[6450-01-P]

DEPARTMENT OF ENERGY

Office of Energy Efficiency and Renewable Energy

[Case No. RF-038]

Petition for Waiver of Felix Storch, Inc. (FSI) from the Department of Energy Residential Refrigerator and Refrigerator-Freezer Test Procedure and Grant of Interim Waiver

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

ACTION: Notice of Petition for Waiver, Notice of Granting Application for Interim Waiver, and Request for Public Comments.

SUMMARY: This notice announces receipt of a petition for waiver from Felix Storch, Inc. (FSI) seeking an exemption from specified portions of the U.S. Department of Energy (DOE) test procedure for determining the energy consumption of certain electric refrigerators and refrigerator-freezers. FSI asks that it be permitted to use an alternate test procedure to account for the energy consumption of its specific models of its Keg Beer Coolers, Assisted Living Refrigerator-freezers and Ultra-Compact Hotel Refrigerators in place of the currently applicable DOE test procedure. DOE solicits comments, data, and information concerning FSI's petition and the suggested alternate test procedure. Today's notice also declines to grant FSI with an interim waiver from the

electric refrigerator-freezers test procedure, for the reasons described in this notice. The waiver request pertains to the basic models set forth in FSI's petition.

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

ADDRESSES: You may submit comments, identified by case number "RF-038," 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. RF-038] in the subject line of the message.
- Mail: Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Office, Mailstop EE-5B/1000 Independence Avenue, SW, Washington, DC 20585-0121. Telephone: (202) 586-2945. Please submit one signed original paper copy.
- Hand Delivery/Courier: Ms. Brenda Edwards, U.S. Department of Energy, Building Technologies Program, 950 L'Enfant Plaza SW, Suite 600, Washington, DC 20024. Please submit one signed original paper copy.

Docket: For access to the docket to review the background documents relevant to this matter, you may visit the U.S. Department of Energy, 950 L'Enfant Plaza SW,

Washington, DC, 20024; (202) 586-2945, between 9:00 a.m. and 4:00 p.m., Monday through Friday, except Federal holidays. Available documents include the following items: (1) this notice; (2) public comments received; (3) the petition for waiver and application for interim waiver; and (4) prior DOE rulemakings regarding similar refrigerator-freezers. Please call Ms. Brenda Edwards at the above telephone number for additional information.

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

Mr. Michael Kido, U.S. Department of Energy, Office of the General Counsel, Mail Stop GC-71, Forrestal Building, 1000 Independence Avenue, SW., Washington, DC 20585-0103. Telephone: (202) 586-8145. E-mail: Michael.Kido@hq.doe.gov.

SUPPLEMENTARY INFORMATION:

I. Background and Authority

Title III, Part B of the Energy Policy and Conservation Act of 1975 (EPCA), Pub. L. 94-163 (42 U.S.C. 6291-6309, as codified, established the Energy Conservation Program for Consumer Products Other Than Automobiles, a program covering most major household appliances, which includes the electric refrigerators and refrigerator-

freezers that are the focus of this notice.[1] 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 the energy efficiency, energy use, or estimated annual operating costs of a covered product, and that are not unduly burdensome to conduct. (42 U.S.C. 6293(b)(3)) The currently applicable test procedure for electric refrigerators and electric refrigerator-freezers is contained in 10 CFR part 430, subpart B, appendix A1. The test procedure that will be required for certifying that products comply with Federal standards beginning on September 15, 2014 is contained in in 10 CFR part 430, subpart B, appendix A.

The regulations set forth in 10 CFR part 430.27 contain provisions that enable a person to seek a waiver from the test procedure requirements for covered products. The Assistant Secretary for Energy Efficiency and Renewable Energy (the Assistant Secretary) will grant a waiver if it is determined that the basic model for which the petition for waiver was submitted contains one or more design characteristics that prevents testing of the basic model according to the prescribed test procedures, or if 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(l). Petitioners must include in their petition any alternate test procedures known to the petitioner to evaluate the basic model in a manner representative of its energy consumption. The Assistant Secretary may grant the waiver

[1] For editorial reasons, upon codification in the U.S. Code, Part B was re-designated Part A.

subject to conditions, including adherence to alternate test procedures. 10 CFR 430.27(l). Waivers remain in effect pursuant to the provisions of 10 CFR 430.27(m).

The waiver process also allows the Assistant Secretary to grant an interim waiver from test procedure requirements to manufacturers that have petitioned DOE for a waiver of such prescribed test procedures. 10 CFR 430.27(g). An interim waiver remains in effect for 180 days or until DOE issues its determination on the petition for waiver, whichever occurs earlier. DOE may extend an interim waiver for an additional 180 days. 10 CFR 430.27(h).

II. Petition for Waiver of Test Procedure

On December 12 and 17, 2013, FSI submitted a petition for waiver from the test procedure applicable to residential electric refrigerators and refrigerator-freezers set forth in 10 CFR part 430, subpart B, appendices A and A1. In its petition, FSI asserts that its products could not be tested and rated for energy consumption on a basis representative of their true energy consumption characteristics. The DOE test procedure for residential refrigeration (both the procedure that is required currently and the procedure that will be required beginning on September 15, 2014) require testing products at an ambient temperature of 90ºF. DOE selected that temperature to simulate the effects of door openings and closings, which are not performed during the testing. See 10 CFR §430.23(a)(10) (The regulation explains, "[t]he intent of the energy test procedure is to simulate typical room conditions (approximately 70°F (21°C)) with door openings, by testing at 90°F (32.2°C) without door openings."). FSI contends that the products

addressed by its waiver petition will be sold for uses where door openings and closings are highly infrequent. As a result, in its view, testing these products in accordance with the DOE test procedure conditions would result in measurements of energy use that are unrepresentative of the actual energy use of these products under their conditions of expected use by consumers.

As an alternative, FSI submitted to DOE an alternate test procedure to account for the energy consumption of its Keg Beer Coolers, Assisted Living Refrigerator-freezers and Ultra-Compact Hotel Refrigerators. That procedure would test these units at 70°F or 72°F over a 24-hour period instead of the required 90°F ambient temperature condition. FSI believes its alternate test procedure will allow for the accurate measurement of the energy use of these products as required by the current DOE test procedure.

FSI also requests an interim waiver from the existing DOE test procedure for the models listed in its December 12, 2013 petition. An interim waiver may be granted if it is determined that the applicant will experience economic hardship if the application for interim waiver is denied, if it appears likely that the petition for waiver will be granted, and/or the Assistant Secretary 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(g).

DOE has determined that FSI's application for interim waiver does not provide sufficient market, equipment price, shipments and other manufacturer impact information

to permit DOE to evaluate the economic hardship FSI might experience absent a favorable determination on its application for interim waiver. DOE understands, based upon FSI's petition, that absent an interim waiver, FSI's products could not be tested and rated for energy consumption on a basis representative of their true energy consumption characteristics. However, DOE has found that FSI's petition provides insufficient information for DOE to determine whether the alternative test procedure that FSI proposes to use is likely to provide a measurement of the energy use of these products that is representative of their operation under conditions of expected consumer use. Since DOE has found it unlikely that FSI's waiver petition will be granted in its current form and has determined that it is not desirable for public policy reasons to grant FSI immediate relief, DOE is declining to grant an interim waiver and is seeking additional information on the underlying basis for FSI's proposed alternative.

DOE notes that the existing test procedures, as well as recent test procedure waivers, contain a method for addressing certain types of products for which less frequent door openings occur. Specifically, the test procedure for residential freezers applies an adjustment factor to account for the relatively fewer expected door openings of upright and chest freezers, each of which has a corresponding adjustment factor for the overall energy use. (See appendix B to subpart B of 10 CFR part 430, section 5.2.1.) Further, DOE has also granted a test procedure waiver for a combination wine cooler-refrigerator on the basis of the manufacturer's claim that the product would be subjected to fewer door openings in typical use, which used the same adjustment factor as is applied to

upright freezers. 78 FR 35894 (Sept. 17, 2013). DOE also requests comment on whether such an approach would be more appropriate for testing these models.

For the reasons stated above, before DOE will authorize the use of an alternative test procedure for testing of the specific models listed in the waiver petitions, DOE is seeking comment from interested stakeholders on whether FSI's proposed test is likely to be representative of the energy use of the products that are the subjects of the waiver petition or whether another alternative may be more appropriate.

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. FSI may submit a new or amended petition for waiver and request for grant of interim waiver, as appropriate, for additional models of refrigerator-freezers for which it seeks a waiver from the DOE test procedure. 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.

III. Summary and Request for Comments

Through today's notice, DOE announces receipt of FSI's December 12, 2013 and December 17, 2013 petitions for waiver from the specified portions of the test procedure applicable to FSI's line of Keg Beer Coolers, Assisted Living Refrigerator-freezers and Ultra-Compact Hotel Refrigerators and declines to grant FSI an interim waiver from those same portions of the test procedure for the models specified in its December 12,

2013 request for interim waiver. The petition includes a suggested alternate test procedure to determine the energy consumption of FSI's specified refrigerator-freezers. DOE may consider including this alternate procedure in a subsequent Decision and Order. However, at this time, DOE cannot establish whether the alternative procedure proposed by FSI is an appropriate means for measuring the energy use of these products based solely on the information provided in the waiver petition.

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: Paul Storch, President, Summit Appliance Div., Felix Storch, Inc., 770 Garrison Ave., Bronx, NY 10474. All submissions received must include the agency name and case number 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).

Issued in Washington, DC, on March 11, 2014.

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

December 12, 2013

Building Technologies Program
U.S. Department of Energy
Test Procedure Waiver
1000 Independence Ave., SW
Mailstop EE-2J
Washington, DC 20585-0121

RE: ***Petition for Waiver of Test Procedures in use currently (*****10 CFR §430, subpart B, appendix A1) and** ***proposed for September 15, 2014 (10 CFR §430, Subpart B, Appendix A) pursuant to 10 CFR. § 430.27(a)(1) for Summit brand appliances as follows:***

- Keg Beer Coolers (Models SBC590, SBC590OS, and SBC635M)
- Assisted Living Refrigerator-freezers (Models ALBF44, ALBF68)
- Hotel Refrigerators (Models HTL2 and HTL3)

INTRODUCTION

The Department of Energy ("DOE") provides a waiver process for refrigeration products when "the prescribed [10 CFR §430, Subpart B, Appendix A1 currently and the proposed 10 CFR §430, Subpart B, Appendix A] test procedures may evaluate [a product] . . . in a manner so unrepresentative of its true energy consumption characteristics . . . as to provide materially inaccurate comparative data." 10 C.F.R. §430.27. This petition seeks such a waiver for the above-referenced products.

Felix Storch, Inc. ("FSI") is a small business engaged in importing, manufacturing, and distributing appliances to niche markets in the household, commercial, hospitality, institutional, and medical community, as well as distributing household cooking and laundry appliances. Located in the South Bronx, New York, FSI employs approximately 150 individuals engaged in manufacturing, material handling, trucking, engineering, marketing, sales, shipping, clerical services, and customer service. FSI, under the Summit brand name, imports refrigeration products from a number of factories in Europe, Mexico and Asia, as well as manufactures a number of products in New York. A significant part of FSI's business is value-added manufacturing conducted by FSI in its Bronx facility. Value-added manufacturing is the process of adding or modifying components or finishes to existing products in order to adapt these appliances for sale to special markets where few or no suitable products exist. The above-referenced models are all either built or modified in our Bronx facility.

DOE's test procedures are not appropriate for the above-referenced models because they fail to accurately reflect the actual energy consumption of the products during normal use. DOE test procedures for residential refrigeration (both the procedures in effect currently and the proposed procedures for 2014) require testing products at an ambient temperature of 90ºF. DOE selected that temperature (as opposed to a more

normal 70ºF ambient) to simulate the effects of door openings and closings; such actions are not performed during the testing. *See* 10 CFR §430.23(a)(10) (The regulation explains, "[t]he intent of the energy test procedure is to simulate typical room conditions (approximately 70°F (21°C)) with door openings, by testing at 90°F (32.2°C) without door openings.").[2] However, the above-listed FSI products will be sold for uses where door openings and closings are highly infrequent.[3] All these products will consume far less energy during actual use than is measured by the existing and proposed testing procedures.

FSI seeks a waiver for the above-references products because:

1) Test procedures do not provide a fair and accurate representation of actual energy use;
2) The market size for each of these products is quite small;
3) The economic burden of complying with DOE standards in effect today, and the proposed standards for 2014, would place an undue economic burden on FSI;
4) There is an easily substituted alternate test procedure for these models;
5) Withdrawing these products from the marketplace would greatly limit consumer choice, adversely impact small business and, in some cases, result in compelling customers to turn to larger or less energy efficient products that increase overall energy consumption.

For these reasons, FSI respectfully requests a waiver, pursuant to 10 C.F.R. §430.27, of the test procedures for residential refrigerators provided in 10 CFR §430, Subpart B, Appendix A.

1. Models for which a waiver is requested.

This waiver request applies to the following models:

- Keg Beer Coolers (Models SBC590, SBC590OS, and SBC635M)
- Assisted Living Refrigerator-freezers (Models ALBF44, ALBF68)
- Hotel Refrigerators (Models HTL2 and HTL3)

All of these models are intended for uses distinct from the typical household use whereby the doors on these products are seldom opened and closed.

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[2] *See* 10 CFR 10 CFR §430.23(a)(10) (identifying 70°F as being representative of typical room temperature).

[3] It is important to note that the overwhelming majority of compact appliances sold today fall into the categories of dormitory type or office type refrigerator-freezers. FSI could not find statistics on door openings for these products, but since these types of units would be shared by multiple users, it is logical to assume their use would be similar to conventional refrigerators, as opposed to the special use models in this waiver petition.

2. Manufacturers of other basic models marketed in the United States are known by FSI to incorporate similar design characteristics.

Manufacturers of other basic models marketed in the United States and known to FSI that incorporate similar design characteristics are included in Attachment A.

3. Alternate test procedures are known to FSI to evaluate accurately evaluate energy consumption of the listed basic models.

FSI has extensive data that demonstrates that a single change to the test procedure will result in measuring energy consumption in a manner far more representative of actual use.

Testing the basic models listed in this petition at an ambient temperature of 70°F or 72°F, rather than 90°F will measure energy consumption in a manner significantly more representative of actual use than using the DOE prescribed test procedures, both under current standards and those proposed for implementation on September 15, 2014.

BACKGROUND

DOE acknowledges in 10 CFR §430.23(a)(10) that "[t]he intent of the energy test procedure is to simulate typical room conditions (approximately 70°F (21°C)) with door openings, by testing at 90°F (32.2°C) without door openings."

DOE uses 90ºF as a surrogate for running tests at typical ambient temperature to simulate the impact of opening and closing refrigerator and freezer doors. This standard is incorporated into the AHAM test procedures used by DOE in both the current standards and the upcoming 2014 standards. This temperature selection is at least 30 years old and is referenced in ANSI-AHAM HRF-1 (1979).[4]

Several studies have attempted to validate this information. For example, one study showed that household refrigerators-freezers had a median of 48 fresh-food door openings and 10 freezer door openings per 24 hours.[5] A study based on this number of door openings concluded that 90ºF overstated energy consumption by 8.3% to 15.9%.[6]

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[4] *American National Standard on Household Refrigerators and Household Freezers*, ANSI/AHAM HRF-1-1979 at 51-52, *available at*: https://law.resource.org/pub/us/cfr/ibr/001/aham.HRF-1.1979.pdf.

[5] *See* Danny S. Parker & Ted C. Stedman, *Measured Electricity Savings of Refrigerator Replacement: Case Study and Analysis*, Florida Solar Energy Center FSEC-PF-239-92 (1992) (citing Chang, Y.L., and R.A. Grot. 1979. *Field performance of residential refrigerators and combination refrigerator-freezers*. NBSIR 79-1781).

[6] James Y. Kao & George E. Kelly, *Factors Affecting the Energy Consumption of Two Refrigerator-Freezers*, SA-96-7-1 at 9 *available at:* http://fire.nist.gov/bfrlpubs/build96/PDF/b96070.pdf.

Several other studies corroborate these results.[7] For example, a study by the Florida Solar Energy Center measured door openings and closings in two person households and found an average of 42 openings per day. [8]

A National Institute of Standards ("NIST") study, commissioned by DOE, also demonstrated that when testing is performed at 90ºF, as little as a 2 degree difference in ambient temperature can result in a dramatic difference in measured energy consumption. [9] Alan Meier, an associate American Society of Heating, Refrigerating and Air-Conditioning Engineers ("ASHRAE") member, conducted a more exhaustive study of this correlation and found that for two groups of refrigerators extensively monitored, actual energy use averaged 13% and 15% less than the results from the yellow Energy Guide (which is based on AHAM procedures).[10] Mr. Meier reported that families typically open and close the doors of their refrigerators an average of 50 times daily. The study observed, "[r]elatively modest ambient temperature variations led to 50% changes in energy use."

Another study by P.K. Bansal, also an ASHRAE member, states that,

> Elevated ambient temperatures used in most test procedures crudely simulate the heat loads from door openings. . . . This process fails to produce satisfactory results that could be representative of an in-situ real world refrigerator performance [11]

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[7] *See e.g.*, NIST Study (citing Alan Meier and Richard Jansky, *Field Performance of Residential Refrigerators: A Comparison with the Laboratory Test*, LBL-31795 UC 150 (May 1991) *available at*: http://www.osti.gov/scitech/servlets/purl/6142295; Meier, A., et al. 1993; The New York refrigerator monitoring project: final report. Report No. LBL-33708. Berkeley, California: Lawrence Berkeley Laboratory; KEMA-XENERGY, Inc., *Final report measurement and evaluation study of 2002 statewide residential appliance recycling program*, 8-1 – 8- 8 (2004); Wong, M.T., W.R. Jones, B.T. Howell, and D.L. Long. 1995. Energy consumption testing of innovative refrigerator-freezer. *ASHRAE Transactions* 101(2).)

[8] Danny S. Parker & Ted C. Stedman, *Measured Electricity Savings of Refrigerator Replacement: Case Study and Analysis*, Florida Solar Energy Center FSEC-PF-239-92 (1992).

[9] David A. Yashar, *Repeatability of Energy Consumption Test Results for Compact Refrigerators*, U.S. Dept. of Commerce, Technology Administration National Institute of Standards and Technology at 7-8, 14 (September 2002), *available at*: http://fire.nist.gov/bfrlpubs/build00/PDF/b00055.pdf.

[10] Alan K. Meier, *Field performance of residential refrigerators*, ASHRAE Journal 36-40 (August 1999).

[11] P.K. Bansal, *Studies on algorithm development for energy performance testing: study 2 – study of algorithms for domestic refrigeration appliances*, APEC#201-RE-01.11 at 19 (2001).

Even a 2010 study by the Energy Analysis Department of the Lawrence Berkeley Laboratory, CA, supported by DOE, stated, "[i]n many cases the test procedures do not reflect field usage[.]" [12]

These studies provide clear evidence that when refrigerator doors are opened infrequently, the AHAM procedures using 90ºF as the ambient temperature will overstate energy consumption.

Most of these studies were done on typical household refrigerator-freezers. FSI found no comparable data for compact refrigerators or, more specifically, on any of the type of products for which a waiver is sought in this petition. Indeed, DOE's own Technical Support Document, acknowledged that:

> "DOE found no data on the typical field energy consumption of compact refrigeration products. It therefore assumed that the average field energy use of compact refrigerators and freezers of a given size the same as the maximum energy use allowed by the DOE standard as measured in the DOE test procedure. In effect, DOE assumed that variation in the field energy use of compact appliances is a function solely of volume."[13]

The approximation ignores the significantly important variable of the number of door openings and closings which greatly differs between a full size refrigerator used by a family and a specialty compact refrigerator used in a secondary application.

FSI performed tests on four representative models of refrigerators and beer dispensers., running tests at average 72ºF (room) temperature and at 90ºF. For one set of tests FSI opened and closed the doors of each unit six times per test, which exceeds the frequency of typical door openings and closings for these models. The second set of tests was conducted with doors remaining closed throughout the test. These tests consistently showed that all units at average 72ºF (room temperature) used over 40% less energy than when run at 90ºF. The tests with doors closed had a weighted average of 48% lower energy consumption than at 90ºF, and tests with door openings had a weighted average of 46% lower energy consumption. Door openings consistent with actual use, or tests without door openings, did not change the overall results or the conclusions.

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[12] Jim Lutz, et al. *How to make appliance standards work: improving the energy and water efficiency test procedures,* Ernest Orlando Lawrence Berkeley National Laboratory for Assistant Secretary for Energy Efficiency and Renewable Energy, Office of Building Technology, State and Community Programs, of the U.S. Department of Energy, LBNL#4961E at 1 (2010).

[13] U.S. Dept. of Energy, *Preliminary Technical Support Document: Energy Efficiency Program for Consumer Products: Refrigerators, Refrigerator-Freezers, and Freezers* at 7-38 (Nov. 2009), *available at:* http://www1.eere.energy.gov/buildings/appliance_standards/residential/pdfs/ref_frz_prenopr_prelim_tsd.pdf.

A summary of this data is presented in the following tables.

Table 1

Tests with appropriate door openings and closings

Type	No. tests	Energy use at 90°F	Energy use at ambient With doors opened/closed	Percent decrease
Beer Dispenser	2	1.16 kWh/day	0.68 kWh/day	41%
Hotel Refrigerator	4	1.04 kWh/day	0.59 kWh/day	43%
Assisted Living Unit 1	3	0.91 kWh/day	0.51 kWh/day	44%
Assisted Living Unit 2	6	1.10 kWh/day	0.55 kWh/day	50%

Table 2
Tests with doors closed

Type	No. tests	Energy use at 90°F kWh/day	Energy use at ambient (no door openings)	Percent decrease
Beer Dispenser	6	1.16 kWh/day	0.65 kWh/day	44%
Hotel Refrigerator	5	1.04 kWh/day	0.55 kWh/day	47%
Assisted Living Unit 1	6	0.91 kWh/day	0.49 kWh/day	46%
Assisted Living Unit 2	8	1.10 kWh/day	0.52 kWh/day	53%

DISCUSSION OF DOOR OPENINGS AND CLOSINGS FOR THE MODELS IN THIS WAIVER PETITION

The units in this waiver application do not conform to the same usage as typical household full-size refrigerators: the doors on all of these basic units are opened and closed significantly less frequently than typical household refrigeration equipment. The units in this waiver petition also differ from the majority of compact refrigerator-freezers sold for dormitory or office use, which are typically shared by a number of users.

1. **Keg Beer Coolers [Models SBC590, SBC590OS, and SBC635M]**

Beer coolers, by their nature, have their doors opened and closed **only** when a keg needs to be changed. Depending on usage, this may be once weekly, once monthly, or even less frequently. Beer in kegs is always provided in a chilled state, so in essence the beer cooler is not working to bring contents to the design temperature, but is only maintaining steady state conditions. The products in this waiver petition do not have

shelves and are designed to store beer kegs only. Furthermore, use and care guides normally advise to turn off the electricity to the beer cooler while changing the keg, for both safety and energy conservation.

2. Assisted Living Refrigerators [Models ALBF44, ALBF68]

Refrigerators whose primary market is assisted living centers generally do not serve as a primary refrigerator.[14] These centers typically provide residents with three full meals a day, along with snacks during morning, afternoon, and evening activities. As such, these units serve as secondary storage that is opened and closed less frequently than primary household refrigerators. A limited survey of residents in two of these facilities done by FSI employees showed that fresh food doors were opened an average of 4 times daily, and freezer doors less than once. The refrigerators sold by FSI that are used in these assisted living studio apartments also differ from typical household or dormitory type refrigerators in design. They are usually frost free or partial automatic defrost for the convenience of an elderly population (compared to typical "dormitory" refrigerators that are usually manual defrost). Moreover, they are usually only 4 to 6 cubic feet compared to the 15 to 25 cubic feet typically found in homes or apartments.

3. Ultra-Compact Hotel Refrigerators [Models HTL2 and HTL3]

FSI's proprietary ultra-compact refrigerators (with compressors) for hotel rooms are planned for introduction in early 2014 and are designed for guest convenience.[15] These refrigerators are priced at a premium, very compact, and normally would be marketed only to upscale hotels. FSI estimates that guests will open and close the door to these units infrequently, if at all, since hotel rooms are generally occupied primarily during sleeping hours and meals are ordinarily eaten outside the room, or delivered by room service.[16] In addition, these units will not be in use when the hotel rooms are vacant.

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[14] Assisted living facilities generally include meals as a standard feature. *See e.g.* Sunrise Senior Living, Assisted Living *available at*: http://www.sunriseseniorliving.com/care-and-services/assisted-living.aspx ("While services and amenities may very by location, Sunrise assisted senior living communities generally provide . . . [t]hree delicious, well-balanced meals served daily[.]"); Friendship Assisted Living, Amenities *available at*: http://friendship.us/assisted-living/amenities-2/ ("Restaurant-style dining is available for three meals everyday[.]"); HelpGuide.org, Assisted Living Facilities, *available at*: http://www.helpguide.org/elder/assisted_living_facilities.htm (showing that assisted living facilities typically provide three meals a day).

[15] Full size refrigerators used in hotel suites with kitchenettes or extended stay hotels are not part of the waiver application.

[16] *See* American Hotel & Lodging Association, Eco-Friendly Case Studies, *available at*: http://www.ahla.com/Green.aspx?id=21756 (The Radisson Hotel Cleveland decided to unplug hotel room mini-refrigerators because "a majority of hotel guests did not use them during their stay.").

As demonstrated above, testing the basic models in this waiver petition under the current and proposed test procedures would produce results that are "unrepresentative of its true energy consumption characteristics . . . as to provide materially inaccurate comparative data." 10 C.F.R. §430.27.

Based on the information presented, FSI proposes the following modifications be made to the DOE test procedures for the models named in this petition:

1. Beer dispensers (Models SBC590, SBC590OS and SBC635M); be tested at an ambient temperature of 70°F (per DOE's estimate of approximately 70° F as typical room-temperature) with the doors closed;
2. Hotel and assisting living refrigerators (Models ALBF44, ALBF68, ALBF68, HTL2 and HTL3) be tested at 72°F to account for the very small number of daily door openings (where 2°F is 10% of the difference between 70°F and 90°F and door openings of these products groups are no more than 10% of the typical household refrigerators);
3. The units be tested for 24 continuous hours after stabilization to account for any timers used in the assisted living and hotel refrigerators; and
4. All other test procedures are conducted in accordance with AHAM and DOE test procedures for residential refrigerators.

ADDITIONAL REASONS IN SUPPORT OF GRANTING THIS WAIVER

FSI targets niche markets with many models, including those referenced herein, where the overall sales volume is too limited to appeal to manufacturers driven by mass production and economies of scale. In some cases, not allowing products that address certain size or use needs to market will have the unintended consequences of substantially reducing consumer choice and driving energy consumption up through a switch to larger models.

For example, in the case of the assisted living markets, withdrawing specialty products from this small, niche market may force facilities to purchase larger refrigerators than necessary, increasing overall energy usage. The convenience and accessibility of these compact products is often more appropriate for assisted living residents. If suitably sized products are not available, facilities might be forced to remodel a kitchenette when a refrigerator needs replacing.

In the case of the hotel industry, hotels (excluding extended stay hotels or suite type hotels) often use refrigerators that are driven by an absorption cooling system or by a thermoelectric cooling system (also called heat pipe systems). These cooling systems use significantly more energy than compressor systems, but are chosen by hotels for their low noise levels. It is important to note that these basic units may not be covered products for DOE because their design does not always allow them to reach the 39ºF threshold and, therefore, may not be considered a refrigerator per the statutory definition. [*See* 10 C.F.C. §430.2 (defining an electric refrigerator as "a cabinet designed for the refrigerated storage of food, designed to be capable of achieving storage temperatures

above 32°F (0°C) and below 39°F (3.9°C), and having a source of refrigeration requiring single phase, alternating current electric energy input only.")]. Consequently, by excluding FSI compressor models from competing in this market, hotels will use models with absorption or thermoelectric systems which use substantially more energy than the excluded products.

ECONOMIC BURDEN OF THE REGULATIONS ON SMALL BUSINESS IN GENERAL AND FSI IN PARTICULAR

Failure to grant these basic models waivers from test procedures would have severe economic consequences for FSI.

Very large, multi-national corporations dominate the appliance market, led by Whirlpool and General Electric, whose sales are in the billions of dollars. Foreign companies with appliance sales in the billions of dollars and with a large U.S. presence include Electrolux (Frigidaire), LG, Samsung, Daiwoo, Bosch, Liebherr, Miele, AGA-Marvel, Bertazoni, Smeg, Haier, and Midea. FSI cannot compete with these companies' mass markets, with huge economies of scale on production, and distribution and insignificant compliance testing costs. FSI predominantly markets specialty appliances that respond to niche market demands and customer choice.

In response to DOE 2014 test procedures, FSI is working very hard to modify the vast majority of its residential refrigerator and freezer product line to comply with the new procedures. But in a number of niche markets with very small sales, the feasibility and costs of compliance are highly disproportionate for FSI to make a business case and will not result in energy savings. This results in an undue burden on FSI, for which these niche products form the nucleus of FSI's manufacturing operations and are the driver of job creation in disadvantaged economic development areas. Unlike the large companies mentioned above who can spread the cost of meeting current DOE and upcoming DOE 2014 standards and, in particular, test procedures over a base of millions, hundreds of thousands, or tens of thousands of units, a small business like FSI does not have this option.

DOE has acknowledged the difficulties faced by both small manufacturers and the compact refrigeration industry dealing with standards. FSI falls into both categories and 90% of FSI's refrigeration business is restricted to compact classes. DOE reports that compact appliances only account for 2.5% of total energy consumed by all refrigeration products.[17] FSI's assumption is that at least 75% of that small number is consumed by college dormitory/office type products, meaning that less than 1% of total refrigeration energy use is consumed by "specialty" compact appliances, such as those listed in this petition. FSI's market share even in these small niche markets is quite limited. The appliances in this waiver application are a negligible part of that tiny subset and any energy consumption impacts from this waiver are highly de minimis at most. DOE recognizes the limited options available to compact appliance manufacturers, "[b]ecause

[17] *See* Federal Register Vol. 62 No. 81, Page 23111, April 28, 1997.

of small production volumes, the impact of new standards on these manufacturers is relatively severe."[18] This is especially true ahead of DOE 2014 requirements, which mandate a 20% reduction of usage and few affordable alternatives for reducing energy consumption in niche appliances that meet consumer demand.

CONCLUSIONS

The waiver process clearly is intended for situations where test procedures do not provide an accurate representation of actual energy consumption. FSI has demonstrated that the test procedures specified by DOE do not provide representative measure of the basic models in this waiver application, whose doors are opened and closed significantly less than typical household use.

FSI has demonstrated that:

- The use of 90°F is designed to simulate an average of 40 to 50 door openings per day and, even at that level, may overstate energy usage;
- The models listed in this waiver application have their doors opened and closed infrequently, and certainly significantly less than the simulation average;
- An alternate test procedure is readily available consisting of testing the products at 70°F or 72°F, over a 24 hour period, and holding all other test procedures in accordance with AHAM Procedures and 10 CFR §430, Subpart B, Appendix A and Appendix A1.
- Failure to grant this waiver will cause severe economic hardship to FSI, a small business, and likely will cause switch to higher energy consuming replacement products.

FSI respectfully requests DOE waive the test procedures for the products listed in the petition as these "test procedures may evaluate [these product] . . . in a manner so unrepresentative of [their] true energy consumption characteristics . . . as to provide materially inaccurate comparative data." 10 C.F.R. §430.27. All of these basic units have materially different uses than the average products subject to the test procedures. The proposed alternative procedures will provide an accurate representation of actual energy use. For these reasons, FSI respectfully requests that DOE substitute our proposed test procedures and waive the test procedures at 10 CFR §430, Subpart B, Appendix A for FSI's beer coolers, assisted living refrigerator-freezers and hotel refrigerators.

Respectfully submitted,
Paul Storch, President
Summit Appliance Div. Felix Storch, Inc.
770 Garrison Ave. Bronx, NY 10474 USA
PH. 718-893-3900
FAX: 718-842-3093

[18] *Id.*

ATTACHMENT A

Companies with Products Similar to FSI

Automatic defrost or frost free beer coolers (excluding beer coolers that convert into refrigerators)	Refrigerators designed specifically for hotels	4 to 6 c.f. frost-free refrigerators
Nostalgia Products Group LLC 1471 Partnership Dr Green Bay, WI 54304-5685	**Minibar North America** 7340 Westmore Road Rockville, MD 20850	**Avanti Products** 10880 NW 30th Street Miami, FL 33172
Sears 5333 Beverly Road Hoffman Estates, IL 60192	**Dometic Corporation** 13128 State Rt 226 Big Prairie, OH 44611	**Absocold Corporation**. 1122 NW T Street Richmond, IN 47374
Avanti Products 10880 NW 30th Street Miami, FL 33172		
Fisher & Paykel Appliance USA Holdings Inc. 5900 Skylab Rd Huntington Beach, CA, 92647 USA		

December 12, 2013

Dr. David Danielson
Assistant Secretary
Energy Efficiency and Renewable Energy
U.S. Department of Energy
1000 Independence Ave., SW
Washington, DC 20585

RE: Application for Interim Waiver pursuant to 10 C.F.R. § 431.401 for basic Summit models:

- Keg Beer Coolers (Models SBC590, SBC590OS, and SBC635M)
- Assisted Living Refrigerator-freezers (Models ALBF44, ALBF68)
- Hotel Refrigerators (Models HTL2 and HTL3)

Felix Storch, Inc. (FSI) through this Application for Interim Waiver will demonstrate likely success of the petition for waiver and address what economic hardship and/or competitive disadvantage is likely to result, absent a favorable determination on the Application for Interim Waiver.

This application for interim waiver applies to the following models:

- Keg Beer Coolers (Models SBC590, SBC590OS, and SBC635M)
- Assisted Living Refrigerator-freezers (Models ALBF44, ALBF68)
- Hotel Refrigerators (Models HTL2 and HTL3)

Jointly, these models are referred to throughout as 'refrigerators'. Further information to support this application is contained in the Petition for Waiver filed simultaneously to this application.

Confidential Business information:

Felix Storch, Inc. is not asking for any part of this interim waiver request to be redacted.

Likelihood of Success on the Merits

FSI markets a wide range of refrigeration equipment for sale into specialty and niche markets. These refrigerators need to comply with energy efficiency standards issued and enforced by the Department of Energy (DOE). DOE relies on a single test procedure for all residential refrigerators and freezers. While the test procedure will change slightly on Sept. 15, 2014, the basic method of conducting the test will remain unchanged. FSI can conclusively demonstrate that for the specific products in this waiver petition, both test procedures are "so unrepresentative of its true energy consumption characteristics . . . as

to provide materially inaccurate comparative data." *See* 10 CFR §430, subpart B, appendix A1, and 10 CFR §430, subpart B, appendix A.

These test procedures will result in reported energy usage that is substantially higher than actual energy consumption and fail to represent real world operating conditions. As such, we believe that it is highly likely that we will succeed on the merits of the waiver petition. The products listed above meet DOE's intent in creating the waiver petition process and the criteria for establishing test procedures that enable DOE to evaluate products in a manner representative of true energy consumption and provide for accurate comparative data. FSI's approach to developing more representative test procedures is supported throughout the studies cited in the waiver petition and FSI in-situ testing.

Need for an interim waiver

The residential appliance business is a highly competitive business. Companies that specialize in niche products with low annual sales, cumulative and for any given product, inherently have higher unit costs for a number of reasons, including:

- The cost of manufacturing the product is high, and there is less efficiency of scale;
- The cost of marketing and distributing niche products is higher than mass market products;
- Small companies have to divide fixed overhead by relatively low unit sales.

This is exacerbated by the costs to register and comply with energy efficiency standards. When divided over only dozens or hundreds of units sold annually, testing costs can add 5% to 25% or more to a product's selling price, and could be the determinative factor between profit and loss. As a consequence, it is vitally important that energy testing be done in a manner that is representative of actual energy consumption and does not unduly drive up the costs to comply with standards that provide inaccurate test measurements.

All of the products in this interim waiver application are compact refrigeration equipment. Compact refrigerators are primarily designed for situations where there are space limitations (either height or width or depth or a combination). As such, compact appliances do not have the options to decrease energy consumption by increasing the dimensions and adding additional insulating material. Compact appliances also have far more design limitations on the size and placement of components such as evaporators, condensers, compressors and fans because there are much smaller areas to work in.

Failure to obtain an interim waiver in a timely manner will create severe economic hardship to FSI. Products in this waiver request will all serve markets that have fewer choices than mainstream markets, which all offer increased consumer choice. None of the subject products are the most common 'dormitory' or office type compact refrigerators

sold through mass market retailers.[19] Some of the products in this waiver petition will serve markets where competitive products either use technology that uses much more energy (yet are not considered "covered" products by DOE), or force customers to use larger refrigerators than needed, which also may use more energy than needed.

FSI is developing new products that will have many benefits and offer consumers more energy efficient choices, which will comply with DOE standard in accordance with appropriate test procedures. Yet, these products, when measured by the current and proposed DOE test procedures, will not reflect their true energy consumption. There are valid reasons why these specialty refrigerators will be used in a completely different manner than the "typical" residential refrigerator. When energy consumption is measured in a representative manner, all are energy efficient and will comply with applicable DOE standards. All will contribute to the value added manufacturing done in our South Bronx facility. And all are intended to meet market demand in very small markets, and offer consumers a more suitable alternative to general purpose refrigerators. FSI has demonstrated that a single change to the test procedure will produce representative data, and allow FSI to market niche products that are the most suitable for some consumer applications.

The new DOE residential standards that take effect Sept. 15, 2014 will force significant industry wide changes. Smaller companies such as FSI will be the most adversely impacted as many products that cannot meet the new standards will be withdrawn from the market. With many FSI products only selling a few hundred units annually or even fewer, the R&D and design changes needed to reduce energy consumption are cost prohibitive. Without a stream of new products to hold revenue steady, companies such as FSI will suffer severe revenue loss, employment loss and are threatened.

The failure to issue this interim waiver will not only deprive FSI of the revenue and gross profit from this group of products, but it will weaken our competitive position in the marketplace. In the waiver application, FSI identifies about a dozen major players in the appliance marketplace we compete with, all of whom have over a billion dollars in annual revenue. All but two are foreign companies with large manufacturing operations. All, in varying degrees, compete with FSI. On common products, FSI is at a huge competitive disadvantage given all their economies of scale. FSI competes successfully because our niche products allow us to be more valuable to our resellers, and a certain amount of "common" products are sold alongside. Absent the niche products, our commodity products will suffer greatly as well.

As a consequence of these circumstances, FSI would suffer serious economic hardship, and would be at a competitive disadvantage unless an interim waiver is granted for the products in this petition.

Conclusion

[19] It is important to note that the overwhelming majority of compact appliances sold today fall into the categories of dormitory type or office type refrigerator-freezers. Dorm and office refrigerators are not the subject of this petition.

FSI initiated a petition for waiver for the list of specialty refrigerators that are designed to provide consumer choice in niche markets. These products differ substantially in their use from typical household or dormitory type refrigerators. The current test procedures measure energy use in a manner that is so unrepresentative of these products' true energy consumption that they provide materially inaccurate comparative data. FSI respectfully requests that you grant an interim waiver of the test procedures of 10 CFR §430, subpart B, appendix A1 and the proposed 10 CFR §430, subpart B, appendix A to the procedure outlined in our waiver request, so that it may avoid severe economic hardship while DOE processes the petition.

Respectfully submitted,
Paul Storch
Summit Appliance Div. Felix Storch, Inc.
770 Garrison Ave. Bronx, NY 10474 USA
PH. 718-893-3900
FAX: 718-842-3093
Email: paul@summitappliance.com

December 17, 2013

Building Technologies Program
U.S. Department of Energy
Test Procedure Waiver
1000 Independence Ave., SW
Mailstop EE-2J
Washington, DC 20585-0121

RE: ***Petition for Waiver of Test Procedures proposed for September 15, 2014 (*****10 CFR §430, Subpart B, Appendix A*****) pursuant to 10 CFR. § 430.27(a)(1) for Summit brand appliances as follows:***

- Keg Beer Coolers (Models SBC490B and SBC570R);
- Assisted Living Refrigerators (Models FF71TB, FF73, FF74, AL650R, ALB651BR, AL652BR, ALB653BR, CT66RADA, CT67RADA, AL750R, ALB751R, AL752BR, and ALB753LBR); and
- Ultra-Compact, Hotel Refrigerators (Models FF28LH, FF29BKH, FFAR21H, and FFAR2H).

INTRODUCTION

The Department of Energy ("DOE") provides a waiver process for refrigeration products when "the prescribed [10 CFR §430, Subpart B, Appendix A1 currently and the proposed 10 CFR §430, Subpart B, Appendix A] test procedures may evaluate [a product] . . . in a manner so unrepresentative of its true energy consumption characteristics . . . as to provide materially inaccurate comparative data." 10 C.F.R. §430.27. This petition seeks such a waiver for the above-referenced products from 2014 and forward test procedures for residential refrigerators provided in 10 CFR §430, Subpart B, Appendix A.

Felix Storch, Inc. ("FSI") is a small business engaged in importing, manufacturing, and distributing appliances to niche markets in the household, commercial, hospitality, institutional and medical community, as well as distributing household cooking and laundry appliances. Located in the South Bronx, New York, FSI employs approximately 150 individuals engaged in manufacturing, material handling, trucking, engineering, marketing, sales, shipping, clerical services and customer service. FSI, under the Summit brand name, imports refrigeration products from a number of factories in Europe, Mexico and Asia, as well as manufactures a number of products in New York. A significant part of FSI's business is value-added manufacturing conducted by FSI in its Bronx facility. Value-added manufacturing is the process of adding or modifying components or finishes to existing products in order to adapt these appliances for sale to special markets where few or no suitable products exist. The above-referenced models are all either built or modified in our Bronx facility.

DOE's test procedures are not appropriate for the above-referenced models because they fail to accurately reflect the actual energy consumption of the products during normal use. DOE test procedures for residential refrigeration (both the procedures in effect currently and the proposed procedures for 2014) require testing products at an ambient temperature of 90ºF. DOE selected that temperature (as opposed to a more normal 70ºF ambient) to simulate the effects of door openings and closings; such actions are not performed during the testing. *See* 10 CFR §430.23(a)(10) (The regulation explains, "[t]he intent of the energy test procedure is to simulate typical room conditions (approximately 70°F (21°C)) with door openings, by testing at 90°F (32.2°C) without door openings.").[20] However, the above-listed FSI products will be sold for uses where door openings and closings are highly infrequent.[21] All these products will consume far less energy during actual use than is measured by the existing and proposed testing procedures.

FSI seeks a waiver for the above-references products because:

1) Test procedures do not provide a fair and accurate representation of actual energy use;
2) The market size for each of these products is quite small;
3) The economic burden of complying with DOE standards in effect today, and the proposed standards for 2014, would place an undue economic burden on FSI;
4) There is an easily substituted alternate test procedure for these models;
5) Withdrawing these products from the marketplace would greatly limit consumer choice, adversely impact small business and, in some cases, result in compelling customers to turn to larger or less energy efficient products that increase overall energy consumption.

For these reasons, FSI respectfully requests a waiver, pursuant to 10 C.F.R. §430.27, of the test procedures for residential refrigerators provided in 10 CFR §430, Subpart B, Appendix A.

1. Models for which a waiver is requested.

This waiver request applies to the following models:

- Keg Beer Coolers (Models SBC490B; SBC570R);

[20] *See* 10 CFR 10 CFR §430.23(a)(10) (identifying 70°F as being representative of typical room temperature).

[21] It is important to note that the overwhelming majority of compact appliances sold today fall into the categories of dormitory type or office type refrigerator-freezers. FSI could not find statistics on door openings for these products, but since these types of units would be shared by multiple users, it is logical to assume their use would be similar to conventional refrigerators, as opposed to the special use models in this waiver petition.

- Assisted Living Refrigerators: (Models FF71TB, FF73, FF74, AL650R, ALB651BR, AL652BR, ALB653BR, CT66RADA, CT67RADA, AL750R, ALB751R, AL752BR, and ALB753LBR);
- Ultra-Compact, Hotel Refrigerators (Models FF28LH, FF29BKH, FFAR21H, and FFAR2H).

All of these models are intended for uses distinct from the typical household use whereby the doors on these products are seldom opened and closed.

2. Manufacturers of other basic models marketed in the United States are known by FSI to incorporate similar design characteristics.

Manufacturers of other basic models marketed in the United States and known to FSI that incorporate similar design characteristics are included in Attachment A.

3. Alternate test procedures are known to FSI to evaluate accurately energy consumption of the listed basic models.

FSI has extensive data that demonstrates that a single change to the test procedure will result in measuring energy consumption in a manner far more representative of actual use.

Testing the basic models listed in this petition at an ambient temperature of 70°F or 72°F, rather than 90°F will measure energy consumption in a manner significantly more representative of actual use than using the DOE prescribed test procedures, both under current standards and those proposed for implementation on September 15, 2014.

BACKGROUND

DOE acknowledges in 10 CFR §430.23(a)(10) that "[t]he intent of the energy test procedure is to simulate typical room conditions (approximately 70°F (21°C)) with door openings, by testing at 90°F (32.2°C) without door openings."

DOE uses 90ºF as a surrogate for running tests at typical ambient temperature to simulate the impact of opening and closing refrigerator and freezer doors. This standard is incorporated into the AHAM test procedures used by DOE in both the current standards and the upcoming 2014 standards. This temperature selection is at least 30 years old and is referenced in ANSI-AHAM HRF-1 (1979).[22]

[22] *American National Standard on Household Refrigerators and Household Freezers*, ANSI/AHAM HRF-1-1979 at 51-52, *available at*: https://law.resource.org/pub/us/cfr/ibr/001/aham.HRF-1.1979.pdf.

Several studies have attempted to validate this information. For example, one study showed that household refrigerators-freezers had a median of 48 fresh-food door openings and 10 freezer door openings per 24 hours.[23] A study based on this number of door openings concluded that 90ºF overstated energy consumption by 8.3% to 15.9%.[24] Several other studies corroborate these results.[25] For example, a study by the Florida Solar Energy Center measured door openings and closings in two person households and found an average of 42 openings per day. [26]

A National Institute of Standards ("NIST") study, commissioned by DOE, also demonstrated that when testing is performed at 90ºF, as little as a 2 degree difference in ambient temperature can result in a dramatic difference in measured energy consumption. [27] Alan Meier, an associate American Society of Heating, Refrigerating and Air-Conditioning Engineers ("ASHRAE") member, conducted a more exhaustive study of this correlation and found that for two groups of refrigerators extensively monitored, actual energy use averaged 13% and 15% less than the results from the yellow Energy Guide (which is based on AHAM procedures).[28] Mr. Meier reported that families typically open and close the doors of their refrigerators an average of 50 times daily. The study observed, "[r]elatively modest ambient temperature variations led to 50% changes in energy use."

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[23] *See* Danny S. Parker & Ted C. Stedman, *Measured Electricity Savings of Refrigerator Replacement: Case Study and Analysis*, Florida Solar Energy Center FSEC-PF-239-92 (1992) (citing Chang, Y.L., and R.A. Grot. 1979. *Field performance of residential refrigerators and combination refrigerator-freezers*. NBSIR 79-1781).

[24] James Y. Kao & George E. Kelly, *Factors Affecting the Energy Consumption of Two Refrigerator-Freezers*, SA-96-7-1 at 9 *available at:* http://fire.nist.gov/bfrlpubs/build96/PDF/b96070.pdf.

[25] *See e.g.*, NIST Study (citing Alan Meier and Richard Jansky, *Field Performance of Residential Refrigerators: A Comparison with the Laboratory Test*, LBL-31795 UC 150 (May 1991) *available at*: http://www.osti.gov/scitech/servlets/purl/6142295; Meier, A., et al. 1993; The New York refrigerator monitoring project: final report. Report No. LBL-33708. Berkeley, California: Lawrence Berkeley Laboratory; KEMA-XENERGY, Inc., *Final report measurement and evaluation study of 2002 statewide residential appliance recycling program*, 8-1 – 8- 8 (2004); Wong, M.T., W.R. Jones, B.T. Howell, and D.L. Long. 1995. Energy consumption testing of innovative refrigerator-freezer. *ASHRAE Transactions* 101(2).)

[26] Danny S. Parker & Ted C. Stedman, *Measured Electricity Savings of Refrigerator Replacement: Case Study and Analysis*, Florida Solar Energy Center FSEC-PF-239-92 (1992).

[27] David A. Yashar, *Repeatability of Energy Consumption Test Results for Compact Refrigerators*, U.S. Dept. of Commerce, Technology Administration National Institute of Standards and Technology at 7-8, 14 (September 2002), *available at*: http://fire.nist.gov/bfrlpubs/build00/PDF/b00055.pdf.

[28] Alan K. Meier, *Field performance of residential refrigerators*, ASHRAE Journal 36-40 (August 1999).

Another study by P.K. Bansal, also an ASHRAE member, states that,

> Elevated ambient temperatures used in most test procedures crudely simulate the heat loads from door openings. . . . This process fails to produce satisfactory results that could be representative of an in-situ real world refrigerator performance [29]

Even a 2010 study by the Energy Analysis Department of the Lawrence Berkeley Laboratory, CA, supported by DOE, stated, "[i]n many cases the test procedures do not reflect field usage[.]" [30]

These studies provide clear evidence that when refrigerator doors are opened infrequently, the AHAM procedures using 90°F as the ambient temperature will overstate energy consumption.

All of these studies were done on typical household refrigerator-freezers. FSI found no comparable data for compact refrigerators or, more specifically, on any of the type of products for which a waiver is sought in this petition. Indeed, DOE's own Technical Support Document, acknowledged that:

> "DOE found no data on the typical field energy consumption of compact refrigeration products. It therefore assumed that the average field energy use of compact refrigerators and freezers of a given size is the same as the maximum energy use allowed by the DOE standard as measured in the DOE test procedure. In effect, DOE assumed that variation in the field energy use of compact appliances is a function solely of volume".[31]

The approximation ignores the significantly important variable of the number of door openings and closings which greatly differs between a full size refrigerator used by a family and a specialty compact refrigerator used in a secondary application.

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[29] P.K. Bansal, *Studies on algorithm development for energy performance testing: study 2 – study of algorithms for domestic refrigeration appliances,* APEC#201-RE-01.11 at 19 (2001).

[30] Jim Lutz, et al. *How to make appliance standards work: improving the energy and water efficiency test procedures,* Ernest Orlando Lawrence Berkeley National Laboratory for Assistant Secretary for Energy Efficiency and Renewable Energy, Office of Building Technology, State and Community Programs, of the U.S. Department of Energy, LBNL#4961E at 1 (2010).

[31] U.S. Dept. of Energy, *Preliminary Technical Support Document: Energy Efficiency Program for Consumer Products: Refrigerators, Refrigerator-Freezers, and Freezers* at 7-38 (Nov. 2009), *available at:* http://www1.eere.energy.gov/buildings/appliance_standards/residential/pdfs/ref_frz_prenopr_prelim_tsd.pdf.

FSI performed tests on four representative models of refrigerators and beer dispensers, running tests at average 72ºF (room) temperature and at 90ºF. For one set of tests FSI opened and closed the doors of each unit six times per test, which exceeds the frequency of typical door openings and closings for these models. The second set of tests was conducted with doors remaining closed throughout the test. These tests consistently showed that all units at average 72ºF (room temperature) used over 40% less energy than when run at 90ºF. The tests with doors closed had a weighted average of 48% lower energy consumption than at 90ºF, and tests with door openings had a weighted average of 46% lower energy consumption. Door openings consistent with actual use, or tests without door openings, did not change the overall results or the conclusions.

A summary of this data is presented in the following tables.

Table 1
Tests with appropriate door openings and closings

Type	No. tests	Energy use at 90°F	Energy use at ambient	Percent decrease
			With doors opened/closed	
Beer Dispenser	2	1.16 kWh/day	0.68 kWh/day	41%
Hotel Refrigerator	4	1.04 kWh/day	0.59 kWh/day	43%
Assisted Living Unit 1	3	0.91 kWh/day	0.51 kWh/day	44%
Assisted Living Unit 2	6	1.10 kWh/day	0.55 kWh/day	50%

Table 2
Tests with doors closed

Type	No. tests	Energy use at 90°F kWh/day	Energy use at ambient	Percent decrease
			(no door openings)	
Beer Dispenser	6	1.16 kWh/day	0.65 kWh/day	44%
Hotel Refrigerator	5	1.04 kWh/day	0.55 kWh/day	47%
Assisted Living Unit 1	6	0.91 kWh/day	0.49 kWh/day	46%
Assisted Living Unit 2	8	1.10 kWh/day	0.52 kWh/day	53%

DISCUSSION OF DOOR OPENINGS AND CLOSINGS FOR THE MODELS IN THIS WAIVER PETITION

The units in this waiver application do not conform to the same usage as typical household full-size refrigerators: the doors on all of these basic units are opened and closed significantly less frequently than typical household refrigeration equipment. The units in this waiver petition also differ from the majority of compact refrigerator-freezers sold for dormitory or office use, which are typically shared by a number of users.

1. Keg Beer Coolers [Models SBC490B and SBC570R]

Beer coolers, by their nature, have their doors opened and closed **only** when a keg needs to be changed. Depending on usage, this may be once weekly, once monthly, or even less frequently. Beer in kegs is always provided in a chilled state, so in essence the beer cooler is not working to bring contents to the design temperature, but is only maintaining steady state conditions. The products in this waiver petition do not have shelves and are designed to store beer kegs only. Furthermore, use and care guides normally advise to turn off the electricity to the beer cooler while changing the keg, for both safety and energy conservation.

2. Assisted Living Refrigerators [Models FF71TB, FF73, FF74, AL650R, ALB651BR, AL652BR, ALB653BR, CT66RADA, CT67RADA, AL750R, ALB751R, AL752BR, and ALB753LBR)]

Refrigerators whose primary market is assisted living centers generally do not serve as a primary refrigerator.[32] These centers typically provide residents with three full meals a day, along with snacks during morning, afternoon, and evening activities. As such, these units serve as secondary storage that is opened and closed less frequently than primary household refrigerators. A limited survey of residents in two of these facilities done by FSI employees showed that fresh food doors were opened an average of 4 times daily, and freezer doors less than once. The refrigerators sold by FSI that are used in these assisted living studio apartments also differ from typical household or dormitory type refrigerators in design. They are usually frost free or partial automatic defrost for the convenience of an elderly population (compared to typical "dormitory" refrigerators that are usually manual defrost). Moreover, they are usually only 4 to 6 cubic feet compared to the 15 to 25 cubic feet typically found in homes or apartments.

3. Ultra-Compact Hotel Refrigerators [Models FF28LH, FF29BKH, FFAR21H, and FFAR2H]

FSI's proprietary ultra-compact refrigerators (with compressors) for hotel rooms are planned for introduction in early 2014 and are designed for guest convenience.[33] These refrigerators are priced at a premium, very compact, and normally would be

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[32] Assisted living facilities generally include meals as a standard feature. *See e.g.* Sunrise Senior Living, Assisted Living *available at*: http://www.sunriseseniorliving.com/care-and-services/assisted-living.aspx ("While services and amenities may vary by location, Sunrise assisted senior living communities generally provide . . . [t]hree delicious, well-balanced meals served daily[.]"); Friendship Assisted Living, Amenities *available at*: http://friendship.us/assisted-living/amenities-2/ ("Restaurant-style dining is available for three meals every day[.]"); HelpGuide.org, Assisted Living Facilities, *available at*: http://www.helpguide.org/elder/assisted_living_facilities.htm (showing that assisted living facilities typically provide three meals a day).

[33] Full size refrigerators used in hotel suites with kitchenettes or extended stay hotels are not part of the waiver application.

marketed only to upscale hotels. FSI estimates that guests will open and close the door to these units infrequently, if at all, since hotel rooms are generally occupied primarily during sleeping hours and meals are ordinarily eaten outside the room, or delivered by room service.[34] In addition, these units will not be in use when the hotel rooms are vacant.

As demonstrated above, testing the basic models in this waiver petition under the current and proposed test procedures would produce results that are "unrepresentative of its true energy consumption characteristics . . . as to provide materially inaccurate comparative data." 10 C.F.R. §430.27.

Based on the information presented, FSI proposes the following modifications be made to the DOE test procedures for the models named in this petition:

1. Beer dispensers (Models SBC490B and SBC570R); be tested at an ambient temperature of 70°F (per DOE's estimate of approximately 70° F as typical room-temperature) with the doors closed;
2. Hotel and assisting living refrigerators (Models FF71TB, FF73, FF74, AL650R, ALB651BR, AL652BR, ALB653BR, CT66RADA, CT67RADA, AL750R, ALB751R, AL752BR, ALB753LBR. FF28LH, FF29BKH, FFAR21H, and FFAR2H) be tested at 72°F to account for the very small number of daily door openings (where 2°F is 10% of the difference between 70°F and 90°F and door openings of these products groups are no more than 10% of the typical household refrigerators);
3. The units be tested for 24 continuous hours after stabilization to account for any timers used in the assisted living and hotel refrigerators; and
4. All other test procedures be conducted in accordance with AHAM and DOE test procedures for residential refrigerators.

ADDITIONAL ARGUMENTS FOR GRANTING THIS WAIVER

FSI targets niche markets with many models, including those referenced herein, where the overall sales volume is too limited to appeal to manufacturers driven by mass production and economies of scale. In some cases, not allowing products that address certain size or use needs to market will have the unintended consequences of substantially reducing consumer choice and driving energy consumption up through a switch to larger models.

[34] *See* American Hotel & Lodging Association, Eco-Friendly Case Studies, *available at*: http://www.ahla.com/Green.aspx?id=21756 (The Radisson Hotel Cleveland decided to unplug hotel room mini-refrigerators because "a majority of hotel guests did not use them during their stay.").

For example, in the case of the assisted living markets, withdrawing specialty products from this small, niche market may force facilities to purchase larger refrigerators than necessary, increasing overall energy usage. The convenience and accessibility of these compact products is often more appropriate for assisted living residents. If suitably sized products are not available, facilities might be forced to remodel a kitchenette when a refrigerator needs replacing.

In the case of the hotel industry, hotels (excluding extended stay hotels or suite type hotels) often use refrigerators that are driven by an absorption cooling system or by a thermoelectric cooling system (also called heat pipe systems). These cooling systems use significantly more energy than compressor systems, but are chosen by hotels for their low noise levels. It is important to note that these basic units may not be covered products for DOE because their design does not always allow them to reach the 39ºF threshold and, therefore, may not be considered a refrigerator per the statutory definition. [*See* 10 C.F.C. §430.2 (defining an electric refrigerator as "a cabinet designed for the refrigerated storage of food, designed to be capable of achieving storage temperatures above 32°F (0°C) and below 39°F (3.9°C), and having a source of refrigeration requiring single phase, alternating current electric energy input only.")]. Consequently, by excluding FSI compressor models from competing in this market, hotels will use models with absorption or thermoelectric systems which use substantially more energy than the excluded products.

ECONOMIC BURDEN OF THE REGULATIONS ON SMALL BUSINESS IN GENERAL AND FSI IN PARTICULAR

Failure to grant these basic models waivers from test procedures would have severe economic consequences for FSI.

Very large, multi-national corporations dominate the appliance market, led by Whirlpool and General Electric, whose sales are in the billions of dollars. Foreign companies with appliance sales in the billions of dollars and with a large U.S. presence include Electrolux (Frigidaire), LG, Samsung, Daiwoo, Bosch, Liebherr, Miele, AGA-Marvel, Bertazoni, Smeg, Haier, and Midea. FSI cannot compete with these companies' mass markets, with huge economies of scale on production, and distribution and insignificant compliance testing costs. FSI predominantly markets specialty appliances that respond to niche market demands and customer choice.

In response to DOE 2014 test procedures, FSI is working very hard to modify the vast majority of its residential refrigerator and freezer product line to comply with the new procedures. But in a number of niche markets with very small sales, the feasibility and costs of compliance are highly disproportionate for FSI to make a business case and will not result in energy savings. This results in an undue burden on FSI, for which these niche products form the nucleus of FSI's manufacturing operations and are the driver of job creation in disadvantaged economic development areas. Unlike the large companies mentioned above who can spread the cost of meeting current DOE and upcoming DOE 2014 standards and, in particular, test procedures over a base of millions, hundreds of

thousands, or tens of thousands of units, a small business like FSI does not have this option.

DOE has acknowledged the difficulties faced by both small manufacturers and the compact refrigeration industry dealing with standards. FSI falls into both categories and 90% of FSI's refrigeration business is restricted to compact classes. DOE reports that compact appliances only account for 2.5% of total energy consumed by all refrigeration products.[35] FSI's assumption is that at least 75% of that small number is consumed by college dormitory/office type products, meaning that less than 1% of total refrigeration energy use is consumed by "specialty" compact appliances, such as those listed in this petition. FSI's market share even in these small niche markets is quite limited. The appliances in this waiver application are a negligible part of that tiny subset and any energy consumption impacts from this waiver are highly de minimis at most. DOE recognizes the limited options available to compact appliance manufacturers, "[b]ecause of small production volumes, the impact of new standards on these manufacturers is relatively severe."[36] This is especially true ahead of DOE 2014 requirements, which mandate a 20% reduction of usage and few affordable alternatives for reducing energy consumption in niche appliances that meet consumer demand.

FSI greatly appreciates DOE's prompt attention to this petition for waiver, to allow for proper planning and avoiding additional, unnecessary economic hardship and financial burdens on FSI. Design changes to existing models and new product introductions routinely take 8 to 12 months for appliances. Without a prompt response to this petition for waiver, FSI cannot effectively plan its product line in a manner compliant with the new procedures and standards that take effect on September 15, 2014. For a small business manufacturer such as FSI, who specializes in niche product markets, uncertainty over test procedures will cause unnecessary costs without delivering any energy benefits or savings.

DOE in its guidance on waivers commits to act promptly on waiver requests[37].

> "First, the Department commits to act promptly on waiver requests and to update its test procedures to address granted waivers going forward. Second, to prevent the administrative waiver process from delaying or deterring the introduction of novel, innovative products into the marketplace, the Department, as a matter of enforcement policy, will refrain from enforcement actions related to pending waiver requests".

FSI appreciates DOE's recognition of the need to act promptly on these waiver requests and hopes DOE will take such an approach in responding to this petition in a manner that does not impose additional economic burdens on FSI. The objective is to assure that all

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[35] *See* Federal Register Vol. 62 No. 81, Page 23111, April 28, 1997.
[36] *Id.*
[37] GC Enforcement Guidance on the Application of Waivers and on the Waiver Process Issued: December 23, 2010, see http://energy.gov/sites/prod/files/gcprod/documents/LargeCapacityRCW_guidance_122210.pdf

test procedures result in representative indication of a product's true energy consumption, without imposing unnecessary costs on small business appliance manufacturers such as FSI.

CONCLUSIONS

The waiver process clearly is intended for situations where test procedures do not provide an accurate representation of actual energy consumption. FSI has demonstrated that the test procedures specified by DOE do not provide representative measure of the basic models in this waiver application, whose doors are opened and closed significantly less than typical household use.

FSI has demonstrated that:

- The use of 90°F is designed to simulate an average of 40 to 50 door openings per day and, even at that level, may overstate energy usage;
- The models listed in this waiver application have their doors opened and closed infrequently, and certainly significantly less than the simulation average;
- An alternate test procedure is readily available consisting of testing the products at 70°F or 72°F, over a 24 hour period, and holding all other test procedures in accordance with AHAM Procedures and 10 CFR §430, Subpart B, Appendix A;
- Failure to grant this waiver will cause severe economic hardship to FSI, and in some cases, will cause energy consumption to be higher than if the waiver were granted.

FSI respectfully requests DOE waive the test procedures for the products listed in the petition as these "test procedures may evaluate [these product] . . . in a manner so unrepresentative of [their] true energy consumption characteristics . . . as to provide materially inaccurate comparative data." 10 C.F.R. §430.27. All of these basic units have materially different uses than the average products subject to the test procedures. The proposed alternative procedures will provide an accurate representation of actual energy use. For these reasons, FSI respectfully requests that DOE substitute our proposed test procedures and waive the test procedures at 10 CFR §430, Subpart B, Appendix A for FSI's beer coolers, assisted living refrigerator-freezers and hotel refrigerators.

Respectfully submitted,
Paul Storch, President
Summit Appliance Div. Felix Storch, Inc.
770 Garrison Ave. Bronx, NY 10474 USA
PH. 718-893-3900
FAX: 718-842-3093

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