[6450-01-P]

DEPARTMENT OF ENERGY

Office of Energy Efficiency and Renewable Energy

[Case No. BC-001]

Notice of Petition for Waiver of Dyson, Inc. from the Department of Energy Battery Chargers Test Procedures and Grant of Interim Waiver

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

ACTION: Notice of petition for waiver and grant of interim waiver, and request for public comment.

SUMMARY: This notice announces receipt of and publishes a petition for waiver from Dyson, Inc. (Dyson) seeking an exemption from specified portions of the U.S. Department of Energy (DOE) test procedure for determining the energy consumption of battery chargers. The waiver request pertains to the battery chargers in Dyson's robotic vacuum cleaner model RB01, marketed as the Dyson 360-Eye (Robot). In its petition, Dyson contends that in order to provide the user with the advanced setting and management features of the Robot, the relevant functionalities and circuitry have to be powered at all times, and consequently, there is no user-controllable switch to disable those non-battery charging functions as the current DOE test procedure contemplates. Consequently, Dyson seeks to use an alternate test procedure to turn off the Non-Battery Charging Functionalities during the charge and maintenance mode test by isolating a terminal of the battery pack using isolating tape. This notice also announces that DOE

has granted Dyson an interim waiver from the DOE battery charger test procedure for its specified robotic vacuum cleaner basic model, subject to use of the alternative test procedure as set forth in this notice. DOE solicits comments, data, and information concerning Dyson's petition and its suggested alternate test procedure.

DATES: DOE will accept comments, data, and information with regard to the Dyson petition until **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: You may submit comments, identified by Case Number BC-001, by any of the following methods:

- Federal eRulemaking Portal: http://www.regulations.gov. Follow the instructions for submitting comments.
- E-mail: AS_Waiver_Requests@ee.doe.gov Include the case number [Case No. BC-001] in the subject line of the message. Submit electronic comments in WordPerfect, Microsoft Word, PDF, or ASCII file format, and avoid the use of special characters or any form of encryption.
- Postal Mail: Mr. Bryan Berringer, U.S. Department of Energy, Building Technologies Office, Mailstop EE-5B, Petition for Waiver Case No. BC-001, 1000 Independence Avenue, SW., Washington, DC 20585-0121. Telephone: (202) 586-0371. 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) 586-6636. If possible, please submit all items on a CD, in which case it is not necessary to include printed copies.

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

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

Mr. Peter Cochran or Mr. Eric Stas, 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) 586-9496 or (202) 586-9507. E-mail: Peter.Cochran@hq.doe.gov or Eric.Stas@hq.doe.gov.

SUPPLEMENTARY INFORMATION:

I. Background and Authority

Title III, Part B[1] of the Energy Policy and Conservation Act of 1975 (EPCA), Public Law 94-163 (42 U.S.C. 6291-6309, as codified) established the Energy Conservation Program for Consumer Products Other Than Automobiles, a program that includes the battery charger-containing robotic vacuums that are the focus of this notice.[2] Part B includes definitions, test procedures, labeling provisions, energy conservation standards, and the authority to require information and reports from manufacturers. Further, Part B authorizes the Secretary of Energy to prescribe test procedures that are reasonably designed to produce results that measure energy efficiency, energy use, or estimated operating costs during a representative average-use cycle, and that are not unduly burdensome to conduct. (42 U.S.C. 6293(b)(3)) The test procedure for battery chargers is contained in Title 10 of the Code of Federal Regulations (CFR) part 430, subpart B, appendix Y, Uniform Test Method for Measuring the Energy Consumption of Battery Chargers.

DOE's regulations set forth at 10 CFR 430.27 contain provisions that allow a person to seek a waiver from the test procedure requirements for a particular basic model of a type of covered consumer product when: (1) the petitioner's basic model for which the petition for waiver was submitted contains one or more design characteristics that prevent testing according to the prescribed test procedure, or (2) the prescribed test procedures may 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(a)(1). A petitioner must include in its petition any alternate test procedures known to the petitioner to evaluate the basic model in a manner representative of its energy consumption. 10 CFR 430.27(b)(1)(iii).

[1] For editorial reasons, upon codification in the U.S. Code, Part B was redesignated as Part A.
[2] All references to EPCA in this document refer to the statute as amended through the Energy Efficiency Improvement Act of 2015 (EEIA), Public Law 114-11 (April 30, 2015).

DOE may grant a 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. As soon thereafter as practicable, DOE will publish in the Federal Register a final rule. 10 CFR 430.27(l).

The waiver process also allows DOE to grant an interim waiver from test procedure requirements to manufacturers that have petitioned DOE for a waiver of such prescribed test procedures if it appears likely that the petition for waiver will be granted and/or if DOE determines that it would be desirable for public policy reasons to grant immediate relief pending a determination on the petition for waiver. 10 CFR 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. Petition for Waiver of Test Procedure and Application for Interim Waiver

On April 7, 2016, Dyson filed a petition for waiver from the DOE test procedure for battery chargers under 10 CFR 430.27 for their robotic vacuum cleaner model RB01, marketed as the Dyson 360-Eye (Robot), which is required to be tested using the DOE battery charger test

procedure at 10 CFR 430.23(aa) and detailed at 10 CFR part 430, subpart B, appendix Y. In its petition, Dyson asks that the requirement contained in the current DOE test procedure for battery chargers provided in 10 CFR part 430, subpart B, appendix Y, section 4.4, Limiting Other Non-Battery-Charger Functions, be waived with regard to testing on the Robot. According to subsection 4.4.b (and a related provision at section 5.6.c.1), any function controlled by the user and not associated with the battery charging process shall be switched off or shall be set to the lowest power-consuming mode.

Dyson asserts that in order to provide the user with the advanced setting and management features of the Robot, the relevant functionalities and circuitry have to be powered at all times. Accordingly, Dyson does not believe it appropriate to make the Non-Battery Charging Functionalities user controllable because they are an integral part of the Robot itself. Therefore, in order to ascertain the true energy consumption characteristics of the battery charger during the test, Dyson seeks permission to switch off the Non-Battery Charging Functionalities by a means that is not controlled by the user.

Dyson also requests an interim waiver from the existing DOE test procedure for immediate relief. As previously noted, an interim waiver may be granted 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. See 10 CFR 430.27(e)(2).

DOE understands that absent an interim waiver, the basic model identified by Dyson in its petition cannot be tested and rated for energy consumption on a basis representative of their

true energy consumption characteristics. DOE has reviewed the alternate procedure and concludes that it will allow for the accurate measurement of the energy use of these products, while alleviating the testing problems associated with Dyson's implementation of battery charger testing for their robotic vacuum cleaner. Consequently, DOE has determined that Dyson's petition for waiver will likely be granted and has decided that it is desirable for public policy reasons to grant Dyson immediate relief pending a determination on the petition for waiver. Dyson requests to use an alternate test procedure that would allow it to turn off the Non-Battery Charging Functionalities during the charge and maintenance mode test under 10 CFR part 430, subpart B, appendix Y, sections 4.4 and 5.6 by isolating a terminal of the battery pack using isolating tape, thereby providing a suitable method for testing these products and for making representations as to their energy efficiency.

III. Summary of Grant of Interim Waiver

For the reasons stated above, DOE has responded positively to Dyson's application for interim waiver from testing for its specified robotic vacuum cleaner basic model through separate correspondence, which includes an Order granting the application for an interim waiver, subject to the certain specifications and conditions. The substance of the Interim Waiver Order is summarized below.

Dyson is required to test and rate the battery charger of the specified robotic vacuum cleaner basic model according to the alternate test procedure as set forth in section IV, "Alternate Test Procedure." Specifically, the interim waiver applies to the following basic model: RB01, marketed as the Dyson 360-Eye (Robot). Dyson is permitted to make representations about the energy use of its battery charger for the robotic vacuum cleaner products for compliance,

marketing, or other purposes only to the extent that such products have been tested in accordance with the provisions set forth in the alternate test procedure and such representations fairly disclose the results of such testing in accordance with 10 CFR 429.39.

DOE makes decisions on waivers and interim waivers for only those models specifically set out in the petition, not future models that may be manufactured by the petitioner. Dyson 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). In addition, DOE notes that granting of an interim waiver or waiver does not release a petitioner from the certification requirements set forth at 10 CFR part 429. See also 10 CFR 430.27(a) and (i).

The interim waiver shall remain in effect consistent with the provisions of 10 CFR 430.27(h) and (l). Furthermore, this interim waiver is conditioned upon the presumed validity of statements, representations, and documents provided by the petitioner. DOE may rescind or modify a waiver or interim waiver at any time upon a determination that the factual basis underlying the petition for waiver or interim waiver is incorrect, or upon a determination that the results from the alternate test procedure are unrepresentative of the basic model's true energy consumption characteristics. See 10 CFR 430.27(k).

IV. Alternate Test Procedure

EPCA requires that manufacturers use DOE test procedures when making representations about the energy consumption and energy consumption costs of products and equipment covered

by the statute. (42 U.S.C. 6293(c); 6314(d)) Consistent representations about the energy efficiency of covered products and equipment are important for consumers evaluating products when making purchasing decisions and for manufacturers to demonstrate compliance with applicable DOE energy conservation standards. Pursuant to its regulations applicable to waivers and interim waivers from applicable test procedures at 10 CFR 430.27 and after considering public comments on the petition, DOE will announce its decision as to an alternate test procedure for Dyson in a subsequent Decision and Order.

During the period of the interim waiver granted in this notice, Dyson shall test the basic model listed in section II according to the test procedure for battery chargers prescribed by DOE at 10 CFR part 430, subpart B, appendix Y, except that under sections 4.4 and 5.6 of appendix Y, Non-Battery Charging Functionalities that cannot be switched off by a user during the charge and maintenance mode test, must be turned off by isolating a terminal of the battery pack using isolating tape.

V. Summary and Request for Comments

Through this notice, DOE announces receipt of Dyson's petition for waiver from the DOE test procedure for battery chargers and announces DOE's decision to grant Dyson an interim waiver from the test procedure for its robotic vacuum cleaner model RB01, marketed as the Dyson 360-Eye (Robot). DOE is publishing Dyson's petition for waiver in its entirety, pursuant to 10 CFR 430.27(b)(1)(iv). The petition contains no confidential information. The petition includes a suggested alternate test procedure to determine the energy consumption of the

battery charger used in Dyson's specified robotic vacuum cleaner. Dyson is required to use this alternate procedure, as specified in section IV of this notice, as a condition of its grant of interim waiver, and after considering public comments on the petition, DOE will announce its decision as to the continued use of this alternate procedure in its subsequent Decision and Order.

DOE solicits comments from interested parties on all aspects of the petition, including the suggested alternate test procedure and calculation methodology. 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 Ms. Ashley Shaw, Assistant General Counsel, Dyson, Inc., 600 West Chicago Avenue, Suite 275, Chicago, IL 60654. All comment submissions must include the agency name and Case Number BC-001 for this proceeding. Submit electronic comments in WordPerfect, Microsoft Word, Portable Document Format (PDF), or text (American Standard Code for Information Interchange (ASCII)) file format and avoid the use of special characters or any form of encryption. Wherever possible, include the electronic signature of the author. DOE does not accept telefacsimiles (faxes).

Pursuant to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt by law from public disclosure should submit two copies to DOE: one copy of the document marked "confidential" with all of the information believed to be confidential included, and one copy of the document marked "non-confidential" with all of the information believed to be confidential deleted. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

Issued in Washington, DC, on August 30, 2016.

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Kathleen B. Hogan
Deputy Assistant Secretary for Energy Efficiency
Energy Efficiency and Renewable Energy

April 7, 2016

APPLICATION OF PETITION OF WAIVER

Dyson, Inc. ("Dyson") hereby respectfully submits this Application for Petition of Waiver jointly with an Application for Interim Waiver, to the Department of Energy ("DOE") with regard to the Dyson robotic vacuum cleaner model RB01, marketed as the Dyson 360-Eye ("Robot").

Requirement to be Waived

This petition asks that the requirement contained in the current DOE test procedure for battery chargers provided in CFR 10 Part 430.23, Appendix Y – "Uniform Test Method for Measuring the Energy Consumption of Battery Chargers," Clause 4.4 (Limiting Other Non-Battery-Charger Functions), be waived with regard to testing on the Robot.

According to Sub-Clause, 4.4.b and the "Charge Mode and Battery Maintenance Mode Test" detailed in Section 5.6, any function controlled by the user and not associated with the battery charging process shall be switched off or shall be set to the lowest power consuming mode.

By virtue of the design characteristics of the Robot, using the prescribed test procedure would cause the machine to be evaluated in a manner not representative of the true energy consumption characteristics of the battery charger because certain functions that affect energy consumption measurements are not controlled by the user and cannot be turned off by the user. However, in order to obtain representative values, these functions should be switched off, and can be by the person performing the test procedure. This petition seeks a waiver of the requirement that these functions must be able to be switched off by the user.

We believe that the aim of the test procedure is to specify a method for quantifying the power consumption of the battery charging function and setting the appropriate test conditions solely by user-controllable means is not a fundamental requirement to achieve that purpose.

Robot Description - Intended Operation and Design Characteristics

The Robot is a robotic vacuum cleaner with integral Li-Ion battery. The battery is contained in a battery pack together with the charging control circuit. The battery pack can be detached by the user, but cannot be charged separately from the machine. The Wi-Fi transceiver can be controlled by the user and can be disabled by the user following the instructions in the operating manual.

The Robot is charged through a cradle powered by a separate, external AC/DC adapter (wall plug type). The charging circuitry is comprised of the external adapter, the cradle, and the battery pack.

The charging control contained in the battery pack is independent from the Robot. Accordingly, it autonomously starts charging the robot when it is in the cradle and turns off charging when the charging process is complete.

The LED-based user interface on the machine enclosure represents the machine's status. It is entirely controlled by the Robot and not by the battery pack circuitry. It can provide a variety of information to the user, including but not limited to, low battery and fault condition alerts.

During the typical operation, the Robot accomplishes its intended functions by powering the motors (vacuuming), the navigation system (sensors), the User Interface, and the connectivity platform, until its control processor detects a low battery state and aims for the cradle.

When the Robot reaches the cradle, the charging function is activated by the battery pack. During charging, the Robot also maintains the User Interface and connectivity platform ("Non-Battery Charging Functionalities").

The battery is fully charged in approximately two (2) hours. At that point, an electronic switch fitted in the battery pack disconnects the battery from the charging line and the battery charging function enters what the test procedure calls "maintenance mode."

The battery pack has a very long shelf life (i.e., the battery would maintain sufficient charge for a long period of time, approximately one year). Therefore, in "maintenance mode," the energy consumption is dedicated only to sustain the Non-Battery Charging Functionalities.

The Non-Battery Charging Functionalities are implemented through a complex control circuitry contained in the Robot architecture and can be summarized as the management of the advanced usage features offered to the user. The user is not only able to clean the house remotely but can do so in the way that best suits his/her habits.

By always having the Non-Battery Charging Functionalities in an active state, while in the cradle, the Robot is able to:

a) Receive remote commands to start a scheduled clean from the Dyson cloud;

b) Receive remote commands to start a live clean, either directly from the App or via the Dyson cloud;

c) Receive software upgrades from the Dyson cloud;

d) Be configured prior to starting a clean routine via the App;

e) Be able to respond in a short time to remote user demand with acknowledgement that a cleaning routine has started (no system boot-up);

f) Send status messages to the App and to the Dyson cloud; and

g) Send data to the Dyson cloud, including usage stats.

The battery pack may come with two different charging controls:

Battery Control 1 – The Non-Battery Charging Functionalities are always powered from the battery terminals. To keep the battery fully charged, the charging function must be periodically re-enabled to top-up the charge. This can be seen in Appendix B.1.

Battery Control 2 – When the Robot is in the cradle, the Non-Battery Charging Functionalities are powered directly from the DC supply at the cradle terminals (i.e., indirectly from the mains). The Robot control shares the same power supply of the battery pack (external adapter + cradle) and draws continuous current from the mains. This can be seen in Appendix B.2.

Battery Control 2 will replace Battery Control 1 by the end of 2016.

Grounds for the Petition

In order to provide the user with the advanced setting and management features of the Robot, the relevant functionalities and circuitry have to be powered at all times. Accordingly, we do not believe it is appropriate to make the Non-Battery Charging Functionalities user controllable because they are an integral part of the Robot itself.

Therefore, in order to ascertain the true energy consumption characteristics of the battery charger during the test, we seek permission to switch off the Non-Battery Charging Functionalities by a means that is not controlled by the user.

Proposal

We are seeking permission to turn off the Non-Battery Charging Functionalities during the charge and maintenance mode test by isolating a terminal of the battery pack using isolating tape. A visual description in Appendix A shows which terminal has to be isolated for testing purposes and how it is to be isolated with the tape. A leaflet or a web-link in the user manual could provide similar information.

Currently, the prescribed test method requires the test technician to go well beyond what the user can access (e.g., disassemble the battery pack for the battery discharge test).

The proposed setting where the Non-Battery Charging Functionalities are turned off does not lead to any alteration of the battery charger circuitry or function because the Robot is operating in parallel to it. It simply interrupts the power supply to the Robot and prevents the Non-Battery Charging Functionalities from drawing current from the battery or mains (see Battery Control 1, Battery Control 2, and Appendix B for this distinction).

The following values are typical:

- Power consumption of the Non-Battery Charging Functionalities is approximately 3.5W (including 0.27W used for the User Interface);
- Power consumption in no-battery mode (wall plug external charger + cradle) is 0.48W.

The graphs in Appendix B show the power consumption of the product in charge and maintenance mode for both the actual operation and the proposed test setting.

If our proposal is accepted, we also recommend that the text of clause 4.4.b be modified as follows:

“b. Any function not associated with the battery charging process (e.g. the answering machine in a cordless telephone charging base) shall be switched off. If it is not possible to switch such functions off, they shall be set to their lowest power-consuming mode during test.

If it is not possible to achieve this condition by user-controlled settings, the condition may be achieved by alternative means, unless those lead to an alteration of the battery charger circuit or function.”

Hardship and Competitive Disadvantage
In absence of a favorable determination, the Robot design would have to be modified in order to add a switch that would implement the same isolation obtained by the isolating tape.

The cost in addition to the current bill of materials would be around 0.3 USD, but the real burden is that this switch would have to be added only to enable the measurement of the true energy consumption and would not bring any real benefit for the user.
Indeed, as prescribed by the test procedure, if the switch is made accessible to users, it could result in inadvertent operations. The reliability of the Robot might be affected, including, but not limited to:

- Preventing the Robot from being controlled remotely as intended;
- Random malfunction and bad user experience; and
- Abrupt abortion of software upgrades with the typical consequences (i.e., software corruption).

The actual cost cannot be easily quantified in advance, but would disparage the Dyson brand.

Likely Success of the Petition
Our proposal is in compliance with the test method's intent of measuring the energy efficiency parameters of battery chargers, as it ensures that such energy consumption is still measured. It does not add unnecessary burden to the work of the test technician when applying the test procedure. It is also a proposal that would benefit other manufacturers of consumer products employing advanced connectivity features by providing more flexibility at evaluating compliance with the relevant energy metrics.

Appendix A – Access to the battery terminal

See the following website for Appendix A pictures:
http://www.regulations.gov/#!docketDetail;D=EERE-2016-BT-WAV-0034

Appendix B – Power consumption graphs

B.1a)
Battery Control 1 - Robot control powered from the battery
The battery charger periodically refills the energy used by the non-charging functionalities (red trace). By isolating the terminal only the power drawn by the battery is accounted (blue trace).

See the following website for Appendix B.1a graphs:
http://www.regulations.gov/#!docketDetail;D=EERE-2016-BT-WAV-0034

B.1b)
Battery Control 1 – Circuit diagram

See the following website for Appendix B.1b graphs:
http://www.regulations.gov/#!docketDetail;D=EERE-2016-BT-WAV-0034

B.2a)
Battery Control 2 - Robot control powered from the mains
The battery charger provides energy in parallel both to the battery and to the non-charging functionalities (red trace). By isolating the terminal only the power drawn by the battery is accounted (blue trace).

See the following website for Appendix B.2a graphs:
http://www.regulations.gov/#!docketDetail;D=EERE-2016-BT-WAV-0034

B.2b)
Battery Control 2 – Circuit diagram

See the following website for Appendix B.2b graphs:
http://www.regulations.gov/#!docketDetail;D=EERE-2016-BT-WAV-0034

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