[6450-01-P]

DEPARTMENT OF ENERGY

10 CFR Part 430

[EERE-2016-BT-TP-0012]

Energy Conservation Program: Test Procedure for Dishwashers

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

ACTION: Request for information.

SUMMARY: The U.S. Department of Energy ("DOE") is initiating a data collection process through this request for information ("RFI") to consider whether to amend DOE's test procedure for consumer dishwashers. As part of this RFI, DOE seeks comment on whether there have been changes in product testing methodology or new products on the market since the last test procedure update that may create the need to make amendments to the test procedure for dishwashers. Specifically, DOE seeks data and information that could enable the agency to propose that the current test procedure produces results that are representative of an average use cycle for the product and is not unduly burdensome to conduct, and therefore does not need amendment. To inform interested parties and to facilitate this process, DOE has also gathered data, identifying several issues associated with the currently applicable test procedures on which DOE is interested in receiving comment. The issues outlined in this document mainly concern consumer usage patterns; appropriate testing conditions and methods; efficiency metrics; and any additional topics that may inform DOE's decision whether to conduct a future test procedure

rulemaking. DOE welcomes written comments from the public on any subject within the scope of this document (including topics not raised in this RFI).

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 *http://www.regulations.gov.* Follow the instructions for submitting comments. Alternatively, interested persons may submit comments, identified by docket number EERE–2016-BT-TP-0012, by any of the following methods:

1. *Federal eRulemaking Portal*: *http://www.regulations.gov.* Follow the instructions for submitting comments.
2. *E-mail*: *ResDishwasher2016TP0012@ee.doe.gov*. Include docket number EERE–2016-BT-TP-0012 in the subject line of the message.
3. *Postal Mail*: Appliance and Equipment Standards Program, U.S. Department of Energy, Building Technologies Office, Mailstop EE-5B, 1000 Independence Avenue, SW., Washington, DC, 20585-0121. Telephone: (202) 287-1445. If possible, please submit all items on a compact disc ("CD"), in which case it is not necessary to include printed copies.
4. *Hand Delivery/Courier*: Appliance and Equipment Standards Program, U.S. Department of Energy, Building Technologies Office, 950 L'Enfant Plaza, SW., Suite 600, Washington, 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 section III 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 *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://www1.eere.energy.gov/buildings/appliance_standards/standards.aspx?productid=38&action=viewlive*. The docket web page contains simple instructions on how to access all documents, including public comments, in the docket. See section III for information on how to submit comments through *http://www.regulations.gov.*

FOR FURTHER INFORMATION CONTACT: Mr. Bryan Berringer, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office, EE-5B, 1000 Independence Avenue, SW, Washington, DC, 20585-0121. Telephone: (202) 586-0371. E-mail: *ApplianceStandardsQuestions@ee.doe.gov*.

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

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

SUPPLEMENTARY INFORMATION:

Table of Contents

I. Introduction

Consumer dishwashers are included in the list of "covered products" for which DOE is authorized to establish and amend energy conservation standards and test procedures. (42 U.S.C. 6292(a)(6)) DOE's test procedures for consumer dishwashers are prescribed at Title 10 of the Code of Federal Regulations ("CFR") part 430, subpart B, appendix C1 ("appendix C1"). The following sections discuss DOE's authority to establish and amend test procedures for consumer dishwashers, as well as relevant background information regarding DOE's consideration of test procedures for this product.

A. Authority and Background

The Energy Policy and Conservation Act of 1975, as amended ("EPCA"),[1] among other things, authorizes DOE to regulate the energy efficiency of a number of consumer products and

[1] All references to EPCA in this document refer to the statute as amended through America's Water Infrastructure Act of 2018, Public Law 115-270 (October 23, 2018).

certain industrial equipment. (42 U.S.C. 6291–6317) Title III, Part B[2] of EPCA established the Energy Conservation Program for Consumer Products Other Than Automobiles, which sets forth a variety of provisions designed to improve energy efficiency. These products include consumer dishwashers, the subject of this RFI. (42 U.S.C. 6292(a)(6))

Under EPCA, DOE's energy conservation program consists essentially of four parts: (1) testing, (2) labeling, (3) Federal energy conservation standards, and (4) certification and enforcement procedures. Relevant provisions of the Act specifically include definitions (42 U.S.C. 6291), energy conservation standards (42 U.S.C. 6295), test procedures (42 U.S.C. 6293), labeling provisions (42 U.S.C. 6294), and the authority to require information and reports from manufacturers (42 U.S.C. 6296).

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

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) making representations about the efficiency of those consumer products (42 U.S.C. 6293(c)).

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

Similarly, DOE must use these test procedures to determine whether the products comply 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 must follow when prescribing or amending test procedures for covered products. EPCA requires that any test procedures prescribed or amended under this section be reasonably designed to produce test results which measure energy efficiency, energy use or estimated annual operating cost of a covered product during a representative average use cycle or period of use and not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3))

In addition, EPCA requires that DOE amend its test procedures for all covered products to integrate measures of standby mode and off mode energy consumption into the overall energy efficiency, energy consumption, or other energy descriptor, taking into consideration the most current versions of Standards 62301 and 62087 of the International Electrotechnical Commission ("IEC"), unless the current test procedure already incorporates the standby mode and off mode energy consumption, or if such integration is technically infeasible. (42 U.S.C. 6295(gg)(2)(A)) If an integrated test procedure is technically infeasible, DOE must prescribe separate standby mode and off mode energy use test procedures for the covered product, if a separate test is technically feasible. (*Id.*)

EPCA also requires that, at least once every 7 years, DOE evaluate test procedures for each type of covered product, including consumer dishwashers, to determine whether amended test procedures would more accurately or fully comply with the requirements for the test procedures to not be unduly burdensome to conduct and be reasonably designed to produce test

results that reflect energy efficiency, energy use, and estimated operating costs during a representative average use cycle or period of use. (42 U.S.C. 6293(b)(1)(A)) If the Secretary determines, on his own behalf or in response to a petition by any interested person, that a test procedure should be prescribed or amended, the Secretary shall promptly publish in the *Federal Register* proposed test procedures and afford interested persons an opportunity to present oral and written data, views, and arguments with respect to such procedures. The comment period on a proposed rule to amend a test procedure shall be at least 60 days and may not exceed 270 days. In prescribing or amending a test procedure, the Secretary shall take into account such information as the Secretary determines relevant to such procedure, including technological developments relating to energy use or energy efficiency of the type (or class) of covered products involved. (42 U.S.C. 6293(b)(2)) If DOE determines that test procedure revisions are not appropriate, DOE must publish its determination not to amend the test procedures. DOE is publishing this RFI to collect data and information to inform its decision in satisfaction of the 7-year review requirement specified in EPCA. (42 U.S.C. 6293(b)(1)(A))

B. Rulemaking History

DOE originally established its test procedure for consumer dishwashers in 1977 at 10 CFR part 430, subpart B, appendix C ("appendix C"). 42 FR 39964 (Aug. 8, 1977). Since that time, the test procedure has undergone a number of amendments. In 1983, DOE amended the test procedure to revise the representative average-use cycles to more accurately reflect consumer use and to address consumer dishwashers that use 120 degree Fahrenheit ("°F") inlet water. 48 FR 9202 (March 3, 1983). DOE amended the test procedure again in 1984 to redefine the term "water heating dishwasher." 49 FR 46533 (Nov. 27, 1984). In 1987, DOE amended the test procedure to address models that use 50 °F inlet water. 52 FR 47549 (Dec. 15, 1987). In

2001, DOE revised the test procedure's testing specifications to improve testing repeatability, amended the definitions of "compact dishwasher" and "standard dishwasher," and reduced the average number of use cycles per year from 322 to 264. 66 FR 65091 (Dec. 18, 2001). In 2003, DOE again revised the test procedure to more accurately measure consumer dishwasher efficiency, energy use, and water use. 68 FR 51887 (Aug. 29, 2003) ("August 2003 final rule"). The August 2003 final rule amendments included the following revisions: (1) the addition of a method to rate the efficiency of soil-sensing products, (2) the addition of a method to measure standby power, and (3) a reduction in the average-use cycles per year from 264 to 215. *Id*. On October 31, 2012, DOE established a new test procedure for consumer dishwashers in appendix C1. 77 FR 65941 ("October 2012 final rule"). Appendix C1 follows the same general procedures as those included in the previously used appendix C, with updates to: (1) revise the provisions for measuring energy consumption in standby mode or off mode; (2) add requirements for consumer dishwashers with water softeners to account for regeneration cycles; (3) require an additional preconditioning cycle; (4) include clarifications regarding certain definitions, test conditions, and test setup; and (5) replace obsolete test load items and soils. *Id.* at 65982–65987.

The current version of the test procedure includes provisions for determining estimated annual energy use ("EAEU") in kilowatt-hours per year ("kWh/year"), estimated annual operating cost ("EAOC") in dollars per year, and water consumption in gallons per cycle ("gal/cycle"). 10 CFR 430.23(c).

As of May 30, 2013, manufacturers must use appendix C1 to demonstrate compliance with DOE's energy conservations standards for dishwashers, which are set forth at 10 CFR

430.32(f)(3). The current energy conservation standards for consumer dishwashers are consistent with recommendations submitted to DOE by groups representing manufacturers, energy and environmental advocates, and consumer groups on July 30, 2010.[3] 77 FR 31918, 31919 (May 30, 2012).

On December 19, 2014, DOE published notice of proposed rulemaking ("NOPR") proposing amended energy conservation standards for dishwashers ("December 2014 NOPR"). 79 FR 76142. In response to the December 2014 NOPR, manufacturers and the Association of Home Appliance Manufacturers ("AHAM") commented that issues with the existing appendix C1 resulted in a flawed analysis for the proposed standards. (AHAM, No. 21 at pp. 12–14) [4] AHAM's comment, as well as other comments received on the issues with the test procedure, are addressed in greater detail in the relevant later sections of this document.

After considering comments received on the December 2014 NOPR and additional information, DOE conducted further analysis through which it concluded that amended standards for consumer dishwashers would not be economically justified. 81 FR 90072 (Dec. 13, 2016) ("December 2016 final determination"). In the December 2016 final determination, DOE also removed the obsolete version of appendix C. Based on consideration of the concerns raised by

[3] This collective set of comments, titled "Agreement on Minimum Federal Efficiency Standards, Smart Appliances, Federal Incentives and Related Matters for Specified Appliances" (the "Joint Petition"), recommended specific energy conservation standards for consumer dishwashers that, in the commenters' view, would satisfy the EPCA requirements. DOE conducted a rulemaking analysis on multiple consumer dishwasher efficiency levels, including those suggested in the Joint Petition. The Joint Petition is located in the DOE docket for the consumer dishwasher energy conservation standards rulemaking, Docket No. EERE–2011–BT–STD–0060, document number 1 and available for review at *https://www.regulations.gov/document?D=EERE-2011-BT-STD-0060-0001*.

[4] A notation in the form "AHAM, No. 21 at pp. 21-24" identifies a written comment: (1) made by the Association of Home Appliance Manufacturers; (2) recorded in document number 21 that is filed in the docket of that energy conservation standards rulemaking (Docket No. EERE–2014– BT–STD-0021) and available for review at *http://www.regulations.gov*; and (3) which appears on pages 12 through 14 of document number 21.

interested parties on certain aspects of the consumer dishwasher test procedure, DOE agreed in the December 2016 final determination that it would seek additional information on these issues. 81 FR 90072, 90076. DOE is publishing this RFI to solicit public information, data, and comments from all interested parties on these topics.

II. Request for Information

As an initial matter, DOE seeks comment on whether there have been changes in product testing methodology or new products on the market since the last test procedure update that may necessitate amendments to the test procedure for dishwashers. Specifically, DOE seeks data and information that could enable the agency to propose that the current test procedure produces results that are representative of an average use cycle for the product and is not unduly burdensome to conduct, and therefore does not need amendment. DOE also seeks information on whether an existing private-sector developed test procedure would produce such results and should be adopted by DOE rather than DOE establishing its own test procedure, either entirely or by adopting only certain provisions of one or more private-sector developed tests.

In the following sections, DOE has also identified a variety of issues on which it seeks input to determine whether amended test procedures for consumer dishwashers would more accurately or fully comply with the requirements in EPCA that test procedures: (1) be reasonably designed to produce test results which measure energy use during a representative average use cycle or period of use; and (2) not be unduly burdensome to conduct. (42 U.S.C. 6293(b)(3))

Additionally, DOE welcomes comments on other issues relevant to the conduct of this process that may not specifically be identified in this document. In particular, DOE notes that under Executive Order 13771, "Reducing Regulation and Controlling Regulatory Costs," Executive Branch agencies such as DOE are directed to manage the costs associated with the imposition of expenditures required to comply with Federal regulations. See 82 FR 9339 (Feb. 3, 2017). Consistent with that Executive Order, DOE encourages the public to provide input on measures DOE could take to lower the cost of its regulations applicable to consumer dishwashers consistent with the requirements of EPCA.

A. Scope and Definitions

A consumer dishwasher is a cabinet-like appliance which with the aid of water and detergent, washes, rinses, and dries (when a drying process is included) dishware, glassware, eating utensils, and most cooking utensils by chemical, mechanical and/or electrical means and discharges to the plumbing drainage system. 10 CFR 430.2. Products meeting this definition are subject to DOE's regulations for testing, certifying, and complying with energy conservation standards.

B. Energy and Water Consumption Test Procedure

As described, DOE's current energy conservation standards for consumer dishwashers are expressed in terms of EAEU, in kWh/year, and water consumption, in gal/cycle. 10 CFR 430.32(f)(1). The current test procedure at 10 CFR 430.23(c) includes provisions for determining these values as well as EAOC, based upon testing procedures in appendix C1.

In response to the December 2014 NOPR, DOE received a number of comments raising concern that certain aspects of the test procedure may not be reasonably designed to measure the energy use of dishwashers during a representative average use cycle or period of use. DOE also received feedback on concerns with repeatability and reproducibility of the appendix C1 test procedure. The following sections discuss each of these issues in greater detail.

1. Representativeness

In accordance with 42 U.S.C. 6293(b)(3), DOE's consumer dishwasher test procedure must be reasonably designed to produce test results that measure energy use, water use, and estimated annual operating cost of dishwashers during a representative average use cycle or period of use. In this RFI, DOE is requesting information on multiple aspects of the test procedure and whether these aspects appropriately reflect that of a representative average use cycle.

a. Cycle Selections

Sections 2.6.1, 2.6.2, and 2.6.3 of appendix C1 currently require testing of a dishwasher on the "normal" cycle, which is defined as the cycle recommended in the manufacturer's instructions for daily, regular, or typical use to completely wash a full load of normally soiled dishes including the power-dry feature. Section 1.12, appendix C1. Most consumer dishwashers available on the market offer multiple cycle selections. In response to the December 2014 NOPR, AHAM commented that were energy conservation standards to be set at more stringent levels, consumers may be more likely to select more energy and water-intensive cycle selections (*e.g.*, pots and pans) rather than the normal cycle to ensure the best cleaning performance. (AHAM, No. 21 at p. 9)

In response to AHAM's comment, DOE is requesting any available consumer usage data describing how frequently consumers select the normal cycle and other cycle types. DOE notes the availability of data gathered in the U.S. Energy Information Agency's ("EIA") 2015 *Residential Energy Consumption Survey* (*"RECS"*), which surveyed consumer use of normal (both with and without heated dry), heavy, light, and energy-saver cycle settings. DOE also seeks information on whether cycle selection varies based on a specific product's energy and water consumption.

Testing of the normal cycle requires testing with the manufacturer-recommended washing and drying temperature options. Section 1.12, appendix C1. DOE also requests information on additional cycle options that may be available with the normal cycle, including any temperature or drying options other than those recommended by the manufacturer, the means for consumers to select additional cycle options, and the frequency with which consumers select the options.

This information will also help DOE determine whether current or amended energy conservation standards, established based on the DOE test procedure, affect (or would affect) consumers' cycle selections. Using this information will help DOE ensure that DOE does not set standards such that energy and water use levels for the normal cycle result in consumers selecting more energy and water-intensive cycle options. In DOE's view, such standards would not meet the ECPA requirements for establishing standards that are technologically feasible and economically justified, and would save a significant amount of energy.

b. Power-Dry Feature

Appendix C1 accounts for operation of a dishwasher on the normal cycle with the power-dry feature selected. Appendix C1 also accounts for the option to eliminate use of the power-dry feature following the final rinse operation, *i.e.,* a truncated normal cycle. Section 1.22 of appendix C1 defines "truncated normal cycle" as the normal cycle interrupted to eliminate the power-dry feature after the termination of the last rinse operation. Section 1.14 of appendix C1 defines the "power-dry feature" as a feature that introduces electrically-generated heat into the washing chamber to improve the drying performance of the dishwasher. The drying energy consumption calculations in section 5.3 of appendix C1 account for the energy consumed by the power-dry feature after the termination of the last rinse option of the normal cycle.

The typical implementation of a power-dry feature had been to utilize an exposed resistance heater to heat the air inside the washing chamber after the final rinse to evaporate the water from the dishware. However, manufacturers have innovated additional technologies to improve drying.

Some consumer dishwasher models do not use a resistance heater to heat the air, but instead achieve drying by raising the temperature of the final rinse water. This increase in the temperature of the final rinse water is not addressed in the truncated normal cycle or drying energy consumption provisions, as it occurs as part of the final rinse and not after the final rinse.

DOE requests information and data on the extent to which manufacturers increase the temperature of the final rinse water as a means to improve drying performance. DOE further requests information on the extent to which manufacturers implement such a drying strategy as

part of the normal cycle, and whether and to what extent such units provide an option to eliminate this drying function. DOE also requests data and information on the energy use associated with increasing the temperature of the final rinse water as a means to improve drying performance, including any available options.

c. Test Load Items

Appendix C1 requires testing with four or eight place settings for compact and standard dishwashers, respectively.[5] Sections 2.6.2, 2.6.3.1, 2.6.3.2, 2.6.3.3, appendix C1. A place setting includes the following items: one cup, one saucer, one dinner plate, one bread and butter plate, one fruit bowl, one iced tea glass, one dinner fork, one salad fork, one knife, and two teaspoons. Section 2.7.2, appendix C1. Both compact and standard dishwashers are also loaded with six serving pieces: two serving bowls, one platter, one serving fork, and two serving spoons. Section 2.7.3, appendix C1. The place setting and serving piece specifications required in appendix C1 are consistent with those provided in American National Standards Institute ("ANSI")/AHAM Standard DW-1-2010, *Household Electric Dishwashers* ("ANSI/AHAM DW-1-2010").

Based on consumer dishwasher models certified in DOE's Compliance Certification Database as of March 2019, among a total of 895 standard-size models, 11 percent have a reported capacity of eight place settings, 70 percent have a capacity of 12 place settings, and 16 percent have a capacity that is greater than 12 place settings. Because appendix C1 specifies

[5] Section 1.4 of appendix C1 defines a "compact dishwasher" as having a capacity of less than eight place settings plus six serving pieces, as specified in ANSI/AHAM DW-1-2010. Section 1.20 of appendix C1 defines a "standard dishwasher" as having a capacity equal to or greater than eight place settings plus six serving pieces as specified in ANSI/AHAM DW-1-2010.

testing with eight place settings for a standard-size dishwasher, almost 89 percent of standard-size consumer dishwashers (*i.e.* dishwashers with a capacity equal to or greater than eight place settings) are tested with a load that is smaller than the certified capacity. For example, a consumer dishwasher that is certified with a capacity of 12 place settings is classified as a standard dishwasher and is tested with eight place settings. DOE requests information on the typical number of place settings washed by consumers in each dishwasher cycle, as well as how the typical number of place settings relates to a dishwasher's overall capacity. DOE also requests information on whether the number of place settings affects energy and water consumption under appendix C1.

Additionally, DOE received feedback that the test load composition of place settings and serving pieces defined in section 2.7.1 of appendix C1 may not represent typical consumer loads. For example, the appendix C1 test load does not include any plastic items. DOE is aware of one industry test method, IEC Standard 60436, *Electric dishwashers for household use—Methods for measuring the performance* ("IEC 60436"), which includes a melamine bowl as one of the serving pieces in the test load. DOE requests information on whether introduction of plastic items could have an impact on energy or water use, as well as on the typical composition of place setting items, serving pieces, and flatware that are washed in consumer dishwashers, including the types of items (*e.g.*, cups, bowls, and plates) and their characteristics (*e.g.*, size and material).

d. Annual Number of Cycles

DOE's current test procedure calculates EAEU using 215 annual cycles. In the December 2014 NOPR and chapter 7 of its accompanying technical support document ("TSD")[6], DOE discussed the sources for this annual number of cycles as part of the energy and water use analysis. 79 FR 76142, 76156. DOE noted that the consumer dishwasher test procedure amendments in the August 2003 final rule relied on compiled survey data of consumers' dishwasher usage habits from a number of sources, including the 1997 *RECS*, several consumer dishwasher manufacturers, detergent manufacturers, energy and consumer interest groups, independent researchers, and government agencies. *Id.* These data yielded the average usage of 215 cycles per year. *Id.* DOE considered survey data from the 2009 version of *RECS,* but determined that because of the large data set used to develop the 215 cycle value, it would retain use of that value. *Id.* DOE also noted that 215 cycles per year is the number of cycles on which the EnergyGuide label administered by the Federal Trade Commission is based. *Id.*

In response to the December 2014 NOPR, AHAM commented that several newer editions of *RECS* data are available, including most recently (at that time) from the 2009 *RECS*. AHAM also noted that the 2009 *RECS* data include 12,100 households with 7,382 dishwashers, as compared to the 5,900 households in the 1997 *RECS*. Additionally, AHAM stated that the EIA has instituted a number of improvements to its methodology to increase the sample size and data accuracy of the 2009 survey. AHAM stated that as a result, the 2009 *RECS* data would be more appropriate to use than the 1997 *RECS* data. (AHAM, No. 21 at pp. 24–25) The Mercatus Center at George Mason University ("Mercatus Center") commented that the number of cycles

[6] Available at *https://www.regulations.gov/document?D=EERE-2014-BT-STD-0021-0005*.

per year used for the December 2014 NOPR analysis relied on a survey from 2001, which occurred during an extended period of decreasing household sizes and reduction in food preparation. (Mercatus Center, No. 11 at p. 7)

As discussed in chapter 7 of the final rule TSD accompanying the December 2016 final determination, the 2009 *RECS* data provide information on the number of cycles per week for each household using a consumer dishwasher, categorized in the following bins: (1) less than once per week, (2) once per week, (3) 2–3 times per week, (4) 4–6 times per week, and (5) at least once per day. Because the *RECS* data do not include point estimates of usage, DOE considered survey data it used to develop the amendments in the August 2003 final rule, which included data from a 2001 Arthur D. Little survey,[7] and that were analyzed again as part of the October 2012 final rule to estimate the average number of consumer dishwasher cycles per year.[8] DOE converted the information from the 2009 *RECS* to annual values. The data from the 2009 *RECS* indicate an average of 204 annual cycles (rather than 245 as derived from the 1997 *RECS*). Incorporating this value with the additional survey data used in the August 2003 final rule suggests a value of 207 average annual cycles.

DOE requests any additional information on annual consumer use of dishwashers, including on the appropriateness of the analysis that incorporates the 2009 *RECS* data and whether it results in a representative annual usage estimate. DOE also seeks feedback on the

[7] 68 FR 51887, 51889-51890.
[8] 77 FR 31918, 31932.

suitability of data from the 2015 *RECS*, which directly asks for the typical number of dishwasher cycles per week rather than providing binned response options.

e. Soils

The August 2003 final rule amended the consumer dishwasher test procedure to account for the varying energy and water performance of units that include soil sensors. 68 FR 51887, 51890, 51893. In that rulemaking, DOE relied on survey data gathered by Arthur D. Little ("ADL")[9] to characterize the quantity of soils that consumers load into a dishwasher. Using the soil loads from an earlier version of AHAM DW-1[10] as a reference point, the ADL report defined a light soil load as half the quantity of a single soiled place setting as defined in AHAM DW-1. A medium soil load was equivalent to two soiled AHAM DW-1 place settings and a heavy soil load was approximately equal to four soiled AHAM DW-1 place settings. With these load size definitions, ADL found that consumers most frequently washed lightly soiled loads (62 percent of loads), with medium (33 percent) and heavy (5 percent) soil loads making up the remainder. The appendix C1 test procedure assumes the same distribution of soil loads as identified in the ADL report.

In response to the December 2014 NOPR, Samsung Electronics America, Inc. ("Samsung") commented that the soil loads in the current DOE test procedure, including the heavy soil load, appear to reflect consumer pre-rinsing. Samsung proposed that the DOE test procedure be updated to reflect the soiling condition without pre-rinsing to encourage consumer

[9] ADL survey data are available at *https://www.regulations.gov/document?D=EERE-2006-TP-0096-0055*.
[10] Although not identical to the soil loads in ANSI/AHAM DW-1-2010, they are substantially similar.

dishwasher cycles to be designed for the soiling condition without pre-rinsing. Samsung suggested soiling levels per AHAM DW-1-2009[11] could represent soiling condition without pre-rinsing. Samsung asserted that adopting more stringent standards without amending the test procedure accordingly would drive consumer dishwasher cycle designs that use less energy and water under the DOE soil condition, but use significantly more water and energy under consumer usage with no pre-rinsing. (Samsung, No. 19 at pp. 1–2) AHAM asserted that under the standards proposed in the December 2014 NOPR, consumers would pre-rinse dishes before placing them in the dishwasher, significantly increasing water use. (AHAM, No. 21 at p. 9)

DOE requests information on whether consumer loads have changed since the survey data gathered in support of the August 2003 final rule. Specifically, DOE requests data or survey information regarding soiling conditions and the frequency of pre-rinsing to inform whether any changes to the current soil loads are warranted.

In addition to the quantity of soils loaded into the dishwasher, DOE seeks information on whether the types of soil required in appendix C1 result in a test method that measures energy and water use during a representative use cycle or period of use. The soil types are defined by ANSI/AHAM DW-1-2010; however, appendix C1 does not require flatware or serving pieces to be soiled. These soils include: eggs, corn, oatmeal, potatoes, a ground beef mixture, raspberry preserves, coffee (including coffee grounds), and tomato juice. DOE notes that the ANSI/AHAM DW-1-2010 soil load also includes peanut butter, which is not used in appendix C1 testing. Appendix C1 requires drying the soils on the test load items for approximately 2

[11] The soil loads in AHAM DW-1-2009 are identical to those in ANSI/AHAM DW-1-2010.

hours before loading into the dishwasher. DOE notes that other industry test procedures, such as IEC 60436, include different soil types, soiling methods, and longer drying or baking-on periods for the soils.

In response to the December 2014 NOPR, AHAM and a group of its members gathered data on soils and cleaning performance and presented the information to DOE in a meeting on July 8, 2015.[12] An AHAM member tested three consumer dishwashers with varying energy and water consumptions, one at the current baseline, one at the standard level proposed in the December 2014 NOPR, and one at an intermediate level (at 255 kWh/year and 3.1 gal/cycle). The three dishwashers were evaluated by the manufacturer on their ability to remove adhered ANSI/AHAM DW-1-2010 soils and additional fats and grease. The information AHAM provided indicated that the dishwashers with energy and water consumptions less than the baseline may have more difficulty removing certain grease and adhered soils compared to dishwashers that just meet the current standard level. (AHAM, No. 27 at pp. 2–13)

DOE requests information on the typical mix of soils consumers load into their dishwashers, on the appropriateness of the current composition of soil loads in appendix C1, and on whether the appendix C1 soil loads should be updated to incorporate different types of soils, including any additional fats or greases.

[12] A summary of the meeting and the materials presented at this meeting are available at document ID EERE-2014-BT-STD-0021-0027 on *http://www.regulations.gov*.

f. Loading Pattern

Section 2.6 of appendix C1 references section 5.8 of ANSI/AHAM DW-1-2010 for loading instructions. That section requires loading in accordance with the manufacturer's recommendation. AHAM stated that appendix C1's lack of loading specificity is a source of test procedure uncertainty. (AHAM, No. 21 at pp. 13–14) The test load in appendix C1 includes a mix of soiled and unsoiled items, whereas every item in an ANSI/AHAM DW-1-2010 test load is soiled. Manufacturers do not provide instructions for loading a mix of soiled and clean items. The positioning of soiled items relative to unsoiled items may impact the rate at which soils are removed from the test load items, which may impact soil sensor responses.

DOE requests feedback on whether any additional instructions are needed beyond referencing a manufacturer's loading recommendation.

DOE also requests information on how consumers typically load dishwashers. Although manufacturer instructions may optimize loading patterns to maximize loading capacity and dishwasher performance, consumers may use other loading positions and alignment, leading to variability in dishwasher performance.

g. Preconditioning Cycles

Section 2.9 of appendix C1 specifies that two preconditioning cycles must be run prior to the energy and water consumption test cycles. The purpose of the pre-conditioning cycles is to ensure that the water lines and sump area of the pump are primed, as well as to ensure that the soil sensors are calibrated for soil-sensing dishwashers. Section 2.9 also specifies that the prewash, if any, and main wash fill water volumes from the second preconditioning cycle must

be measured to calculate the detergent amounts to be used during the energy and water consumption tests. DOE requests comment on whether two preconditioning cycles are adequate or more than is necessary to calibrate the soil sensors on all soil-sensing dishwashers. DOE also requests comment on whether using the water volumes from the second preconditioning cycle would be appropriate for determining the detergent amounts if the sensors are still being calibrated during this second preconditioning cycle.

h. Detergent

The detergent formulation used in appendix C1 is Cascade with the Grease Fighting Power of Dawn powder. Section 2.10, appendix C1. Appendix C1 specifies that the amount of detergent to be used for testing is half of the quantity specified in ANSI/AHAM DW-1-2010, calculated based on the pre-wash and main wash fill volumes. *Id.* DOE introduced specifications for detergent quantity at the time it incorporated soiled loads into the DOE test procedure. 68 FR 51887, 51890–51891. In that rulemaking, interested parties commented that detergent dosing impacts a consumer dishwasher's cleaning performance but not energy consumption. *Id.* Identification of the specific detergent was subsequently added in the October 2012 final rule. 77 FR 65941, 65965.

In response to the December 2014 NOPR, AHAM commented that the detergent quantity requirements are subject to different interpretations between test laboratories, as observed during AHAM's round robin testing. Specifically, AHAM described difficulty in distinguishing pre-wash and main wash fills from each other and from any subsequent rinse fills. AHAM stated that this leads to test laboratories using different fill volumes in the detergent concentration calculations, resulting in different detergent dosing that will impact both energy and cleaning

performance test results. (AHAM, No. 21 at p. 13) DOE has observed that some consumer dishwashers use a combination of fills and partial drains during the initial wash portions of the cycle, creating potential difficulty in distinguishing between the pre-wash and main wash portions of the cycle and the corresponding quantities of water remaining in the test unit.

DOE has also received feedback that consumers are increasingly moving from powder or liquid detergents to single-dose detergents (*e.g.*, capsules or pods). Therefore, basing the detergent dosing on the wash fill volumes may not be representative of consumer use if consumers more frequently use a single dose or fixed quantity of powder or liquid detergent for every dishwasher cycle regardless of the cycle selection or soil load.

DOE requests information on whether the current powder detergent results in a test procedure reasonably designed to measure energy or water use during a representative use cycle or period of use. DOE also requests comment on whether the test procedure should continue to require calculating the detergent dosing based on the measured water fill volumes, or whether specifying a fixed amount of detergent, either in powder or single-dose form, would be more appropriate. If calculated detergent dosages are appropriate, DOE requests information on methods to differentiate between the different portions of a wash cycle and how to appropriately calculate the corresponding detergent dosing. DOE notes that certain manufacturers include dosing recommendations in their user guides and requests feedback on whether the detergent dosing for testing should reference any such recommendations.

Additionally, DOE has received feedback from manufacturers that the formulations of commercially available detergents often change significantly. Detergent manufacturers may

make periodic adjustments to detergent composition, resulting in different performance characteristics depending on when and where the detergent was purchased. To address this issue, IEC 60436 specifies the use of a reference detergent formulation. DOE requests information on whether the use of a reference detergent would be appropriate for the DOE test procedure.

i. Rinse Aid

Appendix C1 currently requires that testing be conducted without the use of rinse aid, and that any rinse aid reservoirs remain empty for testing. As part of the August 2003 final rule, DOE considered using rinse aid for testing that included soiled loads in the test procedure. 68 FR 51887, 51890–51891. Interested parties commented that rinse aid affects drying performance but would not impact a consumer dishwasher's energy performance. *Id.*

DOE notes that IEC 60436 specifies the use of a standard rinse aid formulation rather than a commercially marketed brand. DOE requests information on consumer use of rinse aid, and on whether the use of rinse aid has any effect on measured energy and water consumption.

j. Water Hardness

Appendix C1 does not currently specify any water hardness requirement for testing. The water hardness requirement in The ENERGY STAR *Test Method for Determining Dishwasher*

Cleaning Performance[13] is consistent with the requirement in ANSI/AHAM DW-1-2010, specifying a maximum water hardness of 85 parts per million ("ppm") of calcium carbonate.

In response to the December 2014 NOPR, AHAM commented that the lack of a water hardness requirement in the DOE test procedure may lead to variability in test results between test laboratories. (AHAM, No. 21 at p. 14)

DOE requests information on how water hardness may impact consumer dishwasher energy and water performance, and on the burden associated with including a water hardness requirement in the DOE test procedure. DOE also requests information on the hardness level of water used in current testing as compared to the water hardness level specified in ANSI/AHAM DW-1-2010, and the degree to which the water hardness level impacts whether the test procedure is reasonably designed to measure energy or water use during a representative use cycle or period of use .

k. Water Softener Regeneration Cycles

The dishwasher test procedure at appendix C1 specifies certain calculations for energy and water consumption, including calculations for dishwashers with water softener regeneration cycles.[14] Sections 5.1.3, 5.4.3, 5.5.1.2, 5.5.2.2, 5.6.1.2, and 5.6.2.2, appendix C1. In its review

[14] Hard water (water having calcium ion concentrations higher than 180 parts per million) prevents soaps and detergents from properly sudsing. To address this issue for those consumers that have hard water, some consumer dishwashers have a built-in water softening system. The water softener system may rely on a sodium resin that must be periodically recharged by flushing a saline solution over it, a process which is referred to as regeneration. During a cycle that includes a regeneration process, additional water is mixed with salt supplied by the consumer in a compartment separate from the detergent compartment to create the saline solution, and this incremental water consumption requires energy to heat it to the same temperature as is used for the active cycle.

[14] Hard water (water having calcium ion concentrations higher than 180 parts per million) prevents soaps and detergents from properly sudsing. To address this issue for those consumers that have hard water, some consumer

of these calculations, DOE observed that if a dishwasher has a water softener regeneration event at every or nearly every cycle (or, for the purposes of appendix C1, the dishwasher is certified to have approximately 215 regeneration cycles per year), the additional energy and water consumption associated with the water softener regeneration would likely already be accounted for in the measured energy and water use of the dishwasher. However, according to appendix C1, such a dishwasher would still be required to certify additional energy and water use associated with regeneration. DOE requests comment on whether such dishwashers exist that would run a regeneration at every or nearly every cycle, and whether any additional instructions should be specified in appendix C1 for such dishwashers.

l. Standby Testing

In response to the December 2014 NOPR, AHAM stated that appendix C1 does not currently specify whether standby testing is to be conducted with the door open or closed. AHAM believes this will have a significant impact on variability of the measured energy. (AHAM, No. 21 at p. 13) Section 4.2 of appendix C1 states to follow the test procedure in Section 5, Paragraph 5.3.2 of IEC 62301, which specifies setup according to the manufacturer's instructions for use. If no manufacturer instructions for use are provided, the factory or default settings shall be used. When there are no indications of factory or default settings, the product is tested as supplied.

dishwashers have a built-in water softening system. The water softener system may rely on a sodium resin that must be periodically recharged by flushing a saline solution over it, a process which is referred to as regeneration. During a cycle that includes a regeneration process, additional water is mixed with salt supplied by the consumer in a compartment separate from the detergent compartment to create the saline solution, and this incremental water consumption requires energy to heat it to the same temperature as is used for the active cycle.

DOE requests comment on whether testing with the door closed is representative of energy use in standby mode or off mode during a representative average use cycle or period of use (*i.e.*, the door is closed when the dishwasher is not in active mode). DOE also requests feedback on whether energy is consumed when the door is open, and if so, whether the energy consumption with the door open is significantly different from the energy consumed with the door closed.

m. Ambient Temperature

Section 2.5.1 of Appendix C1 currently specifies an ambient temperature of 75 °F ± 5 °F for active mode testing. In response to the December 2014 NOPR, AHAM commented that varying ambient temperatures can lead to different thermal hold times, which can lead to different measured energy results. AHAM stated that it was studying whether it is possible to tighten the allowable ambient temperature range in order to improve repeatability and reproducibility. (AHAM, No. 21 at p. 14) DOE welcomes input regarding the impacts of narrowing the allowable ambient temperature range on consumer dishwasher energy and water consumption, and whether this change would represent a burden for test facilities, and if so the extent of the burden.

n. Relative Humidity

Appendix C1 does not currently specify an ambient relative humidity for testing. In response to the December 2014 NOPR, AHAM noted that relative humidity can cause variation in energy testing results, and suggested that the DOE test procedure incorporate the relative humidity specification in ANSI/AHAM DW-1-2010, which according to AHAM is current industry practice. (AHAM, No. 21 at p. 14) DOE seeks input on whether ambient relative

humidity affects energy or water consumption, and whether test facilities already maintain an ambient relative humidity of 20 to 50 percent, as specified in ANSI/AHAM DW-1-2010. DOE requests information on what, if any, additional test burden would result from a relative humidity specification and the extent of any such burden.

2. Repeatability and Reproducibility

In response to the December 2014 NOPR, AHAM suggested that the repeatability and reproducibility of appendix C1 are not sufficient for the test procedure to be used as the basis for an energy conservation standards rulemaking. AHAM commented that its round robin testing demonstrated that appendix C1's repeatability and reproducibility needs to be improved. AHAM stated that it had been working over the past several years to identify potential sources of variation in the energy test, and to develop potential amendments to the DOE test procedure and ANSI/AHAM DW-1-2010 to address them. AHAM commented that repeatability and reproducibility would become more critical at more stringent standard levels. (AHAM, No. 21 at pp. 12–14)

In the December 2016 final determination, DOE stated that it would seek information on stakeholders' concerns regarding appendix C1. 81 FR 90072, 90076. In addition to the topics addressed in section II.B.1 of this document, DOE has observed in its testing that appendix C1 produces more consistent results from test to test for non-soil-sensing dishwashers than for soil-sensing dishwashers. For soil-sensing dishwashers, the sensor response for a given cycle appears to be the primary factor in the resulting variation in energy and water use results.

As discussed in section II.B.1.d of this document, survey data from ADL indicate that consumers typically load only a small amount of soils into their dishwashers. According to the ADL report, even the heaviest consumer soil loads (representing 5 percent of consumer dishwasher cycles) correspond to the equivalent of only four soiled place settings under the DOE test procedure. DOE observed in its tests under appendix C1 that this soil level typically triggers the lightest cycle response in soil-sensing dishwashers. However, DOE has occasionally observed a given soil load trigger a heavier cycle response (*i.e.* "outlier" cycle responses that use higher energy and/or water consumption), which can have a more pronounced impact when the heavier response occurs with the light or medium soil loads because those cycles are weighted more heavily in the overall calculations.

DOE is requesting information on the extent to which variable cycle responses for soil-sensing dishwashers are an issue with the DOE consumer dishwasher test procedure, and if so, how to address this issue. Specifically, DOE seeks information on whether variable cycle responses are an issue that may be addressed by further specifying test conditions, or if there is a certain amount of variability inherent to the dishwasher control schemes and whether such variability would also occur as part of a representative average use cycle or period of use. DOE is also interested in feedback on any other amendments to the test procedure that would ensure that the procedure is reasonably designed to measure the energy and water use of the dishwasher during a representative average use cycle or period of use.

C. Efficiency Metrics

DOE's test procedures in 10 CFR 430.23(c) and appendix C1 provide results for energy consumption in kWh/year and water consumption in gal/cycle. In response to the December

2014 NOPR, DOE received feedback that its existing product class structure may not be appropriate for consumer dishwasher regulations. The Mercatus Center stated that the current separation of consumer dishwashers into product classes on the basis of capacity without an identification of product characteristics that provide consumer utility is overly broad. (Mercatus Center, No. 11 at p. 5) The People's Republic of China ("China") stated that the standards proposed in the December 2014 NOPR are fixed values for the standard product class, and that these values may be too stringent for larger consumer dishwashers within the standard product class. China suggested a specific standard for these larger products. (China, No. 25 at p. 3)

One potential approach to address the comments raised by the Mercatus Center and China would be an energy and water use metric on a per-place setting basis. Such an approach would also eliminate the need for separate product classes based on capacity. DOE is requesting feedback on such a potential approach, including any data characterizing how the energy use of dishwashers on the market in the United States could be impacted by it.

D. Other Test Procedure Topics

1. Test Procedure Waivers

DOE has granted two test procedure waivers for the current consumer dishwasher test procedure. On April 10, 2017, DOE granted Miele, Inc. a test procedure waiver to allow for testing a specified basic model intended for a 208-volt power supply rather than the 115 volts or 240 volts specified in appendix C1.[15] 82 FR 17227. On November 1, 2013, DOE granted Whirlpool Corporation a test procedure waiver to allow for testing specified basic models

[15] See case No. DW-012.

equipped with a water use system, in which water from the final rinse cycle is stored for use in the next subsequent cycle, with periodic draining and cleaning events.[16] 78 FR 65629.

The test procedure waivers for these consumer dishwasher basic models provide alternate test provisions that are reasonably designed to measure energy and water use during a representative average use cycle or period of use for the basic models specified in the respective Orders. DOE requests feedback on whether the test procedure waiver approaches are generally appropriate for testing basic models with these features.

2. Other Topics

In addition to the issues identified earlier in this document, DOE welcomes comment on any other aspect of the existing test procedures for consumer dishwashers not already addressed by the specific areas identified in this document. DOE particularly seeks information to ensure that the test procedure is designed to measure energy and water use during a representative average use cycle or period of use, and is not unduly burdensome to conduct. DOE also requests information that would help DOE create a procedure that would limit manufacturer test burden through streamlining or simplifying testing requirements.

DOE also requests feedback on any potential amendments to the existing test procedure that could be considered to address impacts on manufacturers, including small businesses. DOE requests comment on the benefits and burdens of adopting any industry/voluntary consensus-based or other appropriate test procedure, without modification.

[16] See case No. DW-011.

DOE recently published an RFI on the emerging smart technology appliance and equipment market. 83 FR 46886 (Sept. 17, 2018). In that RFI, DOE sought information to better understand market trends and issues in the emerging market for appliances and commercial equipment that incorporate smart technology. DOE's intent in issuing the RFI was to ensure that DOE did not inadvertently impede such innovation in fulfilling its statutory obligations in setting efficiency standards for covered products and equipment. DOE seeks comments, data, and information on the issues presented in the "smart products" RFI as they may be applicable to dishwashers.

DOE also recently issued an RFI to seek more information on whether its test procedures are reasonably designed, as required by EPCA, to produce results that measure the energy use or efficiency of a product during a representative average use cycle or period of use. 84 FR 9721 (Mar. 18, 2019). DOE seeks comment on this issue as it pertains to the test procedure for dishwashers.

III. Submission of Comments

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 matters addressed in this notice and on other matters relevant to DOE's consideration of amended test procedures for consumer dishwashers. These comments and information will aid in the development of a test procedure NOPR for consumer dishwashers if DOE determines that amended test procedures may be appropriate for these products.

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 contact information will be viewable to DOE Building Technologies staff only. Your contact information will not be publicly viewable except for your first and last names, organization name (if any), and submitter representative name (if any). If your comment is not processed properly because of technical difficulties, DOE will use this information to contact you. If DOE cannot read your comment due to technical difficulties and cannot contact you for clarification, DOE may not be able to consider your comment.

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

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DOE processes submissions made through *http://www.regulations.gov* before posting. Normally, comments will be posted within a few days of being submitted. However, if large

volumes of comments are being processed simultaneously, your comment may not be viewable for up to several weeks. Please keep the comment tracking number that *http://www.regulations.gov* provides after you have successfully uploaded your comment.

Submitting comments via email, hand delivery, or 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. It is not necessary to submit printed copies. No facsimiles (faxes) will be accepted.

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

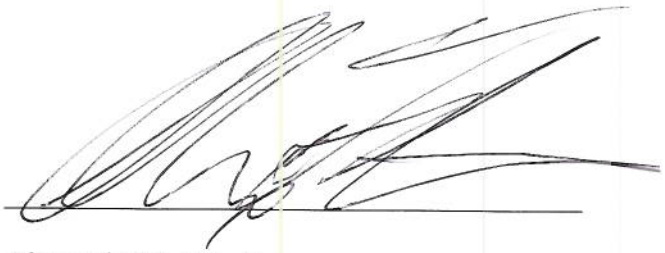
Campaign form letters. Please submit campaign form letters by the originating organization in batches of between 50 to 500 form letters per PDF or as one form letter with a list of supporters' names compiled into one or more PDFs. This reduces comment processing and posting time.

Confidential Business Information. According to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit via email, postal mail, or hand delivery two well-marked copies: one copy of the document marked confidential including all the information believed to be confidential, and one copy of the document marked "non-confidential" with the information believed to be confidential deleted. Submit these documents via email to *ResDishwasher2016TP0012@ee.doe.gov* or on a CD, if feasible. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

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

process. Interactions with and between members of the public provide a balanced discussion of the issues and assist DOE in the process. Anyone who wishes to be added to the DOE mailing list to receive future notices and information about this process should contact Appliance and Equipment Standards Program staff at (202) 287-1445 or via e-mail at *ApplianceStandardsQuestions@ee.doe.gov*.

Signed in Washington, D.C., on August 6, 2019.



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