[6450-01-P]

DEPARTMENT OF ENERGY

Office of Energy Efficiency and Renewable Energy

[Case No. CR-007]

Notice of Petition for Waiver of ITW Food Equipment Group, LLC from the Department of Energy Commercial Refrigeration Equipment 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 ITW Food Equipment Group, LLC (ITW) seeking an exemption from specified portions of the U.S. Department of Energy (DOE) test procedure for determining the energy consumption of commercial refrigeration equipment under the regulations for basic models of their Innopod temperature controlled grocery and general merchandise system (Innopod). ITW requests modifications, as specified in its petition for waiver, to the existing DOE test procedure, which references Air-Conditioning, and Refrigeration Institute (ARI) Standard 1200-2006 and Air-Conditioning, Heating, and Refrigeration Institute (AHRI) Standard 1200 (I-P)-2010 that further references American National Standards Institute/American Society of Heating, Refrigerating and Air-Conditioning Engineers (ANSI/ASHRAE) Standard 72. ITW submitted to DOE an alternate test procedure that allows for

testing of specified Innopod basic models. This notice also announces that DOE has granted ITW an interim waiver from the DOE commercial refrigeration equipment test procedures for the specified commercial refrigeration equipment basic models, subject to use of the alternative test procedure as set forth in this notice. DOE solicits comments, data, and information concerning ITW's petition and its suggested alternate test procedure.

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

ADDRESSES: You may submit comments, identified by Case No. CR-007, 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. CR-007] 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. CR-007, 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 *http://www.regulations.gov*. All documents in the docket are listed in the *http://www.regulations.gov* index. However, some documents listed in the index, such as those containing information that is exempt from public disclosure, may not be publicly available.

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: *AS_Waiver_Requests@ee.doe.gov*.

SUPPLEMENTARY INFORMATION:

I. Background and Authority

Title III, Part C[1] of the Energy Policy and Conservation Act of 1975 (EPCA), Public Law 94-163 (42 U.S.C. 6311-6316, as codified) established the Energy Conservation Program for Certain Industrial Equipment, which includes commercial refrigeration equipment.[2] Part C includes definitions, test procedures, labeling provisions, energy conservation standards, and the authority to require information and reports from manufacturers. Further, Part C authorizes the Secretary of Energy to prescribe test procedures that are reasonably designed to produce results that

[1] For editorial reasons, upon codification in the U.S. Code, Part C was redesignated as Part A-1.
[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).

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. 6314(a)(2)) The test procedure for commercial refrigeration equipment is contained in Title 10 of the CFR part 431, subpart C, appendix B, "*Amended Uniform Test Method for the Measurement of Energy Consumption of Commercial Refrigerators, Freezers, and Refrigerator-Freezers*."

DOE's regulations set forth at 10 CFR 431.401 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 equipment when the petitioner's basic model for which the petition for waiver was submitted contains one or more design characteristics that either (1) prevent testing according to the prescribed test procedures; or (2) cause the prescribed test procedures to evaluate the basic model in a manner so unrepresentative of its true energy consumption as to provide materially inaccurate comparative data. 10 CFR 431.401(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 431.401(b)(1)(iii).

DOE may grant a waiver subject to conditions, including adherence to alternate test procedures. 10 CFR 431.401(f)(2). As soon as practicable after the granting of any waiver, DOE will publish in the *Federal Register* a notice of proposed rulemaking to amend its regulations so as to eliminate any need for the continuation of such waiver. As soon thereafter as practicable, DOE will publish in the *Federal Register* a final rule. 10 CFR 431.401(l).

The waiver process also allows DOE to grant an interim waiver if it appears likely that the petition for waiver will be granted and/or if DOE determines that it would be desirable for public policy reasons to grant immediate relief pending a determination on the petition for waiver. 10

CFR 431.401(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 431.401(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 431.401(h)(2).

II. ITW's Petition for Waiver of Test Procedure and Application for Interim Waiver

On December 20, 2016, ITW submitted a petition for waiver and interim waiver pursuant to 10 CFR 431.401 pertaining to DOE's test procedure at 10 CFR part 431, subpart C, appendix B, for their Innopod temperature controlled grocery and general merchandise system (Innopod) basic models of commercial refrigeration equipment. ITW's initial petition included twenty-two base model configurations. On May 3, 2017, ITW provided DOE with the complete list of 200 basic models covered by the twenty-two base model configurations. ITW petitioned for a waiver and interim waiver from various DOE test procedure requirements.

DOE's current test procedure references Air-Conditioning, and Refrigeration Institute (ARI) Standard 1200-2006 and Air-Conditioning, Heating, and Refrigeration Institute (AHRI) Standard 1200 (I-P)-2010, which further references American National Standards Institute/American Society of Heating, Refrigerating and Air-Conditioning Engineers (ANSI/ASHRAE) Standard 72 (incorporated by reference at 10 CFR 431.63 (c) and (d)). ITW asserts that these current test procedures do not account for the unique operating characteristics of the Innopod basic models. Because the specific design of this product line contains one or more design characteristics noted in the waiver request, including floating suction temperatures for individual compartments, different

typical door-opening cycles, and a high-temperature "ambient" compartment, ITW believes that its petition and combined application meets both conditions of 10 CFR 431.401(a)(1) for granting waivers, on the grounds that: (1) The petitioner's basic model contains one or more design characteristics that prevent testing according to the prescribed test procedures; and (2) The prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy consumption as to provide materially inaccurate comparative data. ITW submitted to DOE an alternate test procedure that allows for testing of its Innopod basic models.

ITW's Innopod basic models include multiple thermally separated, temperature controlled compartments supplied with refrigerant from a single condensing unit. ITW's petition proposes an alternate test using an "inverse refrigeration load" test, various calculations to account for refrigeration system and component energy consumption, and adjustments to the door opening requirements based on typical use in the field. ITW's proposed refrigeration system calculations rely on the current calculations and assumptions used for testing remote condensing commercial refrigeration equipment in accordance with the DOE test procedure.

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 431.401(e)(2).

DOE understands that absent an interim waiver, the basic models identified by ITW 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 suggested by ITW and concludes that it will allow for the accurate measurement of the energy use of these equipment,

while alleviating the testing problems associated with ITW's implementation of DOE's applicable commercial refrigeration equipment test procedure for the specified Innopod models. However, DOE has clarified how ITW should determine basic models, as discussed in section III of this notice, and adjusted certain aspects of the requested alternate test procedure regarding ambient test conditions, referenced industry standards, and calculations, as discussed in section IV of this notice. Thus, DOE has determined that ITW's petition for waiver will likely be granted and has decided that it is desirable for public policy reasons to grant ITW immediate relief pending a determination on the petition for waiver.

III. Petition for Waiver and Interim Waiver Basic Models

ITW's initial petition for waiver and interim waiver, submitted on December 20, 2016, included a list of twenty-two "base model configurations" of its Innopod equipment. However, based on the descriptions of the compartment configurations provided for each base model configuration, DOE expects that the list does not provide each basic model to which the waiver and interim waiver would apply.

Specifically, DOE noted that many of the base model configurations include compartments that are convertible between the freezer and refrigerator temperature operating ranges. With respect to multi-mode operation, DOE has taken the position in the most recent commercial refrigeration equipment test procedure final rule that self-contained equipment or remote condensing equipment with thermostats capable of operating at temperatures that span multiple equipment categories must be certified and comply with DOE's regulations for each applicable equipment category. 79 FR 22291 (April 21, 2014).

Additionally, DOE notes that its current regulations allow for the use of alternative efficiency determination methods (AEDMs), which allow manufacturers to simulate the energy use of untested basic models once a manufacturer has a validated AEDM and could be used to simulate results at other rating temperatures. 10 CFR 429.70.

Under DOE's definition of a basic model as "equipment manufactured by one manufacturer within a single equipment class, having the same primary energy source, and that have essentially identical electrical, physical, and functional characteristics that affect energy consumption" (10 CFR 431.62), the base model configurations in ITW's initial petition would represent multiple basic models depending on the set point of the convertible compartments. DOE requested that ITW provide an updated list of basic models, consistent with DOE's definition of basic model, that would be covered by the petition for waiver and request for interim waiver. ITW provided DOE with the updated list of basic model numbers on May 3, 2017.

ITW's petition also describes compartments that are convertible between refrigerator and ambient temperature ranges. These compartments would only be considered refrigerator compartments under DOE's definitions (compartments capable of operating at or above 32 °F (±2 °F)). Accordingly, these compartments would only be tested and rated at the refrigerator compartment standardized temperature (38 °F).

IV. Summary of Grant of Interim Waiver

For the reasons stated in section II of this notice, DOE has granted ITW's application for interim waiver from testing for its specified commercial refrigeration equipment basic models, with minor modifications to the proposed approach. The substance of the interim waiver is summarized

below.

ITW is required to test and rate the specified ITW commercial refrigeration equipment Innopod basic models[3] according to the alternate test procedure as set forth in section V, "Alternate Test Procedure." DOE has revised ITW's proposed test approach to reflect ambient test conditions that are consistent with those required in the DOE test procedure. DOE has determined that the ambient condition requirement would not prevent testing of the Innopod basic models.

[3] 30-XX-X5-AAAAR, 30-XX-X5-AAARA, 30-XX-X5-AAARR, 30-XX-X5-AAAFA, 30-XX-X5-AAAFR, 30-XX-X5-AARAA, 30-XX-X5-AARAR, 30-XX-X5-AARRA, 30-XX-X5-AARRR, 30-XX-X5-AARFA, 30-XX-X5-AARFR, 30-XX-X5-AAFAA, 30-XX-X5-AAFAR, 30-XX-X5-AAFRA, 30-XX-X5-AAFRR, 30-XX-X5-AAFFA, 30-XX-X5-AAFFR, 30-XX-X5-ARAAA, 30-XX-X5-ARAAR, 30-XX-X5-ARARA, 30-XX-X5-ARARR, 30-XX-X5-ARAFA, 30-XX-X5-ARAFR, 30-XX-X5-ARRAA, 30-XX-X5-ARRAR, 30-XX-X5-ARRRA, 30-XX-X5-ARRRR, 30-XX-X5-ARRFA, 30-XX-X5-ARRFR, 30-XX-X5-ARFAA, 30-XX-X5-ARFAR, 30-XX-X5-ARFRA, 30-XX-X5-ARFRR, 30-XX-X5-ARFFA, 30-XX-X5-ARFFR, 30-XX-X5-AFAAA, 30-XX-X5-AFAAR, 30-XX-X5-AFARA, 30-XX-X5-AFARR, 30-XX-X5-AFAFA, 30-XX-X5-AFAFR, 30-XX-X5-AFRAA, 30-XX-X5-AFRAR, 30-XX-X5-AFRRA, 30-XX-X5-AFRRR, 30-XX-X5-AFRFA, 30-XX-X5-AFRFR, 30-XX-X5-AFFAA, 30-XX-X5-AFFAR, 30-XX-X5-AFFRA, 30-XX-X5-AFFRR, 30-XX-X5-RAAAA, 30-XX-X5-RAAAR, 30-XX-X5-RAARA, 30-XX-X5-RAARR, 30-XX-X5-RAAFA, 30-XX-X5-RAAFR, 30-XX-X5-RARAA, 30-XX-X5-RARAR, 30-XX-X5-RARRA, 30-XX-X5-RARRR, 30-XX-X5-RARFA, 30-XX-X5-RARFR, 30-XX-X5-RAFAA, 30-XX-X5-RAFAR, 30-XX-X5-RAFRA, 30-XX-X5-RAFRR, 30-XX-X5-RAFFA, 30-XX-X5-RAFFR, 30-XX-X5-RRAAA, 30-XX-X5-RRAAR, 30-XX-X5-RRARA, 30-XX-X5-RRARR, 30-XX-X5-RRAFA, 30-XX-X5-RRAFR, 30-XX-X5-RRRAA, 30-XX-X5-RRRAR, 30-XX-X5-RRRRA, 30-XX-X5-RRRFA, 30-XX-X5-RRFAA, 30-XX-X5-RRFAR, 30-XX-X5-RRFRA, 30-XX-X5-RRFFA, 30-XX-X5-RFAAA, 30-XX-X5-RFAAR, 30-XX-X5-RFARA, 30-XX-X5-RFARR, 30-XX-X5-RFAFA, 30-XX-X5-RFAFR, 30-XX-X5-RFRAA, 30-XX-X5-RFRAR, 30-XX-X5-RFRRA, 30-XX-X5-RFRFA, 30-XX-X5-RFFAA, 30-XX-X5-RFFAR, 30-XX-X5-RFFRA, 30-XX-X5-FAAAA, 30-XX-X5-FAAAR, 30-XX-X5-FAARA, 30-XX-X5-FAARR, 30-XX-X5-FAAFA, 30-XX-X5-FAAFR, 30-XX-X5-FARAA, 30-XX-X5-FARAR, 30-XX-X5-FARRA, 30-XX-X5-FARRR, 30-XX-X5-FARFA, 30-XX-X5-FARFR, 30-XX-X5-FAFAA, 30-XX-X5-FAFAR, 30-XX-X5-FAFRA, 30-XX-X5-FAFRR, 30-XX-X5-FRAAA, 30-XX-X5-FRAAR, 30-XX-X5-FRARA, 30-XX-X5-FRARR, 30-XX-X5-FRAFA, 30-XX-X5-FRAFR, 30-XX-X5-FRRAA, 30-XX-X5-FRRAR, 30-XX-X5-FRRRA, 30-XX-X5-FRRFA, 30-XX-X5-FRFAA, 30-XX-X5-FRFAR, 30-XX-X5-FRFRA, 30-XX-X5-FFAAA, 30-XX-X5-FFAAR, 30-XX-X5-FFARA, 30-XX-X5-FFARR, 30-XX-X5-FFRAA, 30-XX-X5-FFRAR, 30-XX-X5-FFRRA, 30-XX-X4A-AAAR, 30-XX-X4A-AARA, 30-XX-X4A-AARR, 30-XX-X4A-ARAA, 30-XX-X4A-ARAR, 30-XX-X4A-ARRA, 30-XX-X4A-ARRR, 30-XX-X4A-AFAA, 30-XX-X4A-AFAR, 30-XX-X4A-AFRA, 30-XX-X4A-AFRR, 30-XX-X4A-RAAA, 30-XX-X4A-RAAR, 30-XX-X4A-RARA, 30-XX-X4A-RARR, 30-XX-X4A-RRAA, 30-XX-X4A-RRAR, 30-XX-X4A-RRRA, 30-XX-X4A-RFAA, 30-XX-X4A-RFAR, 30-XX-X4A-RFRA, 30-XX-X4A-FAAA, 30-XX-X4A-FAAR, 30-XX-X4A-FARA, 30-XX-X4A-FARR, 30-XX-X4A-FRAA, 30-XX-X4A-FRAR, 30-XX-X4A-FRRA, 30-XX-X4A-FFAA, 30-XX-X4A-FFAR, 30-XX-X4A-FFRA, 30-XX-X4B-AAAR, 30-XX-X4B-AARA, 30-XX-X4B-AARR, 30-XX-X4B-AAFA, 30-XX-X4B-AAFR, 30-XX-X4B-ARAA, 30-XX-X4B-ARAR, 30-XX-X4B-ARRA, 30-XX-X4B-ARRR, 30-XX-X4B-ARFA, 30-XX-X4B-ARFR, 30-XX-X4B-AFAA, 30-XX-X4B-AFAR, 30-XX-X4B-AFRA, 30-XX-X4B-AFRR, 30-XX-X4B-AFFA, 30-XX-X4B-AFFR, 30-XX-X4B-RAAA, 30-XX-X4B-RAAR, 30-XX-X4B-RARA, 30-XX-X4B-RARR, 30-XX-X4B-RAFA, 30-XX-X4B-RAFR, 30-XX-X4B-RRAA, 30-XX-X4B-RRAR, 30-XX-X4B-RRRA, 30-XX-X4B-RRFA, 30-XX-X4B-RFAA, 30-XX-X4B-RFAR, 30-XX-X4B-RFRA, 30-XX-X4B-RFFA, 30-XX-XX-3-AAR, 30-XX-XX-3-30-XX-XX-3-ARA, 30-XX-XX-3-ARR, 30-XX-XX-3-RAA, 30-XX-XX-3-RAR, and 30-XX-XX-3-RRA.

Additionally, DOE has revised ITW's proposed alternate approach to reference the current version of the AHRI 1200 standard referenced in DOE's existing test procedure. Further, DOE has clarified certain details of the necessary measurements and calculations in the granted interim waiver.

In addition, DOE is requiring that ITW test compartments in all relevant equipment configurations, as required by the current test procedure. Any compartments that are convertible between the refrigerator and freezer operating temperature ranges must be tested and rated under both test settings; however, the compartments in the ITW equipment that are convertible between ambient and refrigerator temperature ranges must be tested only at the refrigerator standardized compartment temperature of 38 ºF, as described in section III of this notice.

ITW must make representations about the energy use of these basic models for compliance, marketing, or other purposes only to the extent that such equipment 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 part 429, subpart B.

DOE makes decisions on waivers and interim waivers for only those basic models specifically set out in the petition, not future models that may be manufactured by the petitioner. ITW 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 models set forth in the original petition consistent with 10 CFR 431.401(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 431.401(a) and (i).

The interim waiver shall remain in effect consistent with 10 CFR 431.401(h). 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 431.401(k).

V. Alternate Test Procedure

EPCA requires that manufacturers use DOE test procedures when making representations about the energy consumption and energy consumption costs of equipment covered by the statute. (42 U.S.C. 6293(c); 6314(d)) Consistent representations about the energy efficiency of covered equipment are important for consumers evaluating equipment 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 431.401, and after considering public comments on the petition, DOE will announce its decision as to an alternate test procedure for ITW in a subsequent Decision and Order.

During the period of the interim waiver granted in this notice, ITW shall test the basic models listed in section IV according to the test procedure for commercial refrigeration equipment prescribed by DOE at 10 CFR part 431, subpart C, appendix B, with some of the modifications to the existing DOE test requirements as specified in ITW's petition. However, DOE is requiring that ITW test its Innopod basic models according to the ambient test conditions as outlined in AHRI Standard 1200 (I-P)-2010 section 4.1.2, which requires a wet-bulb test room temperature of 64.4 ºF

± 1.8 ºF, rather than the conditions requested in the petition for waiver, which instead specify a test room dew point. Additionally, DOE has revised ITW's proposed alternate approach to reference the current version of the AHRI 1200 standard referenced in DOE's existing test procedure, AHRI Standard 1200 (I-P)-2010. DOE has also clarified certain instructions, calculations, and measurements necessary to conduct the alternate test. Accordingly, DOE grants an interim waiver to ITW, but with modifications to ITW's requested approach. The applicable method of test for the specified ITW basic models is the test procedure for commercial refrigeration equipment prescribed by DOE at 10 CFR 431, subpart C, appendix B, with the following modifications:

For the purpose of testing and rating, the Ambient (75 ºF) compartment is treated as a Medium (Refrigerator at 75 ºF) compartment. All volume and energy consumption calculations will be included within the Medium (Refrigerator 38 ºF) category and summed with other Medium (Refrigerator 38 ºF) compartment calculation(s). Compartments that are convertible between ambient and refrigerator temperature ranges shall be tested at the refrigerator temperature (38 ºF). Compartments that are convertible between refrigerator and freezer (0 ºF) temperature ranges shall be tested at both temperatures.

Test Condition/s or Calculation/s	**Alternate Innopod Test Procedure**
Test Method	"Inverse Refrigeration Load" test Allows energy (Heat) loss at a rate and delta-T equivalent to energy gains of a standard refrigerated cabinet.
Ambient	Dry Bulb: 75.2 ºF ±1.8 ºF Wet Bulb: 64.4 ºF±1.8 ºF
Integrated Average Temperature (IAT) Simulated Product vs. Test Ambient Delta-T	Refrigerator: (75.2 ºF + 75.2 ºF – 38 ºF) = 112.4 ºF ±2 ºF Freezer: (75.2 ºF + 75.2 ºF – 0 ºF) = 150.4 ºF ±2 ºF Ambient: (75.2 ºF + 75.2 ºF – 75 ºF) = 75.4 ºF ±2 ºF *To ensure compartment temperature stability, the average of all temperature measurements at the end of the test period must be no lower than the average of all temperature measurements at the start of the test period. Inside / Outside / Delta-T Refrigerator: 112.4 ºF / 75.2 ºF / 37.2 ºF Freezer: 150.4 ºF / 75.2 ºF / 75.2 ºF Ambient: 75.04 ºF / 75.2 ºF / 0.4 ºF

	Heat – LOSS = Heat – GAIN as prescribed in the test procedure
Door-Opening Requirement	Door openings shall start 3 hours after concluding stabilization period. Open each door for 8 seconds, every 2 hours, for 10 consecutive hours. (6 door cycles) (3 "load" and "unload" cycles) > Stock (load) + Retrieve (un-load) = Cycle (turn)
Calculation of Refrigeration Load	Total energy added divided by the total test time. "Inverse Refrigeration Load" $Q = \frac{\text{Win (watt-hour)} \times 3.412 \text{ (BTU/watt-hour)}}{\text{t (Hr.)}} = \text{(BTU/Hr.)}$ Where: Win = energy input measured over test period for all energized components (heaters, controls, and fans) located in the refrigerated compartments. Anti-sweat heaters shall be de-energized for the test. t = test duration (24 hours) Provides the "energy removed" by infiltration.
Adjusted Dew Point & EER AHRI 1200-2010 Table 1, EER	Dew Point (D.P.): Derived from standard industry design practices, "as the customary saturated vapor temperature of the refrigerant as it leaves the cabinet through the suction line." The Energy Efficiency Ratio is then taken from this value using Table 1. EER A.D.P.: Med. Temp. = (D.P.: +15 ºF) – 2 ºF = +13 ºF EER = 11.22 Btu/Wh A.D.P.: Low Temp. = (D.P.: -20 ºF) – 3 ºF = -23 ºF EER = 6.60 Btu/Wh
Calculated Daily Energy Consumption AHRI 1200-2010	Part 1: REVISED, Calculation of CEC $CEC = [(Q \times t) + ML + (FEC + AEC + DEC) \times 3.412] / (1000 \times EER)$ >"Q" does NOT include waste heat from auxiliary components and moisture infiltration (must be added separately). Where: ML: Moisture load impacts (see below) FEC: Evaporator Fan/s [measured fan power × runtime per day] (Wh/day) AEC: Anti-Condensate Heater/s [measured heater power × runtime per day] (Wh/day) DEC: Defrost Heater/s [measured heater power × runtime per day] (Wh/day) Moisture load impact calculations: Total impact: Number of door openings times (Enthalpy Adjustment + Moisture/frost Accumulation): $ML = N_d \times (A_e + A_m)$ Where N_d = number of door openings during test Enthalpy Adjustment: $A_e = [(H_a - H_c) - (H_t - H_a)] \times m_a$ Where: H_a = ambient air enthalpy H_c = compartment air enthalpy based on air conditions during cold operation: 0 ºF dry bulb/-20 ºF dew pt. for freezer compartment; 38 ºF dry bulb/20 ºF dew pt. for refrigerator compartment; 75 ºF dry bulb/20 ºF dew pt. for ambient compartment. H_t = compartment air enthalpy during heat leak test based on dew point being equal to ambient air dew point m_a = mass of compartment air exchanged (30% of total compartment volume) based density of air during cold operation. Moisture/frost Accumulation: $A_m = C_{p,liner} \times W_{liner} \times \Delta T_{liner}$ Where: $C_{p,liner}$ = specific heat of liner material W_{liner} = weight of all liner parts ΔT_{liner} = maximum temperature rise of all liner parts (4.5 °F, 2.5 °F, and 1 °F for freezer, refrigerator, and ambient compartments, respectively) Part 2: Current, Calculation of CDEC CDEC = CEC + FEC + AEC + DEC + (any additional component energy consumption)

VI. Summary and Request for Comments

Through this notice, DOE announces receipt of ITW's petition for waiver from the DOE test procedure for certain basic models of ITW commercial refrigeration equipment, and announces DOE's decision to grant ITW an interim waiver from the test procedure for the specified basic models of commercial refrigeration equipment. DOE is publishing ITW's petition for waiver in redacted form, pursuant to 10 CFR 431.401(b)(1)(iv). The petition contains confidential information. The petition includes a suggested alternate test procedure to determine the energy consumption of specific basic models of commercial refrigeration equipment. DOE may consider including this alternate procedure in a subsequent Decision and Order based on comments from interested parties. However, DOE has tentatively determined that the alternate procedure proposed by ITW is not entirely acceptable and has provided a modified alternate test procedure as a part of its grant of an interim waiver. DOE will consider public comments on the petition in issuing its 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 431.401(d), any person submitting written comments to DOE must also send a copy of such comments to the petitioner. The contact information for the petitioner's representative is Ms. Mary Dane, Agency Approval Engineer, ITW Food Equipment Group, LLC, North American Refrigeration, 4401 Blue Mound Rd., Fort Worth, TX 76106. All comment submissions must include the agency name and Case No. CR-007 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 July 11, 2017

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

INNOPOD TEMPERATURE CONTROLLED GROCERY AND GENERAL MERCHANDISE [redacted] SYSTEM

DEPARTMENT OF ENERGY PETITION FOR WAIVER AND APPLICATION FOR INTERIM WAIVER

December 20, 2016
Supplemented-May 3, 2017

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ITW FOOD EQUIPMENT GROUP, LLC-NORTH AMERICAN REFRIGERATION
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EXECUTIVE SUMMARY

ITW, Food Equipment Group, LLC-North American Refrigeration, henceforth referred to as "Traulsen" is located in Fort Worth, TX and has been manufacturing a diverse line of commercial refrigeration equipment (CRE) and hot food holding products for over 75 years.

Traulsen has been a proud Energy Star Partner for many years, as well as a supporter of other endeavors focusing on products that use energy responsibly. We actively engage with several organizations providing solutions for various specifications and product test standards, including Southern California (SoCal) Edison, UL, LLC[1], NSF, International, ASHRAE and the American National Standards Institute or "ANSI". Our strong reputation providing highly-customized, niche applications, or "Engineer to Order" (ETO) solutions, has led customers such as independent consultants and facility designers to bring us innovative concepts for new ways to do business.

In recent years, retail grocers have seen a significant uptick in the home delivery service arena. Using lessons learned in the international market, Traulsen – in response to specific customer requests - has worked to anticipate the needs of the emerging U.S. grocery market. We have engineered an innovated solution that allows customers' outdoor and remote pick-up point access to groceries (even beyond grocery store property) while maintaining the safety and integrity of their food purchases.

Traulsen is filing this combined petition for waiver and application of interim waiver specific to the introduction of the Innopod Temperature Controlled Grocery and General Merchandise [redacted] System, referred to herein as "Innopod."

[redacted]

[1] Formerly known as Underwriter's Laboratories.

The Innopod [redacted] have been designed to meet the DOE 2017 energy requirement limits for [redacted]

Traulsen believes that this petition and its combined application substantiates and meets both conditions of 10 CFR 431.401(a) (1) for granting waivers, on the grounds that:

1. The petitioner's basic model contains one or more design characteristics that prevent testing according to the prescribed test procedures; and

2. The prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy consumption as to provide materially inaccurate comparative data.[2]

The application will describe the evaluation methodology in our test procedure waiver request as well as explain how the variation in volume and maximum daily energy consumption "MDEC" values are calculated caused by the unique design classification of a product uniquely designed in the [redacted] category.

[2] 10 CFR 431.401(a) (1)

DESCRIPTION OF UNIT SPECIFICATION AND DESIGN CHARACTERISTICS THAT PREVENT TESTING ACCORDING TO TEST PROCEDURES

Innopod are an "E ed to Order" (ETO) The is thermally separated, temperature controlled temperature controls packaged and potentially hazardous foodstuff[3] temperature for short term holding periods. The customer has a timeframe in which to retrieve a grocery order or the grocer recovering the unclaimed foodstuff in the next deliver or "LOAD" cycle.

[redacted]

[3] Note: NSF/ANSI 170-2014 defines "potentially hazardous food" as: A food that is natural or synthetic and requires temperature control because it is in a form capable of supporting the following: rapid and progressive growth of infectious or toxigenic microorganisms; growth and toxin production of *Clostridium botulinum;* or, as in raw shell eggs, the growth of *Salmonella enteritidis.*

Potentially hazardous food includes animal food (a food of animal origin) that is raw or heat-treated; food of plant origin that is heat-treated or consists of raw seed sprouts; cut melons; and garlic and oil mixtures that are not acidified or otherwise modified a food processing plant in a way that results in mixtures that do not support growth as specified above."

[redacted]

[redacted] each [redacted] is installed under special permit by skilled installers in [redacted]

The [redacted]s designed to support the cold food chain and maintain temperatures according to the applicable NSF 7 standard. If the temperature within the [redacted] exceeds the designated safe temperature threshold for a specific time period, the customer is prevented from collecting their order [redacted]

When in use, [redacted] will be operated at [redacted].

[redacted]

[redacted]

[4] See Annex B for state by state temperature range information.

[redacted]

[redacted]

A condensing unit is [redacted] controlled (cycled ON and OFF) by [redacted] This control functionality is similar to that found on a parallel rack in a supermarket environment in that refrigeration capacity is managed with a floating or moving saturated suction temperature.

The desired saturated suction temperature is based on or relative to the desired compartment temperature currently being cooled [redacted]

The condensing unit is composed of [redacted]

[redacted]

[redacted]

[redacted]

[5] Depending on the size of the vehicle used, there is a defined maximum number of deliveries that can be met during a single delivery route cycle. This tends to be around 18-20 deliveries assuming that each customer has placed a 'standard order' of mixed temperature items. This means the average delivery vehicle will travel between 20 individual addresses during a 4 hour route, and not necessarily in the most efficient fashion as the vehicle may have to return to areas previously visited in order to meet a 2 hour delivery window allowance. The vehicle also tends to be left curbside idling in order to enable maintenance of temperature within the storage areas while it is stopped at each of the drop off addresses adding additional environmental concerns related to air quality.

SPECIFIC REQUIREMENTS SOUGHT TO BE WAIVED IN ORDER TO PROPERLY EVALUATE THE INNOPOD TO ASHRAE 72 -2014, SECTION 7

Summary:

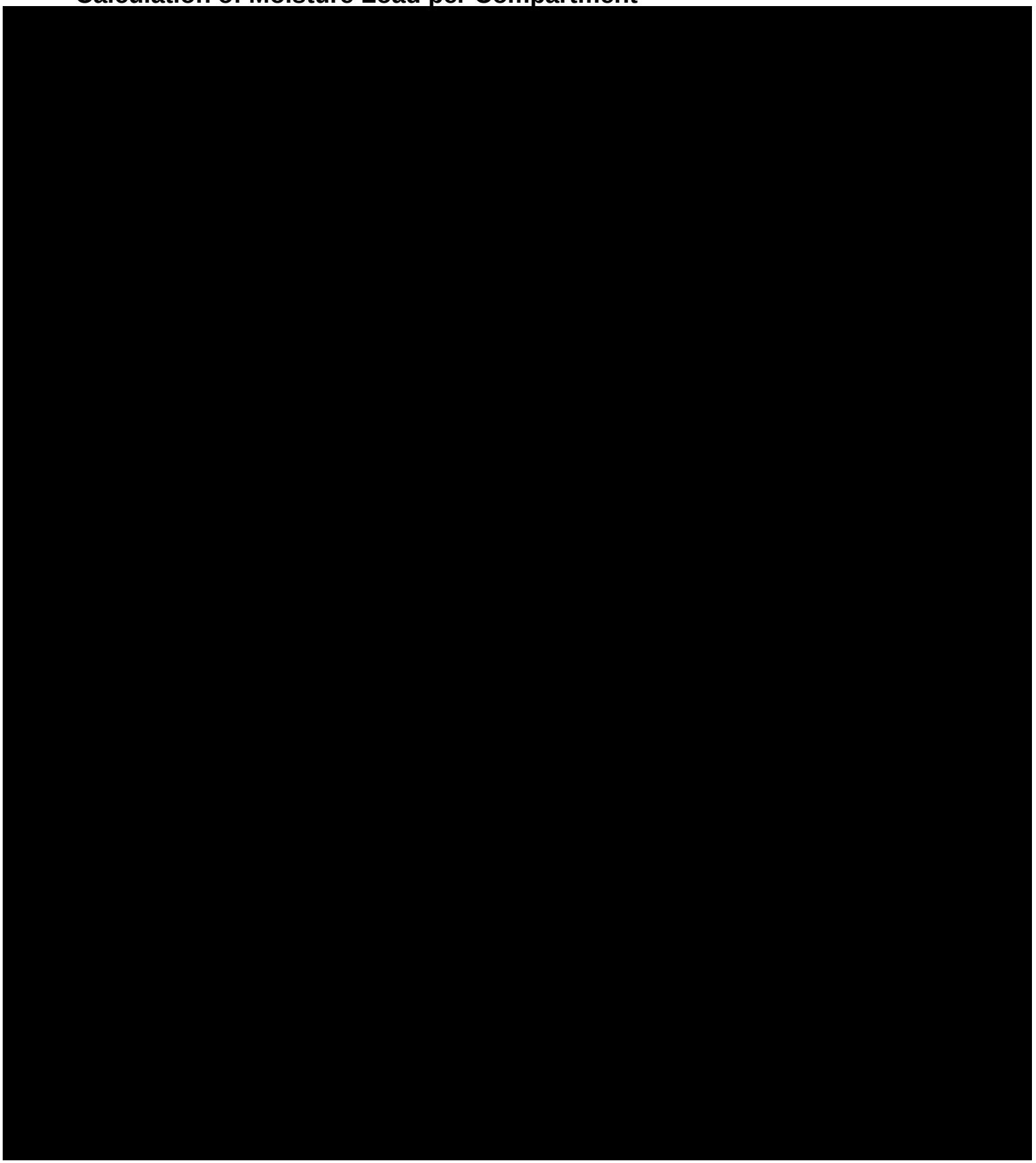
For the purpose of testing and rating, the Ambient (75^{O}F) compartment is treated as a Medium (Refrigerator at 75^{O}F) compartment. All volume and energy consumption calculations will be included within the Medium (Refrigerator 38^{O}F) category and summed with other Medium (Refrigerator 38^{O}F) compartment/s.

Below is a list of testing requested variations, with justification, to the current DOE test procedure for remote, solid door cabinet models. These variations allow evaluation of the basic models in a process more representative of the "true" energy consumption.

Test Condition/s or Calculation/s	DOE Remote Solid Door Cabinet Test Procedure	Traulsen Proposed Innopod Test Procedure[6]	Justification for Change
Test Method	ASHRAE 72-2014, Section 7 Test Procedure	**"Inverse Refrigeration Load" test, See Appendix - F** Allows energy (Heat) loss at a rate and delta-T equivalent to energy gains of a standard refrigerated cabinet.	Eliminates the implications associated with capillary tube refrigeration system testing. Capillary tubes cannot be used with a "typical" remote refrigeration system and the fixture described in the test procedure.
Ambient	Dry Bulb: 75.2^{O}F ±1.8^{O}F Wet Bulb: 64.4^{O}F±1.8^{O}F	Dry Bulb: 75.2^{O}F ±1.8^{O}F **Dew Point: 58.3^{O}F ±1.8^{O}F**	Reflects a test condition where the moisture content of the ambient air is held constant. Both are primary measurements.
Integrated Average Temperature (IAT)Simulated Product vs. Test Ambient Delta-T	Refrigerator: 38^{O}F ± 2^{O}F Freezer 0^{O}F ±2^{O}F Inside / Outside / Delta-T 38^{O}F / 75.2^{O}F / 37.2^{O}F 0^{O}F / 75.2^{O}F / 75.2 ^{O}F *Heat - GAIN*	Refrigerator: (*75.2^{O}F + 75.2^{O}F – 38^{O}F*) = **112.4^{O}F ±2^{O}F** Freezer: (*75.2^{O}F + 75.2^{O}F – 0^{O}F*) = **150.4^{O}F ±2^{O}F** **Ambient: (75.2^{o}F + 75.2^{o}F - 75^{o}F) = 75.4 ^{o}F ±2^{o}F** Inside / Outside / Delta-T Refrigerator: 112.4^{O}F / 75.2^{O}F / 37.2^{O}F Freezer: 150.4^{O}F / 75.2^{O}F / 75.2 ^{O}F Ambient: 75.04^{O}F / 75.2^{O}F / 0.4^{O}F *Heat – LOSS = Heat – GAIN as proscribed in the test procedure*	Reflects a test condition where the (Delta "T"I between the IAT and ambient air is held constant. Introduces a new "Lowest Applicable Product Temperature" of 0^{O}F75^{O}F for cavity operating temperature range of "Ambient". This range shall be treated as a refrigerator for energy calculation purposes. VCS.RC.M
Door-Opening Requirement	Starts 3 hours after defrost for 6 seconds, every 10 minutes, for 8 consecutive hours, per door. (48 cycles)	**Door openings shall start 3 hours after concluding stabilization period. Open each door for 8 seconds, every 2 hours, for 12 consecutive hours. (6 door cycles) (3 "load" and "unload" cycles)** > Stock (load) + Retrieve (un-load) = Cycle (turn)	Timing reflects actual usage as a general grocery [redacted] >3 turns per day (load & un-load) >Each turn equals 4 hours
Calculation of Refrigeration Load ASHRAE 72-2014	Total energy removed divided by the running time. Q = (hi – ho) x ^{O}F = (BTU/Hr.) t(Hr.) "energy removed" all sources	Total energy added divided by the total test time. **"Inverse Refrigeration Load"** **Q = Win (watt) * 3.412 (BTU/Watt) = (BTU/Hr.)** **t (Hr.)** Provides the "energy removed" by infiltration.	Measuring the amount of heat required by the compartment to maintain its desired temperature across an insulation barrier at a constant delta-T yields the "Refrigeration Load" by infiltration.
Adjusted Dew Point & EER AHRI 1200-2013 Table 1, EER	D.P.: The average measured "Saturated Vapor Temp." of the refrigerant during the "Last ¾ of the Running Cycle" as it leaves the cabinet. A.D.P.: Med. Temp. = D.P. – 2^{O}F A.D.P.: Low Temp. = D.P. – 3^{O}F	**Dew Point (D.P.): Derived from standard industry design practices**, "as the customary saturated vapor temperature of the refrigerant as it leaves the cabinet through the suction line." The Energy Efficiency Ratio is then taken from this value using Table 1. **EER** **A.D.P.: Med. Temp. = (D.P.: +15^{O}F) – 2^{O}F = +13^{O}F 11.22** **A.D.P.: Low Temp. = (D.P.: -20^{O}F) – 3^{O}F = -23^{O}F 6.60**	The "Inverse Refrigeration Load" test does not allow for the direct measurement of the saturated suction pressure (Saturated Vapor Temp.), therefore the Dew Point value must be taken from standard industry practices at the applicable compartment operating temp.
Calculated Daily Energy Consumption AHRI 1201-2013	Part 1: Calculation of CEC CEC = [(Q x t) / 1000] / EER >"Q" includes waste heat from: * Evaporator Fan/s * Anti-Condensate Heater/s * Defrost Heater/s Part 2: Calculation of CDEC CDEC = CEC + FEC + AEC + DEC	**Part 1: REVISED, Calculation of CEC** **CEC = [(Q x t) / 1000 + (FEC + AEC + DEC) *3.412] / EER** **>"Q" does NOT include waste heat from auxiliary components and moisture infiltration (must be added separately).** * FEC: Evaporator Fan/s * AEC: Anti-Condensate Heater/s * DEC: Defrost Heater/s Part 2: *Current,* Calculation of CDEC CDEC = CEC + FEC + AEC + DEC	The "Inverse Refrigeration Load" test does not include waste heat from auxiliary components located within the refrigerated storage compartment and the calculated moisture infiltration from the "Door – Opening Requirement". This "Heat Load" must be added separately before the EER is applied to the Total Refrigeration Load when calculating the CEC.

[6] See Annex E for additional information

Calculation of Moisture Load per Compartment



1 Calculate volume of each compartment

Unit # -	Width (in)	Depth (in)	Height (in)	Volume (cu-ft)

[redacted]

Calculation Methodology

2 Calculate free air space in each compartment at a 70% product load factor. (cu-ft) [redacted]

3 compartment per door opening when cabinet is operating at actual conditions. Assume 100% 0f 30% (lbs) [redacted] =

[redacted]

4 Calculate final **Enthalpy** "Energy" of compartment air when operating at actual (Dry Bulb/Dew Point) conditions. Assume 100% of 30% for volume (BTU) [redacted] =

[redacted]

5 Calculate entering **Enthalpy** "Energy" of room air entering compartment. Assume weight of air is equal to 100% of the 30% excess volume. (BTU) [redacted]

[redacted]

6 Calculate final **Enthalpy** "Energy" of compartment air when operating at test (Dry Bulb/Dew Point) conditions. Assume 100% of 30% for volume (BTU) [redacted]

[redacted]

7 [redacted]

8 Calculate moisture Load on Interior surfaces not accounted for during testing. [redacted]

[redacted]

9 door opening (freezer compartment) from the ambient air not accounted for during testing. Moisture Loading. (BTU) [redacted]

[redacted]

BASIC MODEL NUMBERS WHICH THE WAIVERS ARE BEING REQUESTED FOR:

The test procedure described in this waiver shall be used on the following possible basic model configurations.

See Annex A for model configuration information.

MODEL	[redacted]	[redacted]	[redacted]	[redacted]
30-	XX-	X(x)-	3 (x)-	XXX
			4 (x)-	XXXX
			5 (x)-	XXXXX
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

LIST OF MANUFACTURERS OF ALL OTHER BASIC MODELS MARKETED IN THE UNITED STATES AND KNOWN TO THE PETITIONER TO INCORPORATE SIMILAR DESIGN CHARACTERISTIC(S)

Traulsen has reviewed the CCMS database as of 12/20/2016 to review all known listed products and found that there are no listed models covered by the DOE requirements that have design characteristics similar to that on which our relief petition is based.

Traulsen has also done a number of web searches [redacted] which has not shown any covered products with similar design characteristics to be available in the U.S. However, there are several "refrigerated" [redacted] that we found available and installed in markets outside of the United States. This type of product is not currently energy regulated in those countries, nor is it subject to the strenuous NSF standards for food safety, allowing them to be designed without energy usage constraints. [redacted]

Therefore, Traulsen does not believe that there are other known manufacturers in which to provide concurrent notice of this Petition for Waiver and Application for Interim Wavier.

SUCCESS OF THE PETITION/ APPLICATION FOR THE WAIVER WILL:

[redacted] this product represents an innovative way to provide short-term holding of the customer grocery orders in locations that are convenient and assure greater product safety due to the ability of the store to control and monitor the cold food chain of the customer's grocery order.

Allowing Traulsen to perform testing using the proposed alternate method will allow us to report valid energy usages more representative of the product's design and prove compliance with applicable DOE 2017 Energy Conservation standards. In addition, the waiver will provide the opportunity for the company to review the performance of the product in real time uses and assess it for future innovations [redacted]

WHAT ECONOMIC HARDSHIPS AND/ OR COMPETITIVE DISADVATAGE IS LIKELY TO RESULT ABSENT A FAVORABLE DETERMINATION OF THE PETITION/ APPLICATION OF WAIVER

[redacted] A denial of this petition will not only affect Traulsen but an entire chain of suppliers, customers and end-users with an economic stake in the research attached to Innopod's introduction.

Because the innovative, custom design nature of this product [redacted] Traulsen has had long lead times and has made a significant investment associated with designing these products for the U.S. market, including the necessary compliance obligations related to safety, sanitation, and energy usage. Absence of the waivers will mean that [redacted] exposing the company to substantial economic hardship and potential legal liability.

CONCLUSION

It is clear that the law requires covered commercial refrigeration products to be tested and certified using the test procedure set forth at 10 C.F.R. Pt 431, Subpt. C, Sec. 431.64 – or **be subject to a waiver** – before they are sold into commerce. DOE's current test procedure references ARI Standard 1200-2006 and AHRI Standard 1200 (I-P)-2010 which further references ANSI/ASHRAE Standard 72. However, these current test procedures simply do not contemplate the unique operating characteristics of the Innopod [redacted] as described herein.

Because the specific design of this product contains one or more design characteristics noted in the waiver, Traulsen believes that this petition and its combined application meets both conditions of 10 CFR 431.401(a) (1) for granting waivers, on the grounds that:

1. The petitioner's basic model contains one or more design characteristics that prevent testing according to the prescribed test procedures; and
2. The prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy consumption as to provide materially inaccurate comparative data;

Therefore, Traulsen respectfully requests that the Department grant both the above Petition for Waiver and the Application of Interim Waiver, allowing Traulsen to move forward with the limited introduction into the U.S. market.
If we can provide further information, or if it would be helpful to discuss any of these matters further, please contact us at your earliest convenience.

Thank you in advance for your consideration and prompt response.

Sincerely,

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