours provided in Table 19 of DOE’s test procedure for central air conditioners (10 CFR part 430, subpart B, appendix M (“appendix M”). This weighted-average value is adjusted to normalize it against the expected weighted-average CEER under the same four rating conditions of a theoretical comparable single-speed room air conditioner. This theoretical air conditioner is one that at the 95-degree Fahrenheit (“°F”) test condition performs the same as the variable-speed test unit, but with differing performance at the other rating conditions. The differing performance is due to optimization of the refrigeration system efficiency through compressor speed adjustments to eliminate cycling losses and better match the cooling load. Determining the test unit’s final rated CEER value under the procedure GEA requested involves multiplying a performance adjustment factor with the measured performance of the variable-speed room air conditioner when tested at the 95 °F rating condition according to appendix F. The performance adjustment factor, derived from testing at the multiple rating conditions, reflects the average performance improvement due to the variable-speed compressor across multiple rating conditions. GEA states that this approach takes into account performance and efficiency improvements associated with variable-speed room air conditioners.

IV. Interim Waiver Order

DOE has reviewed GEA’s application for an interim waiver, the alternate test procedure requested by GEA, and performance data for the models listed by GEA in its petition. Based on this review, the alternate test procedure requested by GEA, along with the additional clarification and detail provided in the Midea Waiver and one additional clarification that the electrical power input in 10 CFR 430.23(f)(3)(i) is in units of watts, appears to allow for the accurate measurement of the energy efficiency of the listed basic models of room air conditioners, while alleviating the testing problems associated with GEA’s implementation of room air conditioner testing for these basic models. Consequently, DOE has determined that it likely will grant GEA’s petition for waiver. Furthermore, DOE has determined that it is desirable for public policy reasons to grant GEA immediate relief pending a determination of the petition for waiver.

For the reasons stated, it is **ORDERED** that:

(1) GEA must test and rate the following room air conditioner basic models with the alternate test procedure set forth in paragraph (2).

Brand	Basic Model
GE	AHNR08AC
GE	AHNR10AC
GE	AHNR12AC
GE	AHTR08AC
GE	AHTR10AC
GE	AHTR12AC
GE	AKNR08AC
GE	AKNR10AC
GE	AKNR12AC
GE	AHNR14AC
GE	AHNR18AC
GE	AHTR14AC
GE	AHTR18AC
GE	AKNR14AC
GE	AKNR18AC
GE	AHNR24AC

GE	AHTR24AC
GE	AKNR24AC

(2) The alternate test procedure for the GEA basic models listed in paragraph (1) of this Interim Waiver Order is the test procedure for room air conditioners prescribed by DOE at 10 CFR part 430, subpart B, appendix F and 10 CFR 430.23(f), with the following two exceptions: (i) Determine the CEER as detailed below, and (ii) Calculate the average annual energy consumption referenced in 10 CFR 430.23(f)(3) as detailed below. In addition, for each basic model listed in paragraph (1), at each test condition maintain compressor speeds and control settings for the variable components according to the instructions GEA submitted to DOE (<https://www.regulations.gov/docket?D=EERE-2020-BT-WAV-0021-0001>). All other requirements of appendix F and DOE's regulations remain applicable.

In 10 CFR 430.23, in paragraph (f) revise paragraph (3)(i) to read as follows:

The electrical power input in watts as calculated in section 5.2.1 of appendix F to this subpart divided by 1,000 to convert the power to kilowatts, and

In 10 CFR 430.23, in paragraph (f) revise paragraph (5) to read as follows:

(5) Calculate the combined energy efficiency ratio for room air conditioners, expressed in Btu's per watt-hour, as follows:

(i) Calculate the quotient of:

(A) The cooling capacity as determined at the 95 °F outdoor test condition, Capacity₁, in Btus per hour, as measured in accordance with section 5.1 of appendix F to this subpart multiplied by the representative average-use cycle of 750 hours of compressor operation per year, divided by

(B) The combined annual energy consumption, in watt-hours, which is the sum of the annual energy consumption for cooling mode, calculated in section 5.4.2 of appendix F to this subpart for test condition 1 in Table 1 of appendix F to this subpart, and the standby mode and off mode energy consumption, as measured in accordance with section 5.3 of appendix F to this subpart. Multiply the sum of the annual energy consumption in cooling mode and standby mode and off mode energy consumption by a conversion factor of 1,000 to convert kilowatt-hours to watt-hours.

(ii) Multiply the quotient calculated in paragraph (f)(5)(i) of this section by $(1 + F_p)$, where F_p is the variable-speed room air conditioner unit's performance adjustment factor as calculated in section 5.4.8 of appendix F to this subpart.

(iii) Round the resulting value from paragraph (f)(5)(ii) of this section to the nearest 0.1 Btu per watt-hour.

In 10 CFR part 430, subpart B, appendix F:

Add in Section 1, *Definitions*:

1.8 "Single-speed" means a type of room air conditioner that cannot automatically adjust the compressor speed based on detected conditions.

1.9 "Variable-speed" means a type of room air conditioner that can automatically adjust the compressor speed based on detected conditions.

1.10 "Full compressor speed (full)" means the compressor speed specified by GE Appliances, a Haier Company (<https://www.regulations.gov/docket?D=EERE-2020-BT-WAV-0021-0001>) at which the unit operates at full load testing conditions.

1.11 "Intermediate compressor speed (intermediate)" means the compressor speed higher than the low compressor speed by one third of the difference between low compressor speed and full compressor speed with a tolerance of plus 5 percent (designs with non-discrete compressor

speed stages) or the next highest inverter frequency step (designs with discrete compressor speed steps).

1.12 “Low compressor speed (low)” means the compressor speed specified by GE Appliances, a Haier Company (<https://www.regulations.gov/docket?D=EERE-2020-BT-WAV-0021-0001>) at which the unit operates at low load test conditions, such that Capacity₄, the measured cooling capacity at test condition 4 in Table 1 of this appendix, is no less than 47 percent and no greater than 57 percent of Capacity₁, the measured cooling capacity with the full compressor speed at test condition 1 in Table 1 of this appendix.

1.13 “Theoretical comparable single-speed room air conditioner” means a theoretical single-speed room air conditioner with the same cooling capacity and electrical power input as the variable-speed room air conditioner unit under test, with no cycling losses considered, at test condition 1 in Table 1 of this appendix.

Add to the end of Section 2.1 *Cooling*:

For the purposes of this waiver, test each unit following the cooling mode test a total of four times: one test at each of the test conditions listed in Table 1 of this appendix, consistent with section 3.1 of this appendix.

Revise Section 3.1, *Cooling mode*, to read as follows:

Cooling mode. Establish the test conditions described in sections 4 and 5 of ANSI/AHAM RAC-1 (incorporated by reference; see 10 CFR 430.3) and in accordance with ANSI/ASHRAE 16 (incorporated by reference; see 10 CFR 430.3), with the following exceptions: Conduct the set of four cooling mode tests with the test conditions in Table 1 of this appendix. Set the compressor speed required for each test condition in accordance with instructions GE Appliances, a Haier Company provided to DOE (<https://www.regulations.gov/docket?D=EERE-2020-BT-WAV-0021-0001>).

Table 1: Indoor and Outdoor Inlet Air Test Conditions – Variable-Speed Room Air Conditioners

Test Condition	Evaporator Inlet (Indoor) Air, °F		Condenser Inlet (Outdoor) Air, °F		Compressor Speed
	Dry Bulb	Wet Bulb	Dry Bulb	Wet Bulb	
Test Condition 1	80	67	95	75	Full
Test Condition 2	80	67	92	72.5	Full
Test Condition 3	80	67	87	69	Intermediate
Test Condition 4	80	67	82	65	Low

Replace Section 5.1 to read as follows:

Calculate the condition-specific cooling capacity (expressed in Btu/h), $Capacity_{tc}$, for each of the four cooling mode rating test conditions (tc), as required in section 6.1 of ANSI/AHAM RAC-1 (incorporated by reference; see 10 CFR 430.3) and in accordance with ANSI/ASHRAE 16 (incorporated by reference; see 10 CFR 430.3). Notwithstanding the requirements of 10 CFR 430.23(f), when reporting cooling capacity pursuant to 10 CFR 429.15(b)(2) and calculating energy consumption and costs pursuant to 10 CFR 430.23(f), use the cooling capacity determined for test condition 1 in Table 1 of this appendix.

Replace Section 5.2 to read as follows:

Determine the condition-specific electrical power input (expressed in watts), P_{tc} , for each of the four cooling mode rating test conditions, as required by section 6.5 of ANSI/AHAM RAC-1 (incorporated by reference; see 10 CFR 430.3) and in accordance with ANSI/ASHRAE 16 (incorporated by reference; see 10 CFR 430.3). Notwithstanding the requirements of 10 CFR 430.23(f), when reporting electrical power input pursuant to 10 CFR 429.15(b)(2) and calculating energy consumption and costs pursuant to 10 CFR 430.23(f)(5), use the electrical power input value measured for test condition 1 in Table 1 of this appendix. Notwithstanding

the requirements of 10 CFR 430.23(f), when calculating energy consumption and costs pursuant to 10 CFR 430.23(f)(3), use the weighted electrical power input, P_{wt} , calculated in section 5.2.1 of this appendix, as the electrical power input.

Insert a new Section 5.2.1:

5.2.1 *Weighted electrical power input.* Calculate the weighted electrical power input in cooling mode, P_{wt} , expressed in watts, as follows:

$$P_{wt} = \sum_{tc} P_{tc} \times W_{tc}$$

Where:

P_{wt} = weighted electrical power input, in watts, in cooling mode.

P_{tc} = electrical power input, in watts, in cooling mode for each test condition in Table 1 of this appendix.

W_{tc} = weighting factors for each cooling mode test condition: 0.05 for test condition 1, 0.16 for test condition 2, 0.31 for test condition 3, and 0.48 for test condition 4.

tc represents the cooling mode test condition: “1” for test condition 1 (95 °F condenser inlet dry-bulb temperature), “2” for test condition 2 (92 °F), “3” for test condition 3 (87 °F), and “4” for test condition 4 (82 °F).

Add a new Section 5.4, following Section 5.3 *Standby mode and off mode annual energy consumption*:

5.4 *Variable-speed room air conditioner unit’s performance adjustment factor.* Calculate the performance adjustment factor (F_p) as follows:

5.4.1 *Theoretical comparable single-speed room air conditioner.* Calculate the cooling capacity, expressed in British thermal units per hour (Btu/h), and electrical power input, expressed in watts, for a theoretical comparable single-speed room air conditioner at all cooling mode test conditions.

$$\text{Capacity}_{ss_tc} = \text{Capacity}_1 \times (1 + (M_c \times (95 - T_{tc})))$$

$$P_{ss_tc} = P_1 \times (1 - (M_p \times (95 - T_{tc})))$$

Where:

Capacity_{ss_tc} = theoretical comparable single-speed room air conditioner cooling capacity, in Btu/h, calculated for each of the cooling mode test conditions in Table 1 of this appendix.

Capacity_1 = variable-speed room air conditioner unit's cooling capacity, in Btu/h, measured in section 5.1 of this appendix for test condition 1 in Table 1 of this appendix.

P_{ss_tc} = theoretical comparable single-speed room air conditioner electrical power input, in watts, calculated for each of the cooling mode test conditions in Table 1 of this appendix.

P_1 = variable-speed room air conditioner unit's electrical power input, in watts, measured in section 5.2 of this appendix for test condition 1 in Table 1 of this appendix.

M_c = adjustment factor to determine the increased capacity at lower outdoor test conditions, 0.0099.

M_p = adjustment factor to determine the reduced electrical power input at lower outdoor test conditions, 0.0076.

T_{tc} = condenser inlet dry-bulb temperature for each of the test conditions in Table 1 of this appendix (in °F).

95 is the condenser inlet dry-bulb temperature for test condition 1 in Table 1 of this appendix, 95 °F.

tc as explained in section 5.2.1 of this appendix.

5.4.2 Variable-speed room air conditioner unit's annual energy consumption for cooling mode at each cooling mode test condition. Calculate the annual energy consumption for cooling mode under each test condition, AEC_{tc} , expressed in kilowatt-hours per year (kWh/year), as follows:

$$AEC_{tc} = 0.75 \times P_{tc}$$

Where:

AEC_{tc} = variable-speed room air conditioner unit's annual energy consumption, in kWh/year, in cooling mode for each test condition in Table 1 of this appendix.

P_{tc} as defined in section 5.2.1 of this appendix.

tc as explained in section 5.2.1 of this appendix.

0.75 is 750 annual operating hours in cooling mode multiplied by a 0.001 kWh/Wh conversion factor from watt-hours to kilowatt-hours.

5.4.3 Theoretical comparable single-speed room air conditioner annual energy consumption for cooling mode at each cooling mode test condition. Calculate the annual energy consumption for a theoretical comparable single-speed room air conditioner for cooling mode under each test condition, AEC_{ss_tc} , expressed in kWh/year.

$$AEC_{ss_tc} = 0.75 \times P_{ss_tc}$$

Where:

AEC_{ss_tc} = theoretical comparable single-speed room air conditioner annual energy consumption, in kWh/year, in cooling mode for each test condition in Table 1 of this appendix.

P_{ss_tc} = theoretical comparable single-speed room air conditioner electrical power input, in watts, in cooling mode for each test condition in Table 1 of this appendix, calculated in section 5.4.1 of this appendix.

tc as explained in section 5.2.1 of this appendix.

0.75 as defined in section 5.4.2 of this appendix.

5.4.4 Variable-speed room air conditioner unit's combined energy efficiency ratio at each cooling mode test condition. Calculate the variable-speed room air conditioner unit's combined energy efficiency ratio, $CEER_{tc}$, for each test condition, expressed in Btu/Wh.

$$CEER_{tc} = \frac{Capacity_{tc}}{\left(\frac{AEC_{tc} + E_{TSO}}{0.75} \right)}$$

Where:

$CEER_{tc}$ = variable-speed room air conditioner unit's combined energy efficiency ratio, in Btu/Wh, for each test condition in Table 1 of this appendix.

$Capacity_{tc}$ = variable-speed room air conditioner unit's cooling capacity, in Btu/h, for each test condition in Table 1 of this appendix, measured in section 5.1 of this appendix.

AEC_{tc} = variable-speed room air conditioner unit's annual energy consumption, in kWh/yr, in cooling mode for each test condition in Table 1 of this appendix, calculated in section 5.4.2 of this appendix.

E_{TSO} = standby mode and off mode annual energy consumption for room air conditioners, in kWh/year, calculated in section 5.3 of this appendix.

tc as explained in section 5.2.1 of this appendix.

0.75 as defined in section 5.4.2 of this appendix.

5.4.5 Theoretical comparable single-speed room air conditioner combined energy efficiency ratio at each cooling mode test condition. Calculate the combined energy efficiency ratio for a theoretical comparable single-speed room air conditioner, $CEER_{ss_tc}$, for each test condition, expressed in Btu/Wh.

$$CEER_{ss_tc} = \frac{Capacity_{ss_tc}}{\left(\frac{AEC_{ss_tc} + E_{TSO}}{0.75} \right)}$$

Where:

$CEER_{ss_tc}$ = theoretical comparable single-speed room air conditioner combined energy efficiency ratio, in Btu/Wh, for each test condition in Table 1 of this appendix.

$Capacity_{ss_tc}$ = theoretical comparable single-speed room air conditioner cooling capacity, in Btu/h, for each test condition in Table 1 of this appendix, in Btu/h, calculated in section 5.4.1 of this appendix.

AEC_{ss_tc} = theoretical comparable single-speed room air conditioner annual energy consumption for each test condition in Table 1 of this appendix, in kWh/year, calculated in section 5.4.3 of this appendix.

E_{TSO} = standby mode and off mode annual energy consumption for room air conditioners, in kWh/year, calculated in section 5.3 of this appendix.

tc as explained in section 5.2.1 of this appendix.

0.75 as defined in section 5.4.2 of this appendix.

5.4.6 *Theoretical comparable single-speed room air conditioner adjusted combined energy efficiency ratio for each cooling mode test condition.* Calculate the adjusted combined energy efficiency ratio for a theoretical comparable single-speed room air conditioner, $CEER_{ss_tc_adj}$, with cycling losses considered, expressed in Btu/Wh.

$$CEER_{ss_tc_adj} = CEER_{ss_tc} \times CLF_{tc}$$

Where:

$CEER_{ss_tc_adj}$ = theoretical comparable single-speed room air conditioner adjusted combined energy efficiency ratio, in Btu/Wh, for each test condition in Table 1 of this appendix.

$CEER_{ss_tc}$ = theoretical comparable single-speed room air conditioner adjusted combined energy efficiency ratio, in Btu/Wh, for each test condition in Table 1 of this appendix, calculated in section 5.4.5 of this appendix.

CLF_{tc} = cycling loss factor for each cooling mode test condition: 1 for test condition 1, 0.971 for test condition 2, 0.923 for test condition 3, and 0.875 for test condition 4.

tc as explained in section 5.2.1 of this appendix.

5.4.7 *Weighted combined energy efficiency ratio.* Calculate the weighted combined energy efficiency ratio for the variable-speed room air conditioner unit, $CEER_{wt}$, and theoretical comparable single-speed room air conditioner, $CEER_{ss_wt}$, expressed in Btu/Wh.

$$CEER_{wt} = \sum_{tc} CEER_{tc} \times W_{tc}$$

$$CEER_{ss_wt} = \sum_{tc} CEER_{ss_tc_adj} \times W_{tc}$$

Where:

$CEER_{wt}$ = variable-speed room air conditioner unit's weighted combined energy efficiency ratio, in Btu/Wh.

$CEER_{ss_wt}$ = theoretical comparable single-speed room air conditioner weighted combined energy efficiency ratio, in Btu/Wh.

$CEER_{tc}$ = variable-speed room air conditioner unit's combined energy efficiency ratio, in Btu/Wh, at each test condition in Table 1 of this appendix, calculated in section 5.4.4 of this appendix.

$CEER_{ss_tc_adj}$ = theoretical comparable single-speed room air conditioner adjusted combined energy efficiency ratio, in Btu/Wh, at each test condition in Table 1 of this appendix, calculated in section 5.4.6 of this appendix.

W_{tc} as defined in section 5.2.1 of this appendix.

tc as explained in section 5.2.1 of this appendix.

5.4.8 Variable-speed room air conditioner unit's performance adjustment factor.

Calculate the variable-speed room air conditioner unit's performance adjustment factor, F_p .

$$F_p = \frac{(CEER_{wt} - CEER_{ss_wt})}{CEER_{ss_wt}}$$

Where:

F_p = variable-speed room air conditioner unit's performance adjustment factor.

$CEER_{wt}$ = variable-speed room air conditioner unit's weighted combined energy efficiency ratio, in Btu/Wh, calculated in section 5.4.7 of this appendix.

$CEER_{ss_wt}$ = theoretical comparable single-speed room air conditioner weighted combined energy efficiency ratio, in Btu/Wh, calculated in section 5.4.7 of this appendix.

(3) *Representations.* GEA may not make representations about the efficiency of a basic model listed in paragraph (1) for compliance, marketing, or other purposes unless that the basic model has been tested in accordance with the provisions set forth above and such representations fairly disclose the results of such testing.

(4) This Interim Waiver Order shall remain in effect according to the provisions of 10 CFR 430.27.

(5) This Interim Waiver Order is issued on the condition that the statements, representations, test data, and documents provided by GEA are valid. If GEA makes any modifications to the controls or configurations of a basic model subject to this Interim Waiver Order, such modifications will render the waiver invalid with respect to that basic model, and GEA will either be required to use the current Federal test method or submit a new application for a test procedure waiver. DOE may rescind or modify this waiver at any time if it determines the factual basis underlying the petition for the Interim Waiver Order is incorrect, or the results from the alternate test procedure are unrepresentative of the basic model's true energy consumption characteristics. 10 CFR 430.27(k)(1). Likewise, GEA may request that DOE rescind or modify the Interim Waiver Order if GEA discovers an error in the information provided to DOE as part of its petition, determines that the interim waiver is no longer needed, or for other appropriate reasons. 10 CFR 430.27(k)(2).

(6) GEA remains obligated to fulfill any certification requirements set forth at 10 CFR part 429.

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. GEA may submit a new or amended petition for waiver and request for grant of interim waiver, as appropriate, for additional basic models of room air conditioners. Alternatively, if appropriate, GEA may request that DOE extend the scope of a waiver or an interim waiver to include additional basic models employing the same technology as the basic model(s) set forth in the original petition consistent with 10 CFR 430.27(g).

Signed in Washington, DC, on September 18, 2020

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

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June 2, 2020

Via Email (AS_Waiver_Requests@ee.doe.gov)

Mr. Daniel Simmons
Assistant Secretary of Energy Efficiency and Renewable Energy
U.S. Department of Energy
Building Technologies Program, Test Procedure Waiver
1000 Independence Avenue, SW
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Re: Petition for Waiver & Application for Interim Waiver Regarding Test Procedure for Room Air Conditioners, Using 10 CFR Part 430, Subpart B, Appendix F.

Dear Asst. Sec. Simmons:

GE Appliances, a Haier company (GEA) respectfully submits this Petition for Waiver and Application for Interim Waiver from the Department of Energy (DOE) test procedure for Room Air Conditioners in 10 CFR 430 Subpart B, Appendix F. GEA's request is fully consistent with the previously granted interim waivers provided to LG Electronics USA, Inc. "LG" [Case Number 2018-003; EERE-2018-BT-WAV-0006] 84 FR 20111 and GD Midea Air Conditioning Equipment Co. LTD "Midea" [Case Number 2019-004; EERE-2019-BT-WAV-0009] 85 FR 31481.

GEA requests this waiver and interim waiver for the same reason as LG and Midea: the current test procedure does not accurately measure energy consumption for room air conditioners with Variable Speed Compressors (VSCs). GEA requests expedited treatment of this Petition and Application as DOE has considered this exact issue twice before and approved both petitions.

1. About GE Appliances

GEA is a leading, US manufacturer of home appliances. GEA offers a full suite of major appliances across seven brands as well as portable appliances. GEA has been a participant in and contributor to the DOE's home appliance energy conservation program since its founding more than 40 years ago. Indeed, GEA supports the goal of the appliance efficiency program: maximizing energy savings improvements that offer consumers real economic benefits and that do not diminish product performance. GEA devotes substantial resources to the development of new technologies to increase energy efficiency where they are feasible and engineering products to meet the demanding DOE energy efficiency requirements.

2. Basic Models for Which a Waiver is Requested

This Petition for Waiver and Application for Interim Waiver covers the residential room air conditioner basic models listed below.

Product Class 3 Without reverse cycle, with louvered sides, and 8,000 to 13,999 Btu/h	Product Class 4 Without reverse cycle, with louvered sides, and 14,000 to 19,999 Btu/h	Product Class 5 Without reverse cycle, with louvered sides, and 20,000 to 27,999 Btu/h
AHNR08AC	AHNR14AC	AHNR24AC
AHNR10AC	AHNR18AC	AHTR24AC
AHNR12AC	AHTR14AC	AKNR24AC
AHTR08AC	AHTR18AC	
AHTR10AC	AKNR14AC	
AHTR12AC	AKNR18AC	
AKNR08AC		
AKNR10AC		
AKNR12AC		

The basic models will be distributed in commerce under the brand name “GE”.

3. Design Characteristic Constituting Grounds for the Petition

The basic models listed utilize a VSC design. The models automatically adjust compressor speed based on detected conditions allowing for more efficient operation under part-load conditions. The compressor varies its rotational speed based on the heating load in the room. As the outdoor temperature drops, the heat load on the room drops as well. The air conditioner detects this changing heat load by comparing room temperature to a consumer setpoint. As the room temperature approaches the consumer setpoint, the compressor speed slows and thus reduces cooling capacity and input watts. This allows the compressor to run longer periods without cycling on and off, which improves efficiency and results in energy savings. This improvement in efficiency is not captured in the current DOE test procedure, which allows for testing at full-load performance only. The current DOE test procedure disincentivizes manufacturers from bringing this energy saving technology to the market. Without a waiver, the energy savings of this technology cannot be communicated to consumers and the increased cost to manufacture these more efficient units cannot be recouped by manufacturers.

4. Requirements Sought to be Waived

The current test procedure in Appendix F requires testing in the full-load condition and does not take into account the energy savings achieved with the part-load characteristics of VSCs. As DOE stated when granting this same petition for LG, “DOE agrees that the current test procedure produces test results that are unrepresentative of actual energy use, and accordingly energy efficiency, for variable-speed room air conditioners”. 84 FR 20113. Without a waiver, the basic models referenced above cannot be accurately tested and rated for energy consumption.

5. Manufacturers of All Other Basic Models with Similar Design Characteristics

To GEA's knowledge, the only other models with similar design characteristic are those listed in LG's and Midea's granted waivers, which are cited above.

6. The Proposed Alternate Test Procedure Has Been Approved Twice by DOE

GEA requests that the alternate test procedure prescribed by DOE in the LG waiver order at 84 FR 20118 - 20121 be used to measure the energy efficiency for the basic models referenced above. The approach and test procedure specified in the order cover room air conditioners with VSCs and are applicable to the referenced basic models' design. The alternate test procedure requires testing at four test conditions as specified in Table 1 of the LG waiver order. These conditions reflect operation under part-load conditions and more accurately measure energy consumption for the basic models.

The test setup instructions for maintaining the compressor speeds at each test condition when testing in accordance with this waiver request are included in Exhibit A. Initial test data from tests conducted on select basic models in accordance with this waiver request are included in Exhibit B. The documents in Exhibits A and B have been marked as confidential business information pursuant to 10 CFR 1004.11.

7. The Application for Interim Waiver Should Be Granted

a. The Petition for Waiver Will Likely be Successful

This Petition for Waiver is likely to be granted as substantively identical waivers have already been granted to LG and Midea. Further, the waiver is needed as there is no dispute among stakeholders, as seen in the responses to the LG and Midea waiver requests, that the current test method does not accurately measure the energy consumption for the basic models and the proposed alternate method provides a means of accurate measurement. The alternate test procedure, previously approved by DOE, is applicable to the basic models' design characteristics and will evaluate the performance of the models in a manner representative of the actual energy consumption.

b. Failure to Provide and Interim Waiver Will Cause Economic Hardship and Competitive Disadvantage

If DOE does not promptly grant an interim waiver, GEA will likely be unable to incorporate VSCs into its room air conditioners for the 2021 season. The design and manufacture of room air conditioners requires long lead times and significant capital investments for design changes of this nature. Without prompt action by DOE, consumers will likely be deprived of greater choice for more energy efficient room air conditioners. Further, the failure to quickly grant an interim waiver will provide unreasonable competitive advantage to other manufacturers who have already been granted substantively identical waivers.

8. Notice to Other Manufacturers

Pursuant to 10 CFR 430.27(c), upon publication of a grant of interim waiver, GEA will notify in writing all known manufacturers of domestically marketed basic models of the same product class (as specified in 10 CFR 430.32) and of other product classes known to the petitioner to use the technology or have the characteristic at issue in the waiver. The notice will include a statement that DOE has published the interim waiver and petition for waiver in the Federal Register and the date the petition for waiver was published. The notice will also include a statement that DOE will receive and consider timely written comments on the petition for waiver.

Within five working days of publication of the grant of interim waiver, GEA will file with DOE a statement certifying the names and addresses of each person to whom a notice of the petition for waiver was sent.

9. Conclusion

GEA respectfully requests that DOE grant this Petition for Waiver and Application for Interim Waiver from the current test procedure for the specified basic models. As DOE has already twice reviewed and approved identical requests for other manufacturers, GEA requests expedited review and approval of the application for Interim Waiver. DOE's approval of GEA's request will ensure consumers have the greatest access to this important, energy-saving technology.

Very truly yours,
/s/
John T. Schlafer

Attachments:

Exhibit A - Test Setup Instructions

Exhibit B - Preliminary Test Data

Exhibit A - Test Setup Instructions

[Redacted]

Exhibit B – Preliminary Test Data

[Redacted]

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