[6450-01-P]

DEPARTMENT OF ENERGY

10 CFR Parts 429 and 431

[Docket No. EERE-2016-BT-TP-0030]

RIN 1904-AD72

Energy Conservation Program: Test Procedure for Walk-in Coolers and Walk-in Freezers

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

ACTION: Final rule.

SUMMARY: This final rule amends the test procedure for certain walk-in cooler and freezer components by improving the procedure's clarity, updating related certification and enforcement provisions to address the performance-based energy conservation standards for walk-in cooler and freezer equipment, and establishing labeling requirements to aid manufacturers in determining compliance with the relevant standards for walk-in cooler and freezer applications. The amendments consist of provisions specific to certain walk-in cooler and freezer refrigeration systems, including product-specific definitions, removal of a performance credit for hot gas defrost, and a method to accommodate refrigeration equipment that use adaptive defrost and on-cycle variable-speed evaporator fan control.

DATES: The effective date of this rule is **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. The final rule changes will be mandatory for representations starting **[INSERT DATE 180 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**. The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register on [**INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER**].

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

A link to the docket web page can be found at www.regulations.gov/#!docketDetail;D=EERE-2016-BT-TP-0030. The docket web page will contain simple instructions on how to access all documents, including public comments, in the docket.

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SUPPLEMENTARY INFORMATION:

DOE incorporates by reference the following industry standards into 10 CFR part 431:

1) AHRI Standard 420-2008 ("AHRI 420-2008"), "Performance Rating of Forced-Circulation Free-Delivery Unit Coolers for Refrigeration," copyright 2008.
2) AHRI Standard 1250-2009 ("AHRI 1250-2009"), "Standard for Performance Rating of Walk-in Coolers and Freezers," approved 2009.
3) ASHRAE Standard 23.1-2010 ("ASHRAE 23.1-2010"), "Methods of Testing for Rating the Performance of Positive Displacement Refrigerant Compressors and Condensing Units that Operate at Subcritical Temperatures of the Refrigerant," ANSI approved January 28, 2010.
4) ASTM C518-04 ("ASTM C518"), Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus, approved May 1, 2004.

Copies of AHRI Standard 420-2008 and AHRI Standard 1250-2009 may be purchased from AHRI at 2111 Wilson Boulevard, Suite 500, Arlington, VA 22201, or by going to www.ahrinet.org.

Copies of ASHRAE 23.1-2010 may be purchased from ASHRAE at 1971 Tullie Circle NE., Atlanta, GA 30329, or by going to www.ashrae.org.

Copies of ASTM C518 may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, (610) 832-9500.

For a further discussion of these standards, see section IV.N.

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I. Authority and Background

Walk-in coolers and walk-in freezers (collectively, “walk-ins” or “WICFs”) are included in the list of “covered equipment” for which the U.S. Department of Energy (“DOE”) is authorized to establish and amend energy conservation standards and test

procedures. (42 U.S.C. 6311(1)(G)) By definition, a walk-in is an enclosed storage space of less than 3,000 square feet that can be walked into and is refrigerated to prescribed temperatures based on whether the given unit is a cooler or a freezer. See generally 42 U.S.C. 6311(20). In simple terms, a walk-in is an insulated box (or envelope) serviced by a refrigerated system that feeds cold air to the box's interior. DOE's energy conservation standards and test procedures for walk-ins are currently prescribed at 10 CFR 431.306 and 10 CFR 431.304, respectively. The following sections discuss DOE's authority to establish test procedures for walk-ins and relevant background information regarding DOE's consideration of test procedures for this equipment.

A. Authority

Title III, Part C[1] of the Energy Policy and Conservation Act of 1975 ("EPCA" or, in context, "the Act"), Public Law 94-163, as amended (codified as 42 U.S.C. 6311-6317) established the Energy Conservation Program for Certain Industrial Equipment, a program covering certain industrial equipment, including walk-ins, the subject of this document. (42 U.S.C. 6311(1)(G))

In general, this program addresses the energy efficiency of certain types of commercial and industrial equipment. Relevant provisions of the Act specifically include definitions (42 U.S.C. 6311), energy conservation standards (42 U.S.C. 6313), test procedures (42 U.S.C. 6314), labeling provisions (42 U.S.C. 6315), and the authority to

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

require information and reports from manufacturers (42 U.S.C. 6316 and 6296(d)). Manufacturers of covered equipment must use the prescribed DOE test procedure as the basis for making representations to the public regarding the energy use or efficiency of such equipment. (42 U.S.C. 6314(d))

Under 42 U.S.C. 6314, EPCA sets forth the criteria and procedures DOE must follow when prescribing or amending test procedures for covered products. EPCA provides in relevant part that any test procedures prescribed or amended under this section shall be reasonably designed to produce test results that measure the energy efficiency, energy use or estimated annual operating cost of a covered product during a representative average use cycle or period of use and shall not be unduly burdensome to conduct. See 42 U.S.C. 6314(a)(2) (detailing criteria for setting test procedures for industrial equipment).

DOE also generally periodically reviews its test procedures and if it determines that an amendment is warranted, DOE publishes a proposal to amend them and offers the public an opportunity to present oral and written comments on that proposal. (See generally 42 U.S.C. 6314(b)) DOE also generally determines the extent, if any, to which the test procedure amendment(s) would alter the measured energy efficiency of any covered product as determined under the existing test procedure. (42 U.S.C. 6293(e)(1)) For purposes of this rulemaking, DOE has made this determination through its conducting of a parallel rulemaking setting standards for certain classes of walk-in refrigeration systems.

B. Background

Section 312 of the Energy Independence and Security Act of 2007, Public Law 110-140 (December 19, 2007), required DOE to establish test procedures to measure walk-in energy use. On April 15, 2011, DOE published test procedures for the principal components that make up a walk-in: panels, doors, and refrigeration systems. DOE took this component-based testing approach after carefully considering a significant body of feedback from interested parties that requiring a single test procedure for an entire walk-in would be impractical because most walk-ins are assembled on-site with components from different manufacturers. 76 FR 21580, 21582 (April 15, 2011).

On February 20, 2014, DOE initiated another test procedure rulemaking for walk-ins to clarify and modify the test procedures published in April 2011. DOE also proposed to revise the existing regulations for walk-ins to allow manufacturers, once certain qualifications are met, to use an alternative efficiency determination method ("AEDM") to certify compliance and report ratings. That effort, which came in the form of a supplemental notice of proposed rulemaking ("SNOPR"), solicited public comments, data, and information on the proposed test procedure modifications. 79 FR 9818 (February 20, 2014). DOE published a final rule codifying the AEDM provisions and amendments to the test procedure for walk-ins on May 13, 2014. 79 FR 27388.

DOE also published a notice of proposed rulemaking ("NOPR") to establish new performance-based energy conservation standards for walk-ins on September 11, 2013. ("September 2013 NOPR") 78 FR 55782. That NOPR addressed the comments received during earlier stages of the rulemaking and proposed new energy conservation standards

for this equipment. In conjunction with the September 2013 NOPR, DOE published a technical support document ("TSD") to accompany the proposed rule along with spreadsheets addressing aspects of DOE's engineering analysis, Government Regulatory Impact Model ("GRIM"), life cycle cost ("LCC"), and national impact analysis ("NIA"). See Docket No. EERE-2008-BT-STD-0015. DOE proposed standards for eight dedicated condensing classes of refrigeration systems, two multiplex condensing classes of refrigeration systems, three classes of panels, four classes of non-display doors, and two classes of display doors. (The proposed refrigeration system standards used the metric "annual walk-in energy factor" ("AWEF"), and the door standards used the metric maximum energy consumption that incorporates thermal insulating ability and electrical energy used by the door. The proposed panel standards were equivalent to those previously established by Congress and use a measurement of thermal insulation—or "R-value"—to represent the energy efficiency of these components.) DOE published a final rule adopting these new standards on June 3, 2014 ("June 2014 final rule"). 79 FR 32050. Except for the equipment class standards that were vacated, as described below, compliance with the standards adopted in the June 2014 final rule is required starting on June 5, 2017.

After publication of the June 2014 final rule, the Air-Conditioning, Heating and Refrigeration Institute ("AHRI") and Lennox International, Inc. (a manufacturer of walk-in refrigeration systems) filed petitions for review of DOE's final rule and DOE's subsequent denial of a petition for reconsideration of the rule (79 FR 59090 (October 1, 2014)) with the United States Court of Appeals for the Fifth Circuit. *Lennox Int'l v. Dep't of Energy*, Case No. 14-60535 (5th Cir.). Other walk-in refrigeration system

manufacturers — Rheem Manufacturing Co. (owner of Heat Transfer Products Group) and Hussmann Corp. — along with the Air Conditioning Contractors of America (a trade association representing contractors who assemble walk-in refrigeration systems) intervened on the petitioners' behalf, while the Natural Resources Defense Council ("NRDC")—representing itself, the American Council for an Energy-Efficient Economy, and the Texas Ratepayers' Organization to Save Energy—intervened on behalf of DOE. As a result of this litigation, a settlement agreement was reached that addressed, among other things, six of the refrigeration system standards—the standards for low-temperature dedicated condensing equipment classes and both medium- and low-temperature multiplex condensing equipment classes.

A controlling Order from the United States Court of Appeals for the Fifth Circuit, issued on August 10, 2015, vacated those six standards. On November 12, 2015, DOE amended the CFR to reflect this Order. 80 FR 69837. The remaining standards promulgated by the June 2014 final rule—i.e., the (1) four standards applicable to dedicated condensing refrigeration systems operating at medium-temperatures, (2) three standards applicable to panels, and (3) six standards applicable to doors— were not vacated and continue to remain subject to the June 5, 2017 compliance date prescribed in the June 2014 final rule. See 79 FR at 32051-32052 (Table I.1) and 32123-32124 (codified at 10 CFR 431.306(a), (c)-(e)).

To address the vacated standards, DOE established a Working Group to negotiate proposed energy conservation standards to replace them. Specifically, on August 5, 2015, DOE published a notice of intent to establish a Working Group for Certain Equipment

Classes of Refrigeration Systems of Walk-in Coolers and Freezers to Negotiate a Notice of Proposed Rulemaking for Energy Conservation Standards ("Working Group"). 80 FR 46521. The Working Group was established under the Appliance Standards and Rulemaking Federal Advisory Committee ("ASRAC") in accordance with the Federal Advisory Committee Act ("FACA") and the Negotiated Rulemaking Act ("NRA"). (5 U.S.C. App. 2; 5 U.S.C. 561-570, Public Law 104-320.) The purpose of the Working Group was to discuss and, if possible, reach consensus on proposed standard levels for the energy efficiency of the affected classes of walk-in refrigeration systems. The Working Group consisted of 12 representatives of parties having a defined stake in the outcome of the proposed standards and one DOE representative (see Table 1). All of the meetings were open to the public and broadcast via webinar. Several people who were not members of the Working Group attended the meetings and were given the opportunity to comment on the proceedings. Non-Working Group meeting attendees are listed in Table 2. The Working Group consulted as appropriate with a range of experts on technical issues. The Working Group met in-person on 13 days of meetings held between August 27 and December 15, 2015.

Table 1 Walk-in Refrigeration Systems Negotiated Rulemaking Working Group

Full Name	Affiliation
Ashley Armstrong	U.S. Department of Energy.
Lane Burt	Natural Resources Defense Council.
Mary Dane	Traulsen.
Cyril Fowble	Lennox International, Inc.
Sean Gouw	CA Investor-Owned Utilities.
Andrew Haala	Hussmann Corp.
Armin Hauer	ebm-papst, Inc.
John Koon	Manitowoc Company.
Joanna Mauer	Appliance Standards Awareness Project.
Charlie McCrudden	Air Conditioning Contractors of America.
Louis Starr	Northwest Energy Efficiency Alliance.
Michael Straub	Rheem Manufacturing.
Wayne Warner	Emerson Climate Technologies.

Table 2 Other ASRAC Walk-In Coolers and Freezers Meeting Attendees and Affiliations

Full Name	Affiliation
Akash Bhatia	Tecumseh Products Company
Bryan Eisenhower	VaCom Technologies
Dean Groff	Danfoss
Brian Lamberty	Unknown
Michael Layne	Turbo Air
Jon McHugh	McHugh Energy
Yonghui (Frank) Xu	National Coil Company
Vince Zolli	KeepRite Refrigeration

On December 15, 2015, the Working Group reached consensus on, among other things, a series of energy conservation standards to replace those that were vacated as a result of the litigation. The Working Group assembled their recommendations into a single Term Sheet (See Docket EERE-2015-BT-STD-0016, No. 56) that was presented to, and approved by, the ASRAC on December 18, 2015. DOE anticipates adopting in a separate rulemaking document energy conservation standards consistent with the Working Group's Term Sheet for those classes of walk-in refrigeration systems whose

standards were vacated. See Docket No. EERE-2015-BT-STD-0016 for all background documents on the negotiated rulemaking.

While the Working Group's focus centered primarily on addressing the six energy conservation standards for low-temperature dedicated condensing equipment classes and both medium- and low-temperature multiplex condensing equipment classes, (see Docket No. EERE-2015-BT-STD-0016, No. 1 and 2), the Term Sheet also included recommendations that DOE consider making certain amendments to the walk-in test procedure. These recommendations included technical corrections to the test procedure itself, definitions for certain terms to provide clarity regarding the applicability of the standards (and, relatedly, the test procedure), and other changes that the Working Group deemed necessary in order to implement the agreed-upon refrigeration system standards.[2] DOE considered the approved Term Sheet, along with other comments received during the negotiated rulemaking process, and proposed several test procedure amendments addressing these Term Sheet recommendation in a NOPR published August 17, 2016 ("August 2016 NOPR"). 81 FR 54926. The NOPR also included additional proposals to facilitate implementation of energy conservation standards for WICF components. DOE held a public meeting to discuss the NOPR on September 12, 2016 and accepted written

[2] The recommended changes to the test procedure deal exclusively with efficiency measurement and certification for the classes of refrigeration systems that were the subject of the negotiations. These changes do not affect the test procedures for the refrigeration system standards that were not vacated. They specifically address removing test procedure provisions, including hot gas defrost, and adding requirements that certified efficiency levels for evaluating standards compliance would not rely on the current test procedure provisions for adaptive defrost or on-cycle variable-speed evaporator fans.

comments during a comment period that ended October 17, 2016. DOE considered these comments when developing this final rule.

DOE is requiring manufacturers to use the prescribed test procedure described in this document when making representations regarding the energy use or efficiency of covered equipment. Manufacturers will have 180 days after the final rule's publication date to ensure that these representations are based on this test procedure. (42 U.S.C. 6314(d))

The amendments adopted in this final rule will not change the measured energy use of the classes of refrigeration systems whose standards were not vacated.[3] As such, all test procedure amendments adopted in this final rule are effective 30 days after publication in the Federal Register and required for representations regarding the energy consumption of covered equipment 180 days after publication of this final rule in the Federal Register. The compliance dates for labeling requirements are aligned with the corresponding energy conservation standards compliance dates, i.e., June 2017 for the standards established by the June 2014 final rule that were not vacated, and January 2020 for the refrigeration system standards for unit coolers and low-temperature dedicated condensing units.

In addition to implementing the recommendations detailed in the Term Sheet developed as part of the ASRAC negotiated rulemaking meetings, this final rule fulfills

[3] DOE anticipates adopting performance-based energy conservation standards for certain classes of refrigeration systems for walk-ins in a separate rulemaking—those standards would replace the standards vacated by the Fifth Circuit court order. See Docket No. EERE-2015-BT-STD-0016.

DOE's obligation to periodically review its test procedures under 42 U.S.C. 6314(a). DOE also reviewed other aspects of the WICF test procedure and ultimately concluded that, with the exception of the amendments being made in this final rule, no other changes are needed at this point in time. DOE anticipates that its next evaluation of this test procedure (and the addressing of any remaining issues detailed in the Term Sheet that relate to the WICF test procedure) will occur in a manner consistent with this provision. (Term Sheet at EERE–2015–BT–STD–0016, No. 56, Recommendation #6)

II. Synopsis of the Final Rule

In this final rule, DOE amends 10 CFR 431.304, "Uniform test method for the measurement of energy consumption of walk-in coolers and walk-in freezers," and related certification, compliance, and enforcement provisions of 10 CFR 429. The amendments fall into two groups.

The first group consists of test procedure modifications and other additions to the regulatory text recommended by the Working Group and listed in the Term Sheet, including the following:

(1) Adding definitions for the terms "dedicated condensing unit," "outdoor dedicated condensing refrigeration system," "indoor dedicated condensing refrigeration system," "adaptive defrost," "process cooling," and "refrigerated storage space." DOE also is adding definitions for "dedicated condensing refrigeration system," "single-package dedicated system," "matched condensing unit," "matched refrigeration system,"

and modifying the definition of “refrigeration system” to complete a comprehensive structure for defining all relevant terms discussed in the test procedure.

(2) Removing the method for calculating defrost energy and defrost heat load of a system with hot gas defrost and establish a method to test hot gas defrost refrigeration systems to obtain AWEF ratings equivalent to those of electric defrost refrigeration systems.

(3) Establishing a regulatory approach for refrigeration systems with adaptive defrost and/or on-cycle variable-speed evaporator fan control that requires that these features be deactivated when such units are tested to demonstrate compliance with the standard, while allowing for representations of their improved performance when using these features.

The second group of amendments consists of test procedure modifications and certification, compliance, and enforcement provisions that, while not part of the Term Sheet, are necessary for implementing the energy conservation standards. This group of changes includes the following:

(1) Re-organizing the test procedure provisions in 10 CFR 431.304 to improve clarity, and correct typographical errors in the rule language.

(2) Clarifying section 3.0 “Additional Definitions” in appendix A to subpart R of part 431.

(3) Modifying the current walk-in certification and reporting requirements in 10 CFR 429.53 to clarify applicability of walk-in test procedures to certain equipment classes and add provisions for reporting additional rating metrics.

(4) Adding walk-in refrigeration systems, panels, and doors to the list of products and equipment included as part of the enforcement testing requirements prescribed in 10 CFR 429.110(e)(2).

(5) Adding product specific enforcement provisions for walk-ins.

(6) Adding labeling requirements for walk-in refrigeration systems, panels, and doors.

III. Discussion

This final rule stems from the detailed discussions and suggestions offered by Working Group participants during the walk-in negotiated rulemaking. These participants, in addition to providing detailed technical feedback on replacing the vacated standards, also offered detailed recommendations regarding the walk-in test procedures. These recommendations were offered as a means to address questions related to the treatment of certain types of features or components that may be present in a given walk-in refrigeration system. DOE developed specific proposals to incorporate the Working Group recommendations into its test procedures, resulting in the August 2016 NOPR. 81 FR 54926. DOE received comments from a number of interested parties. A list of these

parties is included in Table 3 -- Interested Parties Who Commented on the WICF NOPR. The comments received and DOE's decisions regarding finalization of the test procedure amendments are discussed in the sections that follow.

Table 3 -- Interested Parties Who Commented on the WICF NOPR

Commenter	Acronym	Affiliation	Comment Number (Docket Reference)[1]
Air-Conditioning, Heating, and Refrigeration Institute	AHRI	Trade Association	11, 23
American Panel Corporation	APC, American Panel	Manufacturer	7, 23
Appliance Standards Awareness Project and Northwest Energy Efficiency Alliance	ASAP and NEEA	Efficiency Organizations	19
Bally Refrigerated Boxes, Inc.	Bally	Manufacturer	22, 23
California Investor Owned Utilities	CA IOUs	Utility Association	21
CrownTonka	CrownTonka	Manufacturer	23
Dow Chemical Company	Dow	Component/Material Supplier	9
Emerson Climate Technologies	Emerson	Manufacturer	*
EPS Industry Alliance	EPS-IA	Trade Association	12
Heat Controller Inc.[2]	Heat Controller	Manufacturer	23
Hussmann Corporation	Hussmann	Manufacturer	20, 23
Imperial Brown Inc.	IB	Manufacturer	23
KeepRite Refrigeration	KeepRite	Manufacturer	17
KPS Global LLC	KPS	Manufacturer	8
Lennox International, Inc. and Heatcraft Refrigeration Products, LLC	Lennox	Manufacturer	13, 23
Manitowoc Company	Manitowoc	Manufacturer	10
National Coil Company	NCC	Component/Material Supplier	16, 23
North American Association of Food Equipment Manufacturers	NAFEM	Trade Association	14
Panasonic Corporation	Panasonic	Manufacturer	*
Rheem Manufacturing Company and Heat Transfer Products Group, LLC	Rheem	Manufacturer	18, 23
Ron Shebiu	Shebiu	Individual	*
U.S. Department of Health and Human Services, Office of Inspector General	DHHS OIG	Federal Agency/Association	*
The Delfield Company	Delfield	Manufacturer	*
Zero Zone, Inc.	Zero Zone	Manufacturer	15

Notes:

1. Comment number 23 indicates the party commented during the public meeting.
2. This commenter is listed as Roxanne Scott in the public meeting transcript.
*These commenters were present at the public meeting but did not make comments at the meeting or submit written comments.

A. Actions in Response to ASRAC Negotiated Terms

1. Definitions

The Working Group recommended that DOE define the terms "dedicated condensing unit," "matched condensing unit," and "outdoor condensing unit" (Term Sheet at EERE–2015–BT–STD–0016, No. 56, Recommendation #1); "adaptive defrost" (Term Sheet at EERE–2015–BT–STD–0016, No. 56, Recommendation #2); and "process cooling," "preparation room refrigeration," and "storage space." (Term Sheet at EERE–2015–BT–STD–0016, No. 56, Recommendation #7) DOE sought to define these terms to more clearly identify the categories of equipment that are covered and to clarify the application of the test procedures and standards to these equipment. To this end, DOE proposed definitions for these terms along with several others, notably, the terms "dedicated condensing refrigeration system," "outdoor dedicated condensing refrigeration system," "indoor dedicated condensing refrigeration system," "matched refrigeration system," "unit cooler," and "packaged dedicated system." These supplemental definitions were developed to help enhance the clarity of the walk-in regulatory framework and to assist manufacturers in readily ascertaining how to classify (and certify for compliance purposes) the myriad of refrigeration systems they produce. Finally, DOE proposed to modify the current definition of "refrigeration system" to align it more closely with the terminology being defined. See 81 FR at 54929-54932. The following sections discuss the proposed definitions and comments received from stakeholders regarding the

proposals. The precise text for the final definitions, which will all appear in 10 CFR 431.302, is contained in the regulatory text appearing at the end of this document.

a. Dedicated Condensing Unit and Dedicated Condensing Refrigeration System

DOE proposed to define the dedicated condensing equipment class to address three refrigeration system configurations – (1) a dedicated condensing unit; (2) a packaged dedicated system; and (3) a matched refrigeration system. DOE proposed defining what a dedicated condensing refrigeration system is to clarify the scope of this equipment class. Consistent with Lennox's assertion that single-package refrigeration systems are a type of dedicated condensing system (Docket No. EERE-2015-BT-STD-0016, DOE and Lennox, Public Meeting Transcript (October 16, 2015), No. 63 at pp. 249-251), DOE proposed to include this configuration in the proposed definition. DOE also proposed that a matched condensing system—consisting of a dedicated condensing unit that is distributed in commerce with one or more specific unit coolers—would also be treated as a dedicated condensing system. Finally, DOE also proposed to treat as a dedicated condensing system a dedicated condensing unit sold separately from any unit cooler. This proposed clarification underpins DOE's certification approach of allowing manufacturers to test and rate condensing units separately when certifying compliance with the dedicated condensing standard, without having to distribute their condensing units in commerce with one or more specific unit coolers. 81 FR at 54929-54930.

DOE's proposed definition for "dedicated condensing unit" reflected each of these elements. Under the proposed definition, such a unit would be a positive displacement condensing unit that is part of a refrigeration system (as defined in 10 CFR

431.302) and is an assembly that (1) includes 1 or more compressors, a condenser, and one refrigeration circuit and (2) is designed to serve one refrigerated load. The term "factory-made" was omitted from the proposed definition to avoid suggesting that such an assembly is not a condensing unit (and thus not covered by DOE regulations) if it happens to be assembled from its subcomponents after shipment from the factory. Id.

Lennox, KeepRite, Rheem, ASAP and NEEA agreed with the proposed definition of "dedicated condensing unit." (Lennox, No. 13 at p. 6; KeepRite, No. 17 at p. 1; Rheem, No. 18 at p. 2; ASAP and NEEA, No. 19 at p. 1)

DOE did not receive any opposing comments regarding its proposed definition for "dedicated condensing unit." Accordingly, DOE is adopting this definition as proposed.

Additionally, DOE proposed to define "dedicated condensing refrigeration system" as referring to a (a) dedicated condensing unit, (b) packaged dedicated system, or (c) matched refrigeration system. 81 FR at 54930.

ASAP and NEEA supported this proposed definition. (ASAP and NEEA, No. 19 at p. 1) Others, however, challenged the inclusion of packaged dedicated systems within the proposed definition (e.g., Rheem, No. 18 at p. 1). Comments addressing packaged dedicated systems are addressed in section III.A.1.b, including DOE's conclusion that these systems, which are being renamed as "single-package dedicated systems," fall within the dedicated condensing refrigeration system class. In finalizing this definition, DOE made no other changes.

b. Single-package Dedicated System

DOE proposed to treat a packaged dedicated system as a type of dedicated condensing refrigeration system. These systems are factory-assembled equipment where the components serving the compressor, condenser, and evaporator functions are "packaged" into a single piece of equipment. The system is then installed as part of a walk-in application, with the compressor and condenser located on the outside of the walk-in envelope (i.e., the boxed storage enclosure) and the evaporator on the inside. Walk-ins that use such a system include a hole in one of the walls or ceiling of the insulated enclosure into which the packaged system is mounted. The use of this equipment is necessarily limited to small-capacity walk-ins due to load-bearing limitations of the walk-in envelope. DOE proposed to define "packaged dedicated systems" by combining elements of the proposed definition for "dedicated condensing unit" (see section III.A.1.a) and the definition for "forced-circulation free-delivery unit cooler (unit cooler)" from AHRI-1250-2009. Consequently, DOE proposed to define a "packaged dedicated system" as "a refrigeration system (as defined in 10 CFR 431.302) that is a single-package assembly that includes one or more compressors, a condenser, a means for forced circulation of refrigerated air, and elements by which heat is transferred from air to refrigerant, without any element external to the system imposing resistance to flow of the refrigerated air." DOE did not include the term "factory-made" in the proposed definition for the same reasons that the term was omitted from the "dedicated condensing unit" definition, as explained earlier. See 81 FR at 54930-54931.

Rheem and American Panel commented that a "packaged dedicated system" leaves the factory as a complete system, with only power hookup and air inlet and outlet

to be configured on-site. Consequently, they suggested adding the clause "factory-assembled" to the definition for a packaged dedicated system. (Rheem, Public Meeting Transcript, No. 23 at pp. 19-21; American Panel, Public Meeting Transcript, No. 23 at p. 22)

Public meeting and written comments submitted to DOE from several manufacturers and AHRI indicated that there is no viable test procedure for packaged systems. Commenters requested that DOE clarify how to test and rate this equipment. The commenters pointed out the necessity of disassembling the unit to install mass flow meters and to install the evaporator and condenser sections in separate environmental chambers when testing packaged systems under the current test procedure. The commenters suggested that packaged systems should be exempt from the scope of the WICF standards because there is no test procedure for them. Further, Rheem, Manitowoc, and AHRI stated that it was their understanding from the ASRAC Working Group meeting that packaged systems do not fall within the definition of dedicated condensing unit, and are not subject to the dedicating condensing class standards. (Rheem, Public Meeting Transcript, No.23 at pp. 16-17; Lennox, Public Meeting Transcript, No.23 at p. 18; Manitowoc, No. 10 at pp. 3-4; Rheem, No. 18 at pp. 1-2; Hussmann, No. 20 at p. 1; AHRI, No. 11 at p. 6) The CA IOUs disagreed with manufacturers' claims that AHRI-1250-2009 is not an appropriate test procedure for packaged dedicated system WICF systems, noting that AHRI 1250-2009 specifically cites "integrated single package refrigeration units" as part of its scope. In addition, the CA IOUs recommended that DOE change the term, "packaged dedicated system," to "single-package dedicated system," or "self-contained units". (CA IOUs, No. 21 at pp. 2-3)

DOE notes that the definition for "refrigeration system" was established in the context of walk-ins to include "(1) [a] packaged dedicated system where the unit cooler and condensing unit are integrated into a single piece of equipment" in the April 15, 2011 final rule establishing test procedures for WICFs. 76 FR at 21605. In DOE's view, packaged systems are walk-in refrigeration systems and are subject to the applicable prescriptive standards established by Congress through EISA 2007 along with the performance standards that DOE prescribes for these systems.[4] DOE notes that this view is not restricted to DOE, as two manufacturers confirmed that a single-package refrigeration system is a type of dedicated condensing system on two occasions during the Working Group meetings. (Docket No. EERE-2015-BT-STD-0016; Lennox, Public Meeting Transcript (October 16, 2015), No. 63 at pp. 249-251; Rheem, Public Meeting Transcript (December 3, 2015), No. 57 at p. 157) Thus, DOE does not support the position that these systems are not considered to be WICF refrigeration systems subject to WICF standards, including the prescriptive standards mandated by EPCA.

DOE notes that section 2.1 of AHRI 1250-2009 describes the scope of this testing standard as applying "to mechanical refrigeration equipment consisting of an integrated single package refrigeration unit, or separate unit cooler and condensing unit sections, where the condensing section can be located either outdoor or indoor." The testing standard further explains that these controls "may be integral, or can be provided by a

[4] With respect to these prescriptive requirements, DOE notes that relevant statutory provision does not indicate that the promulgation of performance standards supplants those standards that Congress already mandated through its enactment of EISA 2007. Accordingly, because there is no explicit authority in this instance for DOE to override a statutorily-prescribed standard, the initial design requirements established by Congress continue to apply. See 42 U.S.C. 6313(f)(1)-(5) (detailing prescriptive design requirements for certain walk-in components and the process by which DOE must prescribe separate walk-in performance-based standards).

separate party as long as performance is tested and certified with the listed mechanical equipment accordingly." AHRI 1250-2009, section 2.1.

Further, the possibility that the equipment has one or more design characteristics that prevent testing according to the prescribed test procedures does not exempt manufacturers from coverage under the standards. DOE has established the waiver process to address such circumstances. See 10 CFR 431.401. While DOE acknowledges stakeholders' comments that the configurations of certain models of refrigeration systems may prevent testing according to the prescribed test procedures, manufacturers may avail themselves of the procedures under 10 CFR 431.401 to obtain a waiver that would enable them to test this equipment using an alternative test procedure. This process requires, among other things, that manufacturers include in a petition for waiver any alternate test procedures known to evaluate the performance of the equipment in a manner representative of the energy consumption characteristics of the basic model (10 CFR 431.401(b)(1)(iii)). The filing of the waiver does not exempt a manufacturer from compliance with standards or certification requirements. (10 CFR 431.401(a)(2))

In response to comments that "factory-assembled" should be part of the definition for single-package dedicated system, DOE notes that DOE omitted this clause from several of the definitions to avoid implying that a piece of equipment that otherwise meets the definition does not meet it if part of the assembly occurs outside a factory. An example of this is a refrigeration system that is shipped from the factory in multiple boxes and then assembled in the field. DOE agrees that it is likely that nearly all such single-package systems are fully assembled in a factory. However, DOE believes that

any such refrigeration system that is not fully assembled in a factory, for example, by having the condenser fan assembly mounted to the unit in the field, should still be considered a single-package refrigeration system and regulated under the relevant requirements under the dedicated condensing refrigeration system equipment class. Hence, DOE is not adopting the suggested change.

Regarding the CA IOUs' suggestion that the term "packaged dedicated system" be changed to "single-package dedicated system" for purposes of DOE's regulatory definitions, DOE surveyed manufacturer literature, and found that packaged dedicated systems are marketed as "Packaged Systems" or "Packaged Refrigeration Systems". (Master-Bilt product specification sheet, No.32 at p. 7; Lennox product catalog, No.31 at p. 190; and Rheem product specification, No.30) However, DOE believes that the suggested use of the term "single-package dedicated refrigeration system" would provide further clarity, indicating more precisely what this equipment is, and would be consistent with the approach already used for air-conditioning units. This consistency is significant since walk-in refrigeration systems are generally very similar in classification and operation to air conditioning systems. Accordingly, the use of the term "single-package" in the walk-in context would help clarify the categorization of this equipment and reduce the potential for industry and market confusion. To reduce the risk of confusion, DOE is adopting the suggested change from the CA-IOUs and is renaming the "packaged dedicated systems" category as "single-package dedicated refrigeration systems."

c. Matched Condensing Unit and Matched Refrigeration System

DOE proposed to define a "matched condensing unit" as "a dedicated condensing unit that is distributed in commerce with one or more unit cooler(s) specified by the condensing unit manufacturer." DOE also proposed to define "matched refrigeration system" (also called "matched-pair") as "a refrigeration system including the matched condensing unit and the one or more unit coolers with which it is distributed in commerce." 81 FR at 54931.

KeepRite supported the proposed definitions for matched condensing unit and matched refrigeration system. (KeepRite, No. 17 at p. 1) DOE did not receive any other comments regarding this definition and therefore is adopting it as proposed.

d. Outdoor and Indoor Dedicated Condensing Refrigeration Systems

DOE has established separate equipment classes for indoor and outdoor dedicated condensing refrigeration systems. See, e.g. 10 CFR 431.306(e) (breaking out dedicated condensing refrigeration system classes based on whether they are indoor/outdoor units and capacity). DOE proposed to define an "outdoor dedicated condensing refrigeration system" as a system that is encased and capable of maintaining a net capacity at the 35 °F outdoor temperature condition that is no less than 65 percent of the net capacity measured at the 95 °F outdoor temperature condition for a period of no less than one hour. See 81 FR at 54931. This approach differed from the WICF Term Sheet definition, which focused on a given unit's ability to operate in a 35 °F ambient condition – i.e., the unit "is capable of maintaining the medium temperature or low temperature DOE test procedure box conditions (as specified in 10 CFR Part 431.304) for an extended period at the 35 °F

outdoor temperature condition." (Term Sheet at EERE–2015–BT–STD–0016, No. 56, Recommendation #1) DOE explained that it modified this part of the definition to clarify the meaning of the phrases "maintaining the . . . box conditions" and "extended period." See 81 FR at 54931. DOE also proposed to define an "indoor dedicated condensing refrigeration system" as a system that is not an outdoor dedicated refrigeration system. See 81 FR at 54932.

Rheem and Lennox commented that 65 percent of net capacity at 95 °F would not be an effective metric for differentiating models. (Rheem, No. 18 at p. 2; Lennox, No. 13 at p. 6) Rheem further indicated that box load and condensing unit capacity are not the same and that as ambient temperature is lowered, the condensing unit capacity increases, which means overall capacity will be higher at a 65 °F ambient temperature than at a 95 °F ambient temperature. (Rheem, Public Meeting Transcript, No. 23 at pp. 24-25) Manitowoc, Rheem, Lennox, KeepRite and AHRI also suggested that the definition should reference existing test conditions from the test procedure rather than the proposed conditions – the use of which, some manufacturers suggested, has not been supported with substantiating data in the record. (Manitowoc, No. 10 at p. 4; Rheem, No. 18 at p. 2; Lennox, No. 13 at p. 6; KeepRite, No. 17 at p. 1; AHRI, No. 11 at p. 7)

AHRI, Manitowoc, Lennox, and Rheem supported the inclusion of "no less than one hour" in the proposed "outdoor dedicated condensing refrigeration system" definition. (AHRI, No. 11 at p. 7; Manitowoc, No. 10 at p. 4; Lennox, No. 13 at p. 6; Rheem, No. 18 at p. 2)

Finally, Manitowoc, Rheem, and AHRI also requested that the term "packaged dedicated systems" be removed from both the proposed definition and the test procedure. (Manitowoc, No. 10 at p. 4; Rheem, No. 18 at p. 2; AHRI, No. 11 at p. 7)

As addressed in section III.A.1.b, DOE considers the renamed "single-package dedicated systems" to be part of the dedicated condensing refrigeration system class, and does not agree with these commenters' suggestion to remove this category of equipment from the "outdoor" definition, since such units can be designed for outdoor use. Other than the name change for this equipment, which was discussed earlier in section III.A.1.b, the "outdoor dedicated condensing refrigeration system" definition adopted in this final rule retains this term.

NCC commented that some condensing units could be used with both outdoor and indoor applications. (NCC, Public Meeting Transcript, No. 23 at p. 26) Rheem commented that, because the outdoor requirements are more demanding, units that have passed outdoor certification testing should be able to apply for indoor certification without retesting. (Rheem, Public Meeting Transcript, No. 23 at p. 27) Heat Controller noted that often in the field a unit that is marketed and sold as an indoor unit will be fitted with an aftermarket weather covering and installed in an outdoor environment by a contractor. Heat Controller also commented that the manufacturer typically provides performance characteristics for its units at a range of ambient temperatures and installers will use these data to verify the unit's performance in an outdoor environment. (Heat Controller, Public Meeting Transcript, No. 23 at pp. 28-30) Rheem expressed concern about how DOE would enforce the regulation in this scenario, where a unit labeled and

certified for indoor use is installed in an outdoor environment. (Rheem, Public Meeting Transcript, No. 23 at pp. 30-31)

ASAP and NEEA noted that outdoor units have certain design options (e.g., floating head pressure control, variable-speed condenser fans, ambient sub-cooling) that allow them to perform more efficiently in outdoor environments. They argued that a test procedure that would permit a "loophole" allowing units designed and tested for indoor conditions to be used for outdoor applications would result in lost energy savings. ASAP and NEEA advocated creating a definition that prevents these "loopholes". (ASAP and NEEA, No. 19 at p. 2)

Hussmann noted that, given that some condensing units already in the market are sold for outdoor applications without an enclosure, the term "encased" should be removed from the proposed "outdoor dedicated condensing refrigeration system" definition. (Hussmann, No. 20 at p. 2) However, in light of the comments discussed above indicating that indoor units are often installed in outdoor applications, it is not clear whether this comment suggests that units designed for outdoor use do not have enclosures or whether it is confirming that indoor units are installed outdoors.

The CA IOUs commented that indoor units should be labeled for "indoor use only" to help contractors, building inspectors, and building owners verify that the equipment complies with standards. The CA IOUs also explained that since indoor units have less stringent AWEF requirements and are not designed to adjust to the wide fluctuations in outdoor temperature, they are generally less costly to purchase. They

speculated that this price difference could lead to increased energy consumption, incentivizing customers to buy less efficient, more affordable indoor units for outdoor applications. (CA IOUs, No. 21 at p. 4) ASAP and NEEA also encouraged DOE to consider whether labeling requirements and/or marketing restrictions could help prevent equipment certified for indoor use from being used in outdoor applications. (ASAP and NEEA, No. 19 at p. 2)

DOE notes that the industry comments recommended changing the definition to more closely adhere to the wording provided in the Term Sheet, particularly, "maintaining box conditions" with respect to the interior of the walk-in enclosure. (KeepRite, No. 17 at p. 1; Manitowoc, No. 10 at p. 4; AHRI, No. 11 at pp. 6-7; Lennox, No. 13 at p. 6; Rheem, No. 18 at p. 2) However, the commenters were unable to offer any clarity in applying the phrase "maintaining box temperature" – a central concern raised in DOE's request for comments. DOE's proposed definition attempted to provide a measurable criterion to clarify what maintaining box conditions entails. Specifically, DOE recognized that during a WICF refrigeration system test, the test room conditioning system would maintain the box conditions if the unit under test did not. 81 FR at 54931. DOE considered what it would mean for a refrigeration system to be maintaining box conditions if it is refrigerating a walk-in under the specified ambient temperature (35 °F), and concluded that the ability to maintain box conditions would depend on the load on the refrigeration system. If the thermal load exceeds the capacity of the unit, the unit will not maintain box conditions. DOE considered that the test procedure temperatures and specified loads in AHRI 1250-2009 might be a reasonable reference regarding the typical box thermal load. DOE notes that AHRI developed the industry test procedure, AHRI

1250, in 2009, with input from a working group consisting of industry and other stakeholders. Among other elements of the test procedure, the box load equations were developed through working group consensus and based on a comprehensive load analysis incorporating all key elements of the expected heat load. In developing the equations, that working group assumed a load of 70% of the capacity at 95 °F for coolers, and 80% of the capacity at 95 °F for freezers based on industry input. DOE used the box load equations in AHRI 1250-2009 (Equation 3 for medium-temperature and Equation 7 for low-temperature) in developing the proposed outdoor unit definition. DOE notes that commenters asserted that DOE provided no data, but the commenters did not dispute the suggestion that AHRI 1250-2009 might provide a reasonable indication of box loads, nor did they provide any alternative suggestion regarding what the box load might be at 35 °F. Hence, DOE believes that its proposed approach is appropriate to clarify the meaning of maintaining the box temperature and does not require additional data to substantiate it.

In response to Rheem's observation that the box load and the condensing unit capacities are not the same, DOE agrees. DOE considered that the box load equations specified in the industry standard AHRI 1250-2009 test procedure, which are the basis of the AWEF efficiency metric, would be a good representation of the relationship between the box load and the net capacity (in 95 °F test conditions) of a properly-sized condensing unit. DOE calculated the box load for a walk-in located in 35 °F ambient outdoor temperature conditions by using these equations specified in AHRI 1250-2009. For both medium-temperature and low-temperature units, the calculated box load is approximately 65% of the net capacity measured in 95 °F conditions. As mentioned above, in order to "maintain box conditions", the capacity must be equal to the box load—hence, DOE

proposed that maintaining the box load in 35 °F ambient conditions is equivalent to having a capacity in this ambient temperature that is 65% of the capacity in 95 °F conditions. Hence, DOE believes that the proposed definition is equivalent to both the Term Sheet recommendation and addressed comments that the definition for indoor/outdoor dedicated condensing unit should include language to "maintain box conditions."

However, given the comments provided on the proposed definition, DOE is concerned that the definition (as proposed) would not be sufficient to clearly distinguish outdoor units from indoor units. DOE agrees that unit capacity at 35 °F may exceed the capacity at 95 °F. However, if this is true for an indoor unit, the indoor unit would be able to maintain box conditions in a 35 °F ambient temperature, and in this case, the ability to "maintain box conditions" would not distinguish outdoor units from indoor units – which would undercut its value as a means of distinguishing outdoor condensing unit from an indoor unit. Regarding Hussmann's comment regarding enclosures, DOE is not certain whether it meant that true outdoor units are sometimes sold without enclosures. DOE's research has not identified any condensing units marketed for outdoor use that do not have enclosures, but agrees that it is possible for a system without an enclosure to be marketed for outdoor use. In recognition of this possibility, DOE's finalized definition does not include this requirement.

Given all of these considerations, DOE is unconvinced that the proposed definition, or the alternatives recommended by commenters, would be sufficient to clearly distinguish outdoor units from indoor units. Thus, DOE is taking a third approach

in this final rule, allowing the designation of indoor or outdoor to be provided by the manufacturer. However, in order to help ensure that dedicated condensing systems are installed and used appropriately, DOE is adopting the CA IOUs recommendation and will require that dedicated condensing units not designated for outdoor use will be labeled "indoor use only". While DOE does not believe, as suggested by the CA IOUs, that the indoor system standard is less stringent than the outdoor system standard (see further discussion regarding this issue below), DOE does have concerns that refrigeration systems that are not designed for outdoor use may not operate properly when installed outdoors, and thus use more energy.

The "indoor use only" label will help prevent the use of indoor units in outdoor applications, for which they are not suited. Further, DOE will allow a manufacturer to designate a unit for both outdoor and indoor use, thus acknowledging that condensing units suitable for outdoor units may be acceptable for use in indoor applications, as indicated by Rheem. (Rheem, Public Meeting Transcript, No. 23 at p. 27)

Accordingly, DOE is finalizing these definitions as follows:

Outdoor dedicated condensing refrigeration system means a dedicated condensing refrigeration system designated by the manufacturer for outdoor use.

Indoor dedicated condensing refrigeration system means a dedicated condensing refrigeration system designated by the manufacturer for indoor use or for which there is no designation regarding the use location.

DOE notes that "designated" in these definitions means any form of representation that the system may be used in the given location—this includes representations made in brochures, online product information, technical bulletins, installation instructions, labels, and other related materials. DOE notes that a dedicated condensing refrigeration system may be both an outdoor system and an indoor system according to the DOE definitions – but system cannot avoid classification by having no designation.

Regarding Rheem's comment that any outdoor dedicated condensing unit should also be allowed to be certified as an indoor dedicated condensing unit without additional testing, DOE believes that outdoor systems should be allowed to be sold as indoor systems if they comply with both the indoor and outdoor standards. A manufacturer choosing this approach would need to certify the system both as an indoor and as an outdoor system. It would also need to test that system at different requisite conditions related to outdoor and indoor use in accordance with the applicable test procedure provisions—specifically, tests for an outdoor unit are conducted at 95 °F, 59 °F, and 35 °F outdoor temperatures, while the active mode (i.e., while the compressor is operating) test for an indoor unit is conducted in a 90 °F environment. (See, e.g., Table 3 of AHRI-1250-2009 for test conditions for indoor matched-pair dedicated condensing medium-temperature units and Table 4 for outdoor indoor matched-pair dedicated condensing medium-temperature units.) DOE notes that the higher AWEF level and the typically more complicated design of outdoor units (i.e., they are designed with provisions to maintain elevated condensing temperature for operating in cooler outdoor temperatures) do not necessarily mean that the outdoor standard is more stringent. The outdoor AWEF

is higher in part because it is calculated on the basis of many hours of operation in cool outdoor ambient temperatures. Consequently, this fact indicates that a given basic model's compliance with an outdoor dedicated condensing system standard level does not imply compliance with the corresponding indoor standard – thereby undercutting Rheem's implied contention that a compliant outdoor system would always comply with the applicable indoor standard when tested using the indoor test. Generally, equipment meeting the definition of multiple equipment classes when operated would have to be tested and certified as each of these equipment classes to demonstrate compliance with DOE's energy conservation standards. Hence, in the case of outdoor dedicated condensing units that also meet the indoor definition (because they are also designated for indoor use), to ensure that no potential loopholes exist with outdoor units, compliance with both the outdoor and indoor standard must be adequately demonstrated by testing in accordance with the applicable test procedure (and sampling plan) or by applying an AEDM that meets DOE's regulatory requirements.

e. Unit Cooler

In addition to dedicated condensing systems, the definition of "refrigeration system" in 10 CFR 431.302 also includes unit coolers connected to a multiplex condensing system. DOE previously referred to this class of equipment as "multiplex condensing," abbreviated as "MC." DOE proposed to drop the term "multiplex condensing" and rename this class of equipment as "unit coolers" (i.e., "UC"), in order to align the term with this equipment's actual use. DOE also proposed to define unit coolers as "an assembly, including the means for forced air circulation and elements by which heat is transferred from air to refrigerant without any element external to the cooler

imposing air resistance." 81 FR at 54954. This definition intentionally omits the term "factory-made" to avoid suggesting that an assembly that is assembled from its subcomponents after shipment from the factory is not a unit cooler (and thus not covered by DOE's regulations).

Lennox, KeepRite, Rheem, ASAP and NEEA supported the proposed definition. (Lennox, No. 13 at p. 7; KeepRite, No. 17 at p. 1; Rheem, Public Meeting Transcript, No. 23 at p. 33; Rheem, No. 18 at p. 2; ASAP and NEEA, No. 19 at p. 1) Hussmann commented that the proposed definition could be applied to a condenser, if, "transferred from air to refrigerant" is interpreted as potentially referring to either heating or cooling the air. (Hussmann, Public Meeting Transcript, No. 23 at pp. 32-33)

In response to Hussmann's concern, DOE is modifying its proposal by adding "thus cooling the air" to the definition of unit cooler to clarify the direction of heat transfer. DOE believes this clarification will exclude condenser applications from the definition, since they heat rather than cool the air that passes through them. Accordingly, the definition for unit cooler refers to "an assembly, including means for forced air circulation and elements by which heat is transferred from air to refrigerant, thus cooling the air, without any element external to the cooler imposing air resistance."

f. Refrigeration System

DOE proposed defining a "refrigeration system" as "the mechanism (including all controls and other components integral to the system's operation) used to create the refrigerated environment in the interior of a walk-in cooler or freezer, consisting of: (1) A

dedicated condensing refrigeration system (as defined in 10 CFR 431.302); or (2) A unit cooler." 81 FR at 54932.

Rheem, Manitowoc, and KeepRite commented that the use of "or" between proposed clauses (1) and (2) in the definition would imply that a unit cooler would be considered a full refrigeration system, while, in reality, a unit cooler must be matched with a condensing unit to function as a full refrigeration system. Manitowoc and KeepRite recommended replacing "or" with "and" in the proposed definition. (Rheem, Public Meeting Transcript, No. 23 at pp. 34-35; Manitowoc, No. 10 at p. 4; KeepRite, No. 17 at p. 2)

DOE initially defined "refrigeration system" to set out the scope of coverage of this equipment in the April 2011 test procedure final rule for walk-ins. 73 FR at 21596-21597. However, DOE's test procedure for walk-in refrigeration systems has since been adjusted to permit manufacturers to certify compliance on a component basis, i.e., manufacturers may separately certify their condensing units and unit coolers, if their equipment is distributed in commerce on this basis. The "refrigeration system" definition was never intended to be a technical term that implied that the defined item included a complete refrigeration circuit, including the compressor, condenser, expansion device, and evaporator.

DOE notes that if the "or" is replaced by "and" as suggested in the written comments, the scope of coverage would be reduced to only pairs including a dedicated condensing system combined with a unit cooler. However, as mentioned earlier in this

discussion, by defining this term, DOE seeks to clearly set out the scope of regulatory coverage for this equipment, which could extend to an individual unit cooler or an individual condensing unit. Therefore, consistent with this approach, DOE is adopting the proposed definition in this rule.

g. Adaptive Defrost

Consistent with the Term Sheet, DOE proposed to define "adaptive defrost" as a defrost control system that reduces defrost frequency by initiating defrosts or adjusting the number of defrosts per day in response to operating conditions (e.g., moisture levels in the refrigerated space, measurements that represent coil frost load) rather than initiating defrost strictly based on compressor run time or clock time. See 81 FR at 54932-54934.

KeepRite and Rheem supported the proposed definition. (KeepRite, No. 17 at p. 7; Rheem, No. 18 at p. 3) Lennox agreed with DOE's proposed definition but noted that the proposed definition does not specifically indicate the unit construction (e.g., presence of a defrost control) that must be in place to receive the credit. As a result, Lennox expressed concern that the credit may be applied to units that are not able to achieve the represented efficiency level and whose unit rating cannot be verified because adaptive defrost construction is not physically installed on the unit. Therefore, Lennox recommended revising the language of the adaptive defrost definition to indicate that representation of energy use improvements associated with adaptive defrost can only be applied to equipment that has adaptive defrost already included with the unit from the factory. (Lennox, No. 13 at p. 7)

As DOE noted in the August 2016 NOPR, this proposed definition is consistent with the Working Group's agreement that manufacturers should rate their systems for compliance purposes without the adaptive defrost credit, but that the test procedure would continue to retain its current method for calculating the benefit of adaptive defrost to permit manufacturers to make representations of system efficiency with this feature included. As indicated in the NOPR, the Working Group discussed this topic extensively. (See, e.g., manufacturer discussion expressing concerns that DOE had not adequately defined adaptive defrost and that the test procedure could permit a manufacturer to claim the energy efficiency credit for systems with this feature even if those systems may not necessarily yield the efficiency performance improvement consistent with the credit provided by the test procedure—Docket No. EERE–2015–BT–STD–0016; Lennox, Public Meeting Transcript (September 11, 2015), No. 61 at p. 87; Lennox and Rheem, Public Meeting Transcript (September 30, 2015), No. 67 at pp. 138–144.) After settling on the certification approach for adaptive defrost, the Working Group agreed on a definition of adaptive defrost without resolving the question of how DOE would verify that a unit cooler or condensing unit has adaptive defrost capability. 81 FR at 54933. DOE agrees with Lennox's assertion that representation of energy use improvement associated with adaptive defrost should be allowed only for units that actually have the technology installed on the unit. The requirement that the manufacturer certify to DOE the improved AWEF of such an adaptive defrost model suggests that these models are manufactured with adaptive defrost controls and are shipped from the factory with such controls already installed, rather than being an option installed after shipping. For this reason, DOE is including the phrase "factory-installed" in the definition to help ensure

that those models with improved AWEF representations all have adaptive defrost technology installed. Thus, DOE is modifying the definition consistent with this approach by defining adaptive defrost as referring to a factory-installed defrost control system that reduces defrost frequency by initiating defrosts or adjusting the number of defrosts per day in response to operating conditions rather than initiating defrost strictly based on compressor run time or clock time.

h. Process Cooling

Background

EPCA defines a walk-in as "an enclosed storage space," that can be walked into, which has a total area of less than 3,000 square feet, but does not include products designed and marketed exclusively for medical, scientific, or research purposes. (42 U.S.C. 6311(20)) The use of the term "storage space" in the definition raises questions about which refrigerated spaces would qualify as a "storage space" and thereby comprise equipment subject to the walk-in standards. DOE has discussed the scope of this definition throughout its rulemakings to develop test procedures and energy conservation standards for walk-ins—most recently, the August 2016 NOPR addressed whether the scope extends to process cooling equipment such as blast chillers and blast freezers that can be walked into. 81 FR at 54934-54936.

In the August 2016 NOPR, DOE described the background leading to the proposal of a definition for walk-in process cooling refrigeration equipment. 81 FR at 54934. As described in that document, interested parties requested that DOE clarify the

applicability of standards to this equipment as part of the initial standards rulemaking that DOE conducted for developing walk-in performance-based standards. The discussions in that prior rulemaking led DOE to conclude in the June 2014 final rule that equipment used solely for process cooling would not be required to meet the walk-in standards, but that products used for "both process and storage" applications could not categorically be excluded from coverage. 79 FR at 32068. The August 2016 NOPR noted also the October 2014 meeting to clarify aspects of the test procedure, during which DOE again stated that blast chillers and blast freezers did not fall within the scope of the energy conservation standards established for walk-ins in the June 2014 final rule. However, DOE acknowledged at the time that it did not have a definition for "process" cooling in the context of walk-ins. (Docket No. EERE–2011–BT–TP–0024, Heatcraft and DOE, Public Meeting Transcript (October 22, 2014), No. 0117 at pp. 23, 61– 63) The question of process cooling arose again during the Walk-in Working Group meetings, during which meeting participants asked DOE to add definitions to clarify the meaning of process cooling (See Docket No. EERE–2015–BT–STD–0016: manufacturer-submitted material, No. 6 at p. 2; Lennox, Public Meeting Transcript (August 27, 2015), No. 15 at pp. 96–97; AHRI, Public Meeting Transcript (December 15, 2015), No. 60 at pp. 141–142; and Term Sheet, No. 56, Recommendation #7)

The August 2016 NOPR explained that DOE considered process cooling more carefully in light of the Working Group's request to develop clarifying definitions and concluded that its initial statements in the 2014 final rule that blast chillers and blast freezers are not walk-ins were in error. DOE observed that, although the EPCA definition refers to a walk-in as an "enclosed storage space", there is no clarity regarding the

meaning of “storage” or the minimum duration for an item to remain in an enclosure to be considered in “storage”. Hence, DOE now believes that these categories of equipment, referred to as “process cooling equipment” do fall under the EPCA definition for walk-ins and are, subject to standards. 81 FR at 54934.

The August 2016 NOPR went on to discuss DOE’s proposal for defining a walk-in process cooling refrigeration system. DOE specifically developed this proposal, acknowledging the different energy use characteristics of process cooling refrigeration systems as well as their different equipment attributes (as compared to other walk-in refrigeration systems), to exclude such equipment from being subject to walk-in refrigeration system performance standards. (Because DOE now regards process cooling systems as “walk-in coolers or freezers,” they will be subject to the statutory design requirements.) DOE proposed defining a “walk-in process cooling refrigeration system” as “a refrigeration system that is used exclusively for cooling food or other substances from one temperature to another.” 81 FR at 54936. The proposed definition specified that a process cooling refrigeration system must either be (1) distributed in commerce with an enclosure consisting of panels and door(s) such that the assembled product has a refrigerating capacity of at least 100 Btu/h per cubic foot of enclosed internal volume or (2) a unit cooler having an evaporator coil that is at least four-and-one-half (4.5) feet in height and whose height is at least one-and-one-half (1.5) times the width. This proposed definition would cover process cooling systems that are distributed in commerce as part of a complete assembly, process cooling unit coolers that are distributed separately from the enclosure, and refrigeration systems -- including unit coolers meeting the process cooling definition. 81 FR at 54954.

DOE noted in the NOPR that it proposed to consider process cooling refrigerated insulated enclosures to be walk-ins that are subject to the prescriptive statutory requirements for walk-ins. DOE also notes that its discussion and proposals focused on process cooling refrigeration systems rather than the panels and doors that make up the insulated enclosure. Hence, DOE intended the exclusions associated with the proposals to apply only to refrigeration systems that meet the process cooling definition, and that the exclusions would be associated with walk-in refrigeration system performance standards. Id. at 54934-54936. DOE also provided a table in the public meeting presentation to clarify its interpretation of the applicability of walk-in standards to different components of process cooling equipment. (Public Meeting Presentation, No. 3 at p. 30) This table indicated that the proposed exclusion for process cooling refrigeration systems would apply to, among other things, dedicated condensing units that are exclusively distributed in commerce with unit coolers meeting the unit cooler portion of the process cooling definition. DOE notes that this exclusion was not explicit in the proposed definition and is clarifying it to explicitly include such dedicated condensing units in the definition.

Importance of Coverage for Process Cooling Equipment

DOE explained in the August 2016 NOPR the reasons it believed that walk-in process cooling equipment should be considered to be covered under the walk-in definition. See 81 FR 54934-54936. DOE discusses comments responding to this position, and DOE's responses to them. DOE ultimately concludes that this equipment should be covered as walk-in equipment. In DOE's view, covering this equipment as a

class of walk-in is important in furthering DOE's goals for reducing and limiting energy use because this equipment represents a growing sector of the refrigeration industry. Process cooling equipment emerged on the market relatively recently in 1990 to serve a range of food sales and service applications. (Master-Bilt Blast Chillers, No. 25 at pp. 2, 3, 10) The global blast chiller market is expected to grow by an estimated 4.62% per year from 2016-2020 and North America is expected to remain a dominant portion of this market.[5] This growth is the expected result of increased demand in the food service industry (e.g., restaurants, bakeries, catering) and meat processing industry and growth in the frozen food market.[6] Hence, DOE believes that there will be a robust market for process cooling equipment to serve this growing market need, and that there is a large potential growth in energy use associated with this market.

Process Cooling Equipment Status as Walk-in Equipment

Many commenters argued that process cooling equipment does not fall under the walk-in definition. Several of these comments argued that food is not "stored" in this equipment and/or the temperature within it is not "held" at a given temperature for storage purposes. AHRI, Manitowoc, KeepRite, Rheem, and Hussmann stated that process refrigeration systems are not used for storage and therefore do not satisfy the statutory definition for a walk-in as an "enclosed storage space." (AHRI, No. 11 at p. 5;

[5] Infinity Research Limited (Technavio), Global Commercial Blast Chillers Market 2016-2020; Published November 2016; Accessed November 2016 at www.technavio.com/report/global-miscellaneous-global-commercial-blast-chillers-market-2016-2020.

[6] Hexa Research, Frozen Food Market Analysis By Product (Ready Meals, Meat, Seafood, Fruits & Vegetables, Potatoes, Soup) And Segment Forecasts To 2020; Published November 2014; Accessed November 2016 at www.hexaresearch.com/research-report/frozen-food-industry/.

Manitowoc, No. 10 at p. 3; KeepRite, No. 17 at p. 2; Rheem, No. 18 at p. 3; Hussmann, No. 20 at p. 4) Similarly, Zero Zone argued that the purpose of process refrigeration systems conflicts with the dictionary definition of "storage." (Zero Zone, No. 15 at p. 1) American Panel also explained that product could be dehydrated and damaged if left in the process cooling equipment for an extended period of time. In its view, this fact should disqualify process cooling equipment from being considered as storage space – one of the key elements of the walk-in definition. (American Panel, No. 7 at p. 1) AHRI added that the Term Sheet included the recommendation that DOE define process cooling for the purpose of clarifying that process cooling equipment are not included in the scope of WICFs. (AHRI, No. 11 at p. 5)

EPCA defines "walk-in cooler" and "walk-in freezer" as an enclosed storage space refrigerated to temperatures, respectively, above, and at or below 32 degrees Fahrenheit that can be walked into, and has a total chilled storage area of less than 3,000 square feet. (42 U.S.C. 6311(20)(A)) While EPCA does not define the component terms "storage" or "can be walked into" used in the walk-in definition, it does expressly exclude certain equipment from the definition (i.e. equipment designed and marketed exclusively for medical, scientific, or research purposes). (42 U.S.C. 6311(20)(B))

Commenters appear to be arguing that a unit must hold contents for some minimum time-period to meet the "storage" element of the definition but offered no suggested time period for DOE to consider in applying this definition. The statutory definition of "walk-in cooler and walk-in freezer" does not indicate a specific timing requirement or provide further information about when the use of a space constitutes

storage. Further, although dictionary definitions of "storage" indicate that the contents be kept for some period of time, no specific period is provided.[7] As noted in the NOPR, the Working Group recommended that DOE define "storage space" -- which suggests that the term is ambiguous. 81 FR at 54934. DOE acknowledges that the role of a process cooler or freezer is to chill food rapidly (to approach the temperature of the cooler or freezer, respectively), and one could interpret "storage space" to mean a space the primary purpose of which is storage. However, that understanding of "storage space" would be incongruous in the context of walk-in coolers and freezers. The purpose of such equipment is not simply storage *per se*, like a warehouse; it is storage at cold temperatures. Storage at cold temperatures necessarily encompasses chilling the items to be stored until they reach the temperature of the storage space, because items are rarely at exactly the storage temperature when they arrive to a walk-in cooler or freezer. A process cooler or freezer chills items more quickly than many walk-ins, but DOE regards that difference as being a difference in degree, not a fundamental difference in kind that makes a process cooler "chilling" equipment and not "storage" equipment.

DOE notes that Recommendation #7 from WICF Term Sheet (which contains the only mention of process cooling in the Term Sheet) recommended that DOE add "WICF specific definitions for process cooling, preparation room refrigeration, and storage space." (Docket EERE-2015-BT-STD-0016, Term Sheet, No. 56 at p. 3) This

[7] "Storage: 1. the act of storing; state or fact of being stored. 2. capacity or space for storing. 3. a place, as a room or building, for storing. 4. Computers. memory (def 11). 5. the price charged for storing goods." en.oxforddictionaries.com/definition/storage. "Storage: 1a : space or a place for storing b : an amount stored c : memory; 2a : the act of storing : the state of being stored; especially : the safekeeping of goods in a depository (as a warehouse)b : the price charged for keeping goods in a storehouse." www.merriam-webster.com/dictionary/storage

recommendation does not state that these categories of equipment are excluded from the scope of WICFs. In fact, a comment received in response to the initial 2013 notice of proposed rulemaking for energy conservation standards stated that process cooling equipment would appear to fall within the walk-in definition. (Docket No. EERE-2008-BT-STD-0015, Hussmann, No. 93 at pp. 2, 8-9) In re-examining that comment, along with other information and materials since the publication of the June 2014 rule, DOE has reconsidered its prior views on process cooling equipment.

As noted in the NOPR, contents are placed in process cooling equipment for at least a brief period of time to reduce their temperature. 81 FR at 54934. When asked during the public meeting how long the products remain in a process cooling system when they are being cooled, American Panel noted that, although the Food and Drug Administration and NSF International issue recommended maximum processing times, there is no industry-specified minimum or maximum processing duration for blast chillers or blast freezers. (American Panel, Public Meeting Transcript, No. 23 at p. 48) DOE notes that the 2013 FDA Food Code requires that food starting at 135 °F be cooled to 70 °F within 2 hours and to 41 °F within 6 hours (FDA 2013 Food Code, Chapter 3, Section 501.14(A)), while NSF requires that rapid pulldown refrigerators and freezers be able to reduce food temperature from 135 °F to 40 °F in 4-hours. (NSF/ANSI 7-2009, section 10.5.1) These time periods differ significantly and are substantially longer than the 90-minute pulldown times discussed in the June 2014 final rule. (79 FR at 32068). This observation underscores American Panel's statement that there is no standard maximum processing time. Also, while DOE recognizes that product may remain in process cooling equipment for a short period of time, this fact alone does not necessarily

clarify that the equipment cannot be considered to have a storage function. The period of time a product can be held in a cooler or freezer without sustaining some damage can be expected to vary product by product, depending on a variety of factors including, whether the product is chilled or frozen, its packaging when inserted into the equipment (e.g., what type and size container it is in, whether or not it is covered, etc.), moisture content, size of the individual food pieces, and other factors. Commenters did not provide any indication of how long food products can remain in process cooling equipment after completion of cooldown before they must be removed to avoid damage—hence, making it difficult to draw clear distinctions between residence time in this equipment and lengths of time that would be associated with "storage."

Absent a definitive time-period to delineate the use of space as storage space, DOE considered the design and operation of process cooling equipment with other equipment falling within the WICF definition. DOE considers that design and operation are reflective of the function of equipment (i.e. whether it constitutes storage space) because these two elements are necessary components in determining the function or purpose of a given type of equipment.

Manitowoc and AHRI argued that the panels and doors used by process cooling systems are not the same as those used in other WICF systems and therefore the WICF prescriptive requirements should not apply. (Manitowoc, No. 10 at p. 3; AHRI, No. 11 at p. 5) Manitowoc and AHRI did not clarify how the panels and doors are different, and provided no indication that process coolers needed specific utility features that would justify the use of different efficiency levels or be the basis for relief from the performance

requirements that are already in place. DOE notes that this discussion of panels and doors did not provide any clarity as to whether process cooling equipment provides any storage function.

In the context of blast chillers, American Panel noted that while the panels and doors for this equipment were similar to those used in other walk-ins, the refrigeration systems used in blast chillers are designed and used very differently from walk-ins – a fact that, in its view, necessitated that these (and similar process cooling equipment) be treated separately from walk-ins. (American Panel, No. 7 at p. 1) American Panel did not clarify how the refrigeration systems are designed differently, in spite of DOE's request for data or information on the qualities, characteristics, or features specific to the refrigeration system that would cause a process refrigeration system to be unable to meet a walk-in refrigeration system standard. See 81 FR at 54950.

American Panel, however, asserted that blast chillers and shock freezers differ from walk-ins in that they have an on/off switch, they do not reach a stable condition until the pulldown cycle ends, either automatically or manually, and they rely on the user to stop and restart the cycle. (American Panel, No. 7 at p. 1) In its view, all of these features differed from the operation of walk-ins, which typically operate continuously and independent of user action, being connected to power at all times. DOE notes that this description of refrigeration equipment operation also applies to other walk-in systems. The walk-in refrigeration system is sized so that its capacity is greater than the walk-in box load. Equation 1, for example, in AHRI 1250-2009, indicates that the box load for a walk-in is 70 percent of the net refrigeration system capacity at the design

temperature for conditions outside the box. Hence, a walk-in refrigeration system does not achieve steady state operation—it relies on a thermostat to shut the system off at the desired internal temperature (e.g., 35 °F for a walk-in cooler) as the refrigeration system is pulling down temperature to what would be a lower steady-state temperature. As American Panel indicated, a process cooling system does not reach stable operation until the pulldown cycle has ended and an automatic control may end the cycle to transition the system from the pulldown cycle into stable operation. This ending of the pulldown with an automatic control is the same as a walk-in system's pulldown cycle ending by a thermostat. Hence, in DOE's view, American Panel's observations do not provide a clear distinction between process cooling and other walk-in equipment since the fundamental operational characteristics remain the same.

American Panel also contended that, because a blast chiller's operation changes continuously and the equipment exhibits no stable operating condition, it cannot be tested to a rated AWEF and a test procedure cannot be applied. (American Panel, Public Meeting Transcript, No. 23 at pp. 46-47, 56, 78) American Panel added that, if the test procedure were to be updated to include blast chiller performance testing, the food industry would support using NSF's testing methods for rapid pulldown refrigeration as a starting point. (American Panel, No. 07 at p. 2) DOE notes first that a performance-based test procedure requiring steady state operation is not necessary for process cooling refrigeration systems, because equipment meeting the definition is excluded from the

walk-in refrigeration system performance standards,[8] and, hence, a method for measuring AWEF for such equipment is not needed. However, DOE notes also that a blast chiller refrigeration system appears to have no steady operating condition because its capacity is so much larger per insulated box internal volume than for other walk-ins. Once the products have been pulled down to the specified temperature, the walls of the box do not transmit sufficient load to prevent the internal box temperature from dropping further – i.e. the box does not absorb enough heat to prevent its interior from becoming colder. If the same refrigeration system were serving a much larger box, the internal temperature may very well stabilize to a steady-state operating temperature. Conducting a test to determine the system's AWEF would require testing the equipment with a test chamber whose indoor-room conditioning system has enough heating capacity to balance the refrigeration system's cooling capacity. Hence, the difference between a process cooling refrigeration system and other walk-in refrigeration systems is a function of the magnitude of capacity, rather than any fundamental difference in the operation of the equipment. While the magnitude of capacity is relevant to how quickly a unit lowers the temperature of its contents, and may be instructive as to the duration of storage, it does not inform the fundamental consideration of whether a unit provides any storage.

Process cooling equipment such as blast chillers and blast freezers, despite any asserted differences, have several characteristics in common with more conventional walk-ins that make them capable of serving the function of refrigerated product storage.

[8] DOE notes that this exclusion does not apply to condensing units distributed in commerce individually, because, as discussed elsewhere in this section, they are indistinguishable from other walk-in refrigeration systems.

These characteristics include having an insulated enclosure made of insulated panels and a door (or doors) sufficiently large that the enclosure can be walked into, and being cooled with a refrigeration system consisting of a dedicated condensing unit and a refrigerant evaporator that operates using forced convection heat transfer (i.e., enhanced by air movement created by a fan). The panels and doors are fabricated with a sheet metal exterior shell around insulation that serves as a thermal barrier. The panels and/or door also may also have a multi-pane window to allow viewing of the interior of the enclosure from the outside. The doors have hinges or another mechanism to allow opening for access to the enclosure interior, with a latching mechanism to ensure positive closure when shut. The refrigeration system can operate to cool the enclosure to refrigerated temperatures. Product can be placed in the refrigerated enclosure. If the product is not already at the temperature of the internal refrigerated space, the product's temperature will drop, approaching the temperature of the interior, due to transfer of heat to the air within the enclosure; otherwise the product temperature remains at the average internal temperature until removed from the enclosure. As discussed above, while some of the details of the design of such systems differ from other walk-ins, these equipment generally resemble all walk-ins and are capable of serving the function of refrigerated product storage.

AHRI, Manitowoc, and Rheem also asserted that process cooling equipment is inconsistent with the term "walk-in" because a person cannot walk into a process cooling enclosure during operation. (AHRI, No. 11 at p. 5; Manitowoc, No. 10 at p. 3; Rheem, No. 18 at p. 3) However, DOE notes that the walk-in definition does not specify when

the equipment can be walked into – it simply states that the equipment must be one "that can be walked into." (42 U.S.C. 6311(20)(A))

In interpreting the "walk-in cooler and freezer" definition, DOE also considered the terms in the context of EPCA's WICF provisions as a whole. EPCA establishes a number of prescriptive requirements for WICFs. (42 U.S.C. 6313(f)(1)) While not dispositive, none of the prescriptive requirements conflicts with including process cooling equipment as a class of walk-in. Additionally, Congress has already spoken to the groups of equipment that are excluded from the walk-in definition by listing specific equipment (i.e. ones designed and marketed exclusively for medical, scientific, or research purposes) that would be walk-ins. (42 U.S.C. 6311(20)(B)) Process cooling equipment is not part of this listing, which suggests that Congress did not contemplate that this equipment would be excluded from being treated as a class of walk-in equipment.

In consideration of these factors, DOE has determined that process cooling equipment falls within the EPCA definition of "walk-in cooler" and "walk-in freezer." While products may not be able to be stored in process cooling equipment on a long-term basis, products are still stored in process cooling equipment at least for the duration they are cooled. If Congress had intended to limit the application of the walk-in definition to include only long-term storage, it could have done so when crafting the final language of the statute. Congress, in fact, did not limit what comprises storage space. Moreover, when comparing the design and function of process cooling equipment with other WICFs, DOE was unable to determine a distinction with regard to storage.

AHRI, Manitowoc, KeepRite, Rheem, and Hussmann argued that including process cooling equipment in the definitions of walk-in cooler and walk-in freezer would be inconsistent with DOE's proposed definition for refrigerated storage space, "as space held at refrigerated temperatures" since process cooling equipment does not hold a specific temperature but changes the temperature of the contents. (AHRI, No. 11 at p. 5; Manitowoc, No. 10 at p. 3; KeepRite, No. 17 at p. 2; Rheem, No. 18 at p. 3; Hussmann, No. 20 at p. 4) DOE notes that comments submitted by Bally describe process cooling equipment as operating at "cold temperatures (min. of 5 °F)" and having "doors [that] must stay condensate free while the air temperature is at 5 °F." (Bally, No. 22 at p. 1) These descriptions suggest control of temperature within the blast chiller is held at the minimum 5 °F—in other words, the interior is held at a temperature near 5 °F. This fact suggests that process cooling equipment can (and do) hold temperatures, contrary to the comments. Nevertheless, DOE notes that the proposed definition for refrigerated storage space as "space held at refrigerated temperatures" does not require that the temperature be held at a discrete constant value – instead, it only requires that the space is held at a temperature consistent with "refrigerated," i.e., "held at a temperature at or below 55 °F". The spaces within blast chillers and freezers are held below 55 °F and, thus are consistent with the definition of "refrigerated storage space."

NAFEM also weighed in on this issue generally, arguing that blast chillers should not be considered within the scope of the walk-in definition because there is no appropriate test procedure for blast chillers. (NAFEM, No. 14 at p. 1) However, EPCA's walk-in definition does not stipulate that its scope extends only to equipment for which there is a test procedure. In fact, EPCA mandated prescriptive standards for walk-ins that

took effect (on January 1, 2009, see 42 U.S.C. 6313(f)(1)) before DOE finalized a test procedure on April 15, 2011 for measuring a given unit's energy efficiency. 76 FR 21580. Similarly, in response to American Panel's comment that a process cooling refrigeration system is not a walk-in because it cannot be rated with an AWEF, satisfaction of the separate statutory prescriptive requirements specified in the statute (e.g. use of certain componentry, satisfaction of certain thermal insulation thresholds for doors and panels, and installation of devices to minimize infiltration) have no direct bearing on the AWEF value of a given refrigeration system. Hence, the question of whether a given walk-in refrigeration system can be rated with this metric has no bearing on whether the equipment is a walk-in.

Manitowoc, Rheem, and AHRI also noted that an ASHRAE Special Project Committee ("SPC") has been formed to draft a relevant testing standard titled, "Method of Testing for (Rating) Small Commercial Blast Chillers, Chiller/Freezers, and Freezers." They argued that in light of this work, it is premature to define process cooling systems while this new industry standard is still under development. (Manitowoc, No. 10 at p. 3; Rheem, No. 18 at p. 3; AHRI, No. 11 at p. 5) DOE notes that the WICF Working Group, which included Manitowoc and Rheem, requested that DOE develop a definition for process cooling. Before the finalization of the WICF Term Sheet on December 15, 2015, DOE was not aware of any announcement from ASHRAE SPC regarding the start of its work. Nevertheless, the SPC has not finished its work, and the commenters did not provide any indication of what equipment definitions the SPC is considering. Accordingly, DOE has finalized its definition in the manner proposed, based on the industry input provided. DOE may consider revising its "process cooling" definition if

necessary once the ASHRAE rating method for blast chillers, chiller/freezers, and freezers is complete.

Finally, DOE notes that the CA IOUs supported treating process cooling as a subset category of WICF equipment. Further, they supported requiring process cooling panels, doors, and dedicated condensing units not sold as part of a "matched-pair with a unit cooler" to meet the 2014 final rule WICF standards and the proposed standards under consideration. (CA IOUs, No. 21 at p. 2)

As described in the NOPR, DOE concluded that while process cooling enclosures that resemble walk-ins are within the scope of walk-ins, it proposed to exclude some of the refrigeration systems of these process cooler walk-ins from the performance-based standards established and in development for WICF refrigeration systems. 81 FR at 54934-54937. For the reasons described earlier, DOE has not revised its proposed approach after review of the comments, and believes that its definition, as adopted in this rule, satisfies the recommendations of the Working Group Term Sheet.

Distinguishing Characteristics of Process Cooling Refrigeration Systems

DOE received few comments regarding the distinguishing characteristics proposed for process cooling refrigeration systems. In fact, only one of the commenters mentioned any characteristic of the refrigeration system condensing unit of a process

cooling system that might distinguish it from the equipment serving other walk-ins—Bally commented that the condensing units are not unique to blast chillers, except with respect to extra receiver capacity. (Bally, No. 22 at p. 1) However, DOE would not consider a larger receiver to be a sufficient difference to distinguish these condensing units since using a larger receiver would not affect steady state energy use as measured by the test procedure, since the receiver itself does not consume energy and does not contribute significantly to the heat transfer function of the condenser. Furthermore, there is a range of refrigerant receiver capacities used in walk-in refrigeration systems and it is not clear that there is an appropriate receiver capacity threshold that would indicate that a condensing unit is used for process cooling rather than for other walk-in functions—neither Bally nor other commenters suggested such a threshold value. Consequently, DOE would not consider a larger receiver to distinguish process cooling condensing units. Absent any other clear distinguishing feature, DOE must conclude that the condensing units used for process cooling are no different than those used for other walk-ins.

Lennox recommended that the evaporator coil height, width, and depth be defined on a diagram accompanying the proposed definition to prevent a misinterpretation of the dimensions. (Lennox, Public Meeting Transcript, No. 23 at p. 40) Lennox provided a diagram to illustrate this in its written comments (Lennox, No. 13 at p. 8) In reviewing this diagram, DOE agrees that the dimensions shown in the provided diagram are consistent with the proposed definition's intent and agrees that a diagram would be useful to clarify the applicable dimensions. Accordingly, the final rule incorporates a diagram based on the one submitted by Lennox to clarify the process cooling definition.

With respect to blast freezers, Bally noted that some of these equipment use horizontally-oriented evaporator units and some non-process cooling refrigeration systems chill their contents using a circular pattern. In its view, because of the absence of any standard orientation or chilling pattern for process cooling and non-process cooling refrigeration systems, these design characteristics are not useful for differentiating process refrigeration systems. (Bally, Public Meeting Transcript, No. 23 at pp. 41-42) DOE notes that a horizontally-oriented evaporator that is not part of a unit cooler as defined would not be subject to the unit cooler standards, nor would it, as a matched pair with a dedicated condensing unit, be subject to the dedicated condensing unit standards. In order to clarify the extension of this exclusion to matched pairs including such evaporators, DOE has modified the process cooling refrigeration system definition to explicitly list dedicated condensing units that are distributed in commerce exclusively with evaporators that are not unit coolers.

Alternatively, Bally suggested that airflow rate may be a good characteristic for differentiating process refrigeration systems from other walk-in refrigeration systems. (Bally, Public Meeting Transcript, No. 23 at p. 44) American Panel expressed concern with the use of a cooling capacity per enclosed volume rating to differentiate process cooling equipment because the equipment may be used to process different quantities or densities of product at different times – a condition which may prevent a given blast chiller from satisfying a definition based on cooling capacity per enclosed volume. (American Panel, Public Meeting Transcript, No. 23 at pp. 38-39) DOE had considered airflow rate or air velocity to distinguish process cooling evaporators, noting that evaporator fan power, velocity, or air flow of a unit cooler could be atypically high for a

number of reasons, including the use of inefficient fans or motors, long air ‘‘throw’’ distance, and other factors. (See 81 FR at 54936) For example, DOE’s investigation of evaporator fan horsepower showed that the horsepower for process cooling evaporator fans, although generally higher than for other walk-in evaporators, is not always higher than all such other walk-in evaporators – a potential overlapping fact that lessens the value of using horsepower as a clear distinguishing characteristic. Hence, DOE concluded that there would be too much overlap with other WICF unit coolers on the basis of these parameters. DOE notes that Bally’s submission did not provide sufficient information or data that would support the use of a specific air flow rate on which DOE could rely that would serve as the basis for distinguishing process coolers from other walk-in refrigeration systems. With respect to American Panel’s concerns, DOE notes that its comments provided no alternative value of cooling load per volume for DOE to consider that would enable one to readily distinguish process cooling refrigeration systems from non-process cooling refrigeration systems. While American Panel seems to suggest that the capacity of the refrigeration system would depend on the load inserted into a process cooler, DOE disagrees, because the capacity cited in the proposed definition is the refrigeration system’s net capacity when determined in a manner consistent with the prescribed walk-in test conditions—this capacity depends on the refrigeration system characteristics, not on how much product is being cooled. Specifically, when testing a condensing unit alone, the test calls for maintaining certain operating conditions (see, e.g., tables 11 through 14 of AHRI 1250-2009, which specify air and refrigerant entering conditions and refrigerant exiting subcooling condition, but nothing about the quantity of product being cooled). No commenters provided specific

suggestions regarding the appropriateness of the proposed 100 Btu/h per cubic foot, i.e., what lower value would be more appropriate. Additionally, commenters provided no other suggestions regarding more appropriate distinguishing characteristics to use for process cooling refrigeration systems, and none provided specific quantified values for recommended parameters to use in the definition. Hence, DOE is largely adopting the approach contained in its proposed definition.

However, to address the comments regarding the inconsistency of the "storage" aspect of walk-ins with the pulldown of product temperature in process cooling equipment, DOE will modify the definition to identify refrigeration systems that are "capable of rapidly cooling food or other substances" rather than systems that are "used exclusively" for this purpose. Also, in order to clarify that the enclosure that uses these refrigeration systems is insulated, DOE will insert "insulated" before the word "enclosure" in the definition.

KPS raised concern regarding the precision of the process cooling definition, indicating that "blast chillers" and "blast freezers" are used by customers and manufacturers to describe a range of product types. (KPS, No. 8 at p. 1) KPS did not, however, elaborate on what other types of equipment should be addressed (or excluded) by DOE's proposed definition. DOE is aware, for example, of blast chillers and freezers that are smaller than walk-ins and that might be considered "reach-in process cooling equipment," i.e., process cooling equipment which the user reaches into rather than walks into to insert or remove product. This terminology is consistent with the term "reach-in" used with commercial refrigeration equipment (see, e.g., Reach In Refrigerator, No. 26)

However, DOE is not concerned that such equipment would be confused with walk-in process cooling equipment, because such reach-in equipment cannot be walked into.

Other Comments from Manufacturers of Process Cooling Equipment

Bally noted that blast chillers are built in small quantities with uniquely designed electronically commutated motors ("ECMs") and expressed concern with how the proposed regulations would affect the ECM supply chain. (Bally, Public Meeting Transcript, No. 23 at pp. 42-43) Bally elaborated in written comments that ECM orders can have up to 15 weeks of lead-time and have to be ordered in small batches. (Bally, No. 22 at pp. 1-2) Accordingly, Bally suggested that the proposed 60-day enforcement delay be extended to allow for changes in the refrigeration equipment industry to meet the new regulations. (Bally, Public Meeting Transcript, No. 23 at p. 50) Given the 15-week lead-time indicated in the comment, DOE plans to issue a policy stating that DOE will exercise its enforcement discretion for 120 days after publication of the final rule, to allow manufacturers of walk-in refrigeration systems that are used exclusively in process cooling applications to comply and to certify compliance with the applicable statutory standard.

With respect to the proposed definition for process cooling refrigeration systems, Bally suggested that the definition specify that the doors used with this equipment be freezer doors. (Bally, Public Meeting Transcript, No. 23 at p. 53) Bally reiterated this comment in its written submission, indicating that the 5 °F temperature inside a blast chiller makes it challenging to prevent the formation of condensation. (Bally, No. 22 at

p. 1) In response, DOE notes that a walk-in with a 5 °F internal temperature is technically a freezer (see e.g., the definition for walk-in cooler and walk-in freezer, which states that freezers are refrigerated to temperatures below 32 °F, 42 U.S.C 6311(20)(A)), and hence, the door standards applicable to freezer doors would apply for such equipment.

Bally also requested that there be no requirement for floor insulation for process equipment. It noted that tray carts must roll in and out of the enclosure, which means that they cannot use ramps, and that building a pit to accommodate the necessary insulation would be expensive and could pose structural issues. (Bally, No. 22 at p. 1) Consistent with DOE's view, as discussed elsewhere in this discussion, that the process cooling enclosures discussed by Bally would be considered to be walk-in freezers, DOE notes that the statutory prescriptive requirements already require floor insulation of R-28. (42 U.S.C. 6311(f)(1)(D)) Given this requirement, DOE has no discretion regarding the applicability of the floor insulation requirement, which is imposed by statute.

i. Preparation Room Refrigeration

DOE proposed defining "preparation room refrigeration" as comprising applications that use "a unit cooler that is designed for use in a room occupied by personnel who are preparing food and that is characterized by low outlet air velocity, evaporator temperature between 30 and 55 degrees Fahrenheit, and electric or hot gas defrost." 81 FR at 54937. While DOE proposed to define this type of refrigeration system for the purpose of enhancing clarity, this equipment would not be exempt from the applicable standards that were already prescribed by Congress with respect to walk-ins. DOE requested comment on any other characteristics of preparation room

refrigeration that would (1) clearly distinguish it from other walk-in refrigeration systems and (2) otherwise make this equipment unable to meet a given walk-in refrigeration standard.

Preparation Room Equipment Status as Walk-in Equipment

Commenters addressed whether preparation room equipment falls under the scope of walk-ins. As mentioned in section III.A.1.h, AHRI noted that preparation room refrigeration was included in the WICF Term Sheet in order to exclude this equipment from the scope of walk-ins. (AHRI, No. 11 at p. 5) However, as noted in the discussion of that section, the Term Sheet did not provide any guidance regarding whether preparation room refrigeration falls within the scope of walk-ins. (Docket EERE-2015-BT-STD-0016, Term Sheet, No. 56 at p. 3)

AHRI, Lennox, Manitowoc, Hussmann, Rheem, and KeepRite asserted that preparation rooms fall outside the scope of walk-ins and urged DOE to exclude them. (AHRI, No. 11 at pp. 4-5; Lennox, No. 13 at pp. 8-9; Manitowoc, No. 10 at p. 3; Hussmann, No. 20 at p. 4; Rheem, No. 18 at p. 4; KeepRite, No. 17 at p. 2) Commenters provided several reasons why preparation room equipment should not be considered within the scope of walk-ins. AHRI stated that "these systems are not commonly enclosed" and that they are not for storage. (AHRI, No. 11 at p. 4) Other stakeholders provided variations on the "not enclosed" theme, including, for example, Rheem ("not always an enclosed space"), Hussmann ("often not enclosed," but also discusses the possibility that they are enclosed, i.e., "when enclosed, these are rooms where . . ."),

KeepRite and Manitowoc ("not commonly enclosed"), and Lennox ("are not 'enclosed storage spaces'"). (Rheem, Public Meeting Transcript, No. 23 at p. 58; Hussmann, No. 20 at p. 4; KeepRite, No. 17 at p. 2; Manitowoc, No. 10 at p. 2; Lennox, No. 13 at p. 8)

Regarding the issue of equipment use for food storage, Lennox commented that preparation rooms are areas where humans occupy the space to prepare and package food. (Lennox, No. 13 at p. 8) Hussmann commented that preparation rooms are places where work is being performed on the product, not places where finalized goods are stored. (Hussmann, No. 20 at p. 4) Other commenters, including Manitowoc, AHRI, KeepRite, and Rheem also stated that preparation rooms are not used for storage. (Manitowoc, No. 10 at p. 2; AHRI, No. 11 at p. 4; KeepRite, No. 17 at p. 2; Rheem, No. 18 at p. 3)

Several commenters suggested that DOE consider an alternative definition: "An open space or space without a sealed door (as defined in 10 CFR Part 431.302) that separates the interior volume of a unit of commercial refrigeration equipment from the ambient environment, designed for use in a room occupied by personnel who are preparing and packaging food. A preparation room is not designed for storage." (AHRI, No. 11 at p. 4) Similar definitions of preparation room or preparation space were suggested by Lennox, Rheem, and Manitowoc. (Lennox, No. 13 at p. 8; Rheem, No. 18 at p. 3; Manitowoc, No. 10 at pp. 2-3)

DOE notes that the WICF Term Sheet recommended that DOE develop a definition for "preparation room refrigeration" to focus on the refrigeration system, rather

than preparation spaces in general. (Docket EERE-2015-BT-STD-0016, Term Sheet, No. 56 at p. 3) This approach is reinforced by the agenda for the WICF Working Group meetings, which included as key issues, (a) proposed energy conservation standards for six classes of refrigeration systems, and (b) potential impacts on installers, neither of which addresses preparation spaces generally. 80 FR at 46523. Hence, DOE's intent in requesting comment on its definition of preparation room refrigeration was to solicit information regarding the characteristics of this equipment that would distinguish it from walk-in refrigeration systems. Discussion of the proposed characteristics appears below, but DOE notes that none of the comments received provided information regarding features that distinguish preparation room refrigeration systems from walk-in refrigeration systems. The emphasis of the commenters on the lack of an enclosure or the use of preparation room space for purposes other than storage does not represent any feature that distinguishes the refrigeration systems used in these two groups of equipment. As indicated in the NOPR, DOE had not identified any characteristics of preparation room refrigeration systems that would distinguish them from other walk-in refrigeration systems. The definition was primarily proposed in order to explore the recommendation of the WICF Working Group and to solicit information regarding distinguishing characteristics of this equipment. The definition was not proposed as the basis for an exclusion. 81 FR at 54937. Comments regarding the proposed distinguishing characteristics for this equipment are described in more detail below, but DOE notes that commenters did not believe the proposed characteristics could be used as the basis for distinguishing this equipment from other walk-in refrigeration equipment. Nor, as mentioned, did they provide alternative characteristics that could be used for this

distinction. With this final rule notice, DOE confirms, based on comments received, that the initial conclusion was correct that there are no clear distinguishing characteristics of preparation room refrigeration systems and other walk-in refrigeration.

Regarding the suggested alternative definitions based on non-refrigeration system-based characteristics, in DOE's view, these characteristics play no role in distinguishing those refrigeration systems used in preparation room applications from non-preparation room applications, since they describe preparation room space but do not address the refrigeration systems used for these spaces. Accordingly, DOE is declining to adopt these suggested changes to the proposed definition. Comments regarding the proposed distinguishing characteristics and DOE's responses are discussed in more detail below.

Distinguishing Characteristics of Preparation Room Refrigeration Systems

DOE received several comments regarding the characteristics it proposed including as part of the proposed definition of preparation room refrigeration to distinguish this equipment from non-preparation room refrigeration systems. AHRI stated that DOE's proposed definition is unclear and incorrect because the evaporator temperature specification does not indicate whether it is ambient or suction temperature, there is no quantified specification for "low outlet air velocity," and because these systems do not exclusively use electric or hot gas defrost. (AHRI, No. 11 at p. 4) Others made these same points. Manitowoc indicated that specifying the evaporator temperature does not clarify whether the temperature is ambient or suction temperature. (Manitowoc,

No. 10 at p. 3) Rheem and Lennox suggested that the evaporator temperature in the definition be clarified as the "saturated suction temperature". (Rheem, Public Meeting Transcript, No. 23 at p. 57; Lennox, Public Meeting Transcript, No. 23 at p. 58) Rheem, Manitowoc, Lennox, and KeepRite also commented that preparation room refrigeration systems may use air defrost, which argues in favor of not limiting the definition to gas or electric defrost units. Finally, Rheem, Manitowoc, Lennox, and KeepRite suggested that the "low air velocity" cited in the proposed definition should be more specifically defined. (Rheem, Public Meeting Transcript, No. 23 at p. 58; Rheem, No. 18 at p. 4; Manitowoc, No. 10 at p. 3; Lennox, No. 13 at p. 9; KeepRite, No. 17 at p. 2)

AHRI also requested that information related to preparation room refrigeration systems (beyond its suggested alternative definition) be removed in the final rule. (AHRI, No. 11 at pp. 4-5) Manitowoc also requested that DOE exclude all information related to preparation room refrigeration from the scope of this rulemaking. (Manitowoc, No. 10 at p. 3) Regarding the characteristics of preparation room refrigeration systems, in light of some of the limitations with the proposed definition and the absence of any specifications from commenters that would help with its clarification (e.g., specifying a "low outlet air velocity"), DOE is declining to adopt a definition for preparation room refrigeration at this time. In DOE's view, the alternative definitions suggested by commenters were insufficient since they failed to address the refrigeration system itself – i.e., the item which DOE sought to define. Accordingly, because of the absence of any meaningful way to distinguish these systems from non-preparation refrigeration systems, DOE will treat preparation room refrigeration systems as falling within the scope of walk-in refrigeration systems and being subject to the standards and reporting

requirements that apply. DOE may revisit this issue in the future if an appropriate definition distinguishing such equipment can be developed.

j. Storage Space

Consistent with the Term Sheet, DOE proposed to define “refrigerated storage space” in the context of the current definition for a walk-in as “a space held at refrigerated (as defined in 10 CFR 431.302) temperatures.” 81 FR at 54937.

Hussmann suggested modifying the proposed "refrigerated storage space" definition to reflect WICF room intent, which is to "maintain product at a specific temperature for storage purposes." 81 FR at 54937. Hussmann argued that making this change would help clarify the difference between WICF rooms and process rooms, because, in its view, the term "maintain" would specify the presence of a holding area with the equipment – rather than equipment that imparts any changes on the products placed inside of it.

While the proposed definition does not delineate a difference between equipment that is subject to standards and equipment that is not subject to standards, as discussed earlier in section III.A.1.h of this final rule, DOE does not interpret the phrase “held at temperatures” to mean that the equipment is held at a constant temperature. Instead, DOE views this term as referring to a temperature at or below the 55 °F specified for “refrigerated” as defined in 10 CFR 431.302. Accordingly, DOE is finalizing the definition as proposed.

2. Refrigeration System Test Procedure Modifications

a. Hot Gas Defrost

Reflecting Recommendation #3 of the WICF Term Sheet (Docket EERE-2015-BT-STD-0016, Term Sheet, No. 56 at p. 2), DOE proposed to amend the test procedure by removing the method for calculating the defrost energy and heat load of a system with hot gas defrost. 81 FR at 54937-54938. With this change, manufacturers of refrigeration systems with hot gas defrost would be unable to take account of that feature in testing or rating their systems when using the DOE test procedure. Id.

All commenters agreed with the proposed removal of the hot gas defrost credit in the test procedure. Rheem and Heat Controller agreed that the credit should be removed from the efficiency calculation because it unfairly favored systems using hot gas defrost over comparable electric defrost systems. (Rheem, Public Meeting Transcript, No. 23 at p. 64; Heat Controller, Public Meeting Transcript, No. 23 at p. 66) Lennox and KeepRite also agreed with removing the hot gas defrost credit. (Lennox, No. 13 at p. 9; KeepRite, No. 17 at p. 2)

However, Rheem and the CA IOUs also argued that, because the proposed approach would fail to quantify the energy used by hot gas systems during the defrost cycle, thereby eliminating any accounting of the energy use contribution for defrost in the test procedure calculations, the proposed change would still unfairly favor hot gas defrost systems. (Rheem, Public Meeting Transcript, No. 23 at pp. 60-61; CA IOUs, No. 21 at p. 3) The CA IOUs encouraged DOE to ensure that WICF equipment with hot gas defrost and electric defrost are treated fairly within the test procedure. (CA IOUs, No. 21 at p. 3)

ASAP and NEEA agreed, adding that unit coolers with only hot gas defrost should be required to meet a performance level equivalent to unit coolers with improved evaporator fan blades and off-cycle variable-speed evaporator fans. (ASAP and NEEA, No. 19 at p. 3)

Rheem and Manitowoc asserted their belief that the removal of the hot gas defrost credit would correspondingly remove the need for manufacturers to certify the performance of this equipment. (Rheem, Public Meeting Transcript, No. 23 at p. 63; Manitowoc, No. 10 at p. 3) KeepRite also supported the removal of the certification requirements for these systems. (KeepRite, No. 17 at p. 2) In response, DOE notes that the requirement to test and certify hot gas defrost walk-in refrigeration systems was adopted by the May 2014 test procedure final rule and the June 2014 energy conservation standard final rule—this is not a new requirement. The Fifth Circuit Order did not strike the requirement for certification of performance for any refrigeration systems on or after their standards compliance date. The discussions during the Working Group meetings did not address relief of testing and certification requirements for this equipment—hence, these requirements still stand, regardless of the removal of the hot gas defrost credit.

DOE notes that the NOPR public meeting attendees briefly discussed ways to assign an AWEF level to a hot gas defrost refrigeration system during the public meeting and in a separate meeting between DOE and industry representatives (Ex Parte Communication of September 29, 2016 Meeting, No. 6). When asked whether there would generally be an equivalent electric defrost model whose AWEF rating could be used for any given hot gas defrost model, Rheem noted that most hot gas defrost models

have a comparable electric defrost model. (Rheem, Public Meeting Transcript, No. 23 at p. 62) However, Bally commented that the individual models sometimes are part of different basic models. Rheem and Bally added that significant clarification would be needed to specify how a proxy rating system would work to avoid misinterpreting the regulation. (Rheem, Public Meeting Transcript, No. 23 at p. 62; Bally, Public Meeting Transcript, No. 23 at p. 64)

Commenters suggested ways to assign an AWEF value for hot gas defrost units. AHRI and Hussmann suggested permitting manufacturers to assign the minimum allowable AWEF to a hot gas refrigeration system. (AHRI, No. 11 at p. 5; Hussmann, No. 20 at p. 4) However, commenters also offered an alternative to this approach, which would allow manufacturers to assign the AWEF value of an equivalent electric defrost unit to the hot gas defrost unit. AHRI and multiple manufacturers suggested, without offering any supporting details or reasoning, that equivalence in this context be defined as an electric defrost system within 10 percent of the rated net capacity of the hot gas defrost unit. (AHRI, No. 11 at p. 6; Manitowoc, No. 10 at p. 3; NCC, No. 16 at p. 2; Lennox, No. 13 at p. 4; Rheem, No. 18 at p. 4; Hussmann, No. 20 at p. 4) ASAP and NEEA agreed that using equivalent electric defrost units as surrogates for rating hot gas defrost units would address the concerns with the proposed test procedure. (ASAP and NEEA, No. 19 at p. 3) The CA IOUs also agreed with this approach, but presented another alternative: apply a default defrost energy consumption value for hot defrost units based on their refrigeration capacity. (CA IOUs, No. 21 at p. 3) The CA IOUs offered no

further detail on how to determine this value.[9] KeepRite suggested that the hot gas defrost unit should be assigned the AWEF of an equivalent electric defrost unit and also be part of the same basic model as that electric defrost unit. (KeepRite, No. 17 at p. 2) ASAP, NEEA, the CA IOUs, and KeepRite did not offer any definition for equivalence. AHRI and Rheem noted that if being a part of the same basic model were a requirement of equivalence, the definition for basic model would have to be altered, because the defrost type affects the equipment's energy consumption (see definition in 10 CFR 431.302). (AHRI, No. 11 at p. 6; Rheem, No. 18 at p. 2)

Commenters also offered a few methods for dealing with cases where there is no equivalent unit. Manitowoc suggested that, in these cases, the AWEF value be determined based on interpolation between electric defrost units with higher and lower capacities -- which would create a weighted average of the AWEFs of the two electric defrost units). (Manitowoc, No. 10 at p. 3) Lennox suggested using an AEDM, which would use a calculated energy contribution for defrost and apply it to the hot gas defrost unit's calculated performance as if it were an electric defrost unit. (Lennox, No. 13 at p. 4) AHRI and Rheem argued that the model should be rated with the minimum AWEF value (as defined in 10 CFR 431.306) in these cases. (Rheem, No. 18 at p. 2; AHRI, No. 11 at p. 6)

[9] DOE suspects that the CA IOUs may have meant to suggest using an approach similar to the assignment of electric defrost energy use and heat load that is used for testing of dedicated condensing units (see paragraphs 3.4.2.4 and 3.4.2.5 of subpart R, appendix C of 10 CFR part 431, as finalized in this notice).

Some commenters recommended separate approaches for condensing units and unit coolers. NCC suggested that a hot gas defrost condensing unit should be tested as an electric defrost model by first removing all mechanical components associated with hot gas defrost functions. (NCC, No. 16 at p. 1) For this approach, the proposed test procedure would specify standardized values for the electric defrost energy use and heat addition. See, e.g., 10 CFR 431, subpart R, appendix C, section 3.4.2.4 as proposed, 81 FR at 54958. For a unit cooler, NCC recommended using the AWEF of an equivalent electric defrost model, which it defined as an electric defrost model having a net capacity within 10 percent of that of the hot gas defrost unit, and that also belongs to the same basic model group. If an equivalent model is not available, NCC recommended that the manufacturer petition DOE for a test procedure waiver. (NCC, No. 16 at p. 2)

Regarding the suggestions that AWEF ratings for hot gas defrost units not be required, in DOE's view, such an approach would likely remove any incentive for manufacturers to design and build hot gas defrost equipment that would maintain steady state efficiency in a manner consistent with the standards that apply to electric defrost systems since, under this approach, the unit's design has no influence on whether it complies with the applicable electric defrost system standard. Similarly, simply assigning a baseline AWEF value to the unit fails to impose any requirements on the units' efficiencies, since a default value would be applied to this equipment, which again would make compliance unrelated to the unit's design.

Further, while using the AWEF of an equivalent electric defrost unit to rate hot gas defrost units may have merit, DOE does not have, and the commenters did not

provide, any information demonstrating how the use of the suggested 10-percent range would impact manufacturer incentives to use efficient designs. This suggested equivalence criterion, if adopted, would play little to no role with respect to the energy use of the unit's components, such as the energy use of a unit cooler's evaporator fan. A smaller evaporator coil with greater fan power and more air flow could provide the same net capacity as a larger coil with less fan power and air flow, but use more fan power to do it.

In addition, comparing the net capacity of the hot gas defrost unit with those of electric defrost units to test equivalency implies that it is understood how to determine that value. As discussed in the comments, net capacity as measured in the test procedure is not the same as capacity reported for application ratings. See, e.g., AHRI, No. 0011 at p. 3 (discussing application temperature points). A manufacturer using the suggested approach could claim an unlikely net capacity in order to be within 10% of the net capacity of an electric defrost unit with a high AWEF. Further, a manufacturer could (without any verification) select the highest AWEF of electric defrost units within the +/- 10 percent range. But since the design of the unit also has little or no bearing on whether it is compliant with the standards under this approach, it only shows that a given hot gas defrost unit has a claimed net capacity within ten percent of the net capacity of a compliant electric defrost unit.

Regarding the suggested use of an AEDM along with a prescribed value for the energy consumption from defrost usage, DOE notes that an AEDM simulates a unit's performance during testing, which requires that there first be a test procedure that the

AEDM would simulate. Because there is no hot gas defrost test procedure, this approach would also be unworkable unless a test procedure were first developed and defined. In short, DOE agrees with Rheem and Bally that significant clarification would be needed to specify how a proxy rating system would work to avoid misinterpreting the regulation. For the reasons described earlier, however, DOE is not convinced that the suggested "within 10 percent of net capacity" provides sufficient clarification.

NCC's comment addressed possible approaches for testing hot gas defrost condensing units and unit coolers. But because coverage also extends to matched-pair or single-package systems, a hot gas defrost test approach must also be developed for these system categories.

After considering various possibilities for developing procedures to test hot gas defrost features, as discussed above, DOE continues to believe a test that measures the energy benefits of hot-gas defrost is not warranted at this time. Accordingly, DOE is adopting, in this respect, an approach consistent with the intent of the one set forth in the NOPR. Namely, a manufacturer will test a hot gas defrost condensing unit without measuring the impacts of the hot gas defrost feature, and that feature will not affect the rated efficiency either positively or negatively. In that sense, the test procedure for units with hot gas defrost will be the same as the test procedure for units with electric defrost.

DOE is clarifying one aspect of the test procedure with respect to hot gas defrost. DOE recognizes that the hot gas defrost components can impose pressure drop on the refrigerant lines during the test, which can reduce performance. This issue was discussed

in the WICF Working Group meetings, where the addition of a pressure drop equivalent to 3 °F dew point reduction in the suction line was included in the initial engineering analysis developed for hot gas defrost units to reflect this issue. (Docket EERE-2015-BT-STD-0016, Working Group Meeting Presentation, Fifth and Sixth Meetings: Engineering Analysis, No. 26 at p. 34) (The hot gas defrost calculations were subsequently removed from the engineering analysis because hot gas defrost was not considered as a design option.) Thus, the presence of hot gas defrost components would cause the hot gas defrost feature to detract from a model's rated efficiency. That outcome would be inconsistent with the approach DOE set forth in the NOPR, the purpose of which was to make rated efficiencies neutral with respect to the presence of hot gas defrost. While DOE does not have information to support a general presumption that hot gas defrost increases efficiency by a particular amount, it does not believe that hot gas defrost ordinarily decreases efficiency in operation. Accordingly, DOE will permit a manufacturer to remove the hot gas defrost components. Thus, incorporating hot gas defrost in a condensing unit will not cause a decrease in the unit's rated efficiency under the test procedure.

However, DOE recognizes that simply removing the hot gas defrost components may not be sufficient to set up a condensing unit for a test, since removal of a component may leave pipe ends open to the surroundings. Some of these pipe ends may have to be capped or connected with each other, and at least two ends represent the suction inlet and liquid outlet of the condensing unit. Also, some of the hot gas defrost components may make little impact to the operation of the system and accompanying measurement – which would encourage a manufacturer not to remove those components. To ensure that

any third party testing is conducted consistently with manufacturer testing or its recommendations for testing, information to clarify which components are removed and the subsequent piping connections may have to be provided. DOE will consider proposing in a future rulemaking that certification reporting for hot gas defrost units include as non-public information a list of the hot-gas-defrost components that must be removed for the test and instructions for piping connections to allow proper testing. DOE may also consider allowing any such instructions to be provided in pdf form as supplementary test information. The regulations being adopted are generic in nature such that manufacturers (and other stakeholders that utilize the test procedure) should have sufficient instruction on how to test all basic models that have hot-gas defrost components.

Further, DOE is also adopting this approach for testing hot gas defrost unit coolers, matched-pairs, or single-package refrigeration systems. For these systems, the hot gas defrost components would also be removed from the system, and pipes reconnected as required. The units would be tested measuring steady state performance, but frosting or defrost tests would not be feasible under this approach and they would not be run. Using this procedure, the test chambers would have to be operated with low moisture levels to prevent frost formation during testing. Performing this test will generally require using test facilities with conditioning systems that can cool down the indoor room and remove its moisture before operation of the unit under test can start to ensure that the test unit does not collect any moisture from the room. It also requires that infiltration into the indoor room be minimized. The defrost heat and energy use for the test would be calculated in the same manner as for an electric defrost condensing unit

tested alone, thus allowing determination of equivalent AWEF. DOE has adopted this approach for hot gas defrost refrigeration systems in 10 CFR 431, subpart R, appendix C.

Although some test facilities may not be equipped with conditioning systems that would allow cooling of the indoor room and removal of moisture prior to start of the test unit, DOE expects that some manufacturers will develop performance representations for their hot gas defrost units using AEDMs, as suggested by some of the comments, and that there may be limited need for the actual testing of hot gas defrost unit coolers and matched-pairs under this approach. The AEDMs would only need to be able to estimate the steady state performance of the systems in refrigerating mode, since they would, like the test, use the standardized contributions for hot gas defrost energy input and heat addition.

Heat Controller emphasized the need to develop a test method to quantify the differences between various defrost technologies. (Heat Controller, Public Meeting Transcript, No. 23 at p. 66) Lennox also supported the development of a method to determine the AWEF for hot gas defrost models. (Lennox, No. 13 at p. 4) DOE notes that WICF Term Sheet Recommendation #6 would involve DOE initiating a future test procedure rulemaking to adopt test procedure provisions for several items, including hot gas defrost. Developing and adopting such a test procedure would enable one to differentiate between technologies. DOE plans to address this issue in the future.

b. Adaptive Defrost

Consistent with the Recommendation #4 of the WICF Term Sheet (Docket EERE-2015-BT-STD-0016, Term Sheet, No. 56 at p. 2), DOE proposed to amend the test procedure so that the provisions for assigning a benefit to adaptive defrost cannot be used to certify compliance with the energy conservation standard. 81 FR at 54938-54939.

DOE did not receive any comments regarding this proposal and is adopting the proposed amendment.

c. On-Cycle Variable-Speed Evaporator Fan Control

Consistent with Recommendation #4 of the WICF Term Sheet (Docket EERE-2015-BT-STD-0016, Term Sheet, No. 56 at p. 2), DOE proposed to amend the test procedure so that unit cooler compliance with the applicable walk-in refrigeration system standard would be assessed without using on-cycle variable-speed evaporator fans. As part of this approach, manufacturers would be permitted to make representations of the energy efficiency or consumption for a unit cooler basic model using on-cycle variable-speed fans as measured in accordance with the DOE test procedure, provided that the additional represented value has been certified to DOE per 10 CFR 429.12.

DOE did not receive any comments regarding this proposal and is adopting it in this final rule.

B. Actions to Facilitate Implementation of Energy Conservation Standards

1. Re-organization and Clarification of the Test Procedure for Walk-in Refrigeration Systems, Doors, and Panels

DOE proposed to re-organize the walk-in test procedure found at 10 CFR 431.304 into three separate appendices, one for each metric corresponding to the regulated component. DOE proposed to revise Appendix A to Subpart R of Part 431 by designating it as, and retaining only the procedure for, measuring the energy consumption (in kWh/day) for walk-in doors. DOE also proposed to create a new Appendix B to Subpart R of Part 431, which would contain the method of measuring the R-value, which would apply to walk-in doors and panels. Lastly, DOE proposed creating a new Appendix C to Subpart R of Part 431, which would contain the test method for refrigeration systems. In addition, DOE proposed to clarify some of the definitions and terminology used in the test procedure.

Specifically, DOE proposed to revise Appendix A to Subpart R of Part 431, which contains the procedure for measuring energy consumption (in kWh/day) for display and non-display doors, by removing the definitions and references related to walk-in panels. DOE proposed to (1) remove the definition of "core region," (2) move the definition of "edge region" to the proposed Appendix B, and (3) remove the prescribed subfloor temperature listed in Table A.1 of Appendix A. Further, DOE proposed to amend the definition of "surface area" by removing the currently inserted example referencing walk-in panels and modifying the definition of "rating condition" by removing the discussion of internal walk-in components. 81 FR at 54939. These

amendments were intended to clarify Appendix A and did not substantively change the DOE test procedure for measuring the energy consumption of walk-in doors.

To clarify how to calculate door power usage, DOE proposed defining "rated power" as the electricity-consuming device's power as specified on the device's nameplate. If the device does not have a nameplate or such nameplate does not list the device's power, then the rated power must be read from the device's product data sheet. See 81 FR at 54939. In addition, DOE proposed that, for each basic model of walk-in door that has an electricity consuming device(s) for which rated power is taken from a product data sheet, the walk-in door manufacturer must retain the product data sheet as part of the test data underlying the walk-in door's certification report. 81 FR at 54939.

Hussmann expressed concern about how to calculate the rated power for certain variable-power door components, like variable-resistance heaters and door-opening devices. In its view, the proposed definition for rated power, which would require manufacturers to use 100% of a device's rated power, does not make sense when applied to variable power devices that have a lower average power. (Hussmann, Public Meeting Transcript, No. 23 at pp. 73-74) In sections 4.4.2 and 4.5.2 of Appendix A to Subpart R to Part 431, DOE's current test procedure details how to calculate the power usage for each type of electricity consuming device used in a walk-in door. The procedure includes percent time off values to account for energy saving features like timers, control system, or other auto-shut-off system. These values also reduce the calculated power usage for features that are not constantly operational, e.g., lighting without controls is assigned a 25% percent time off. As a result, in DOE's view, the procedure, as modified by the

proposal, would sufficiently account for the lower energy use conditions identified by Hussmann. Accordingly, DOE is adopting its proposed definition for rated power. DOE notes that if a manufacturer believes that the test procedure is unrepresentative of a walk-in door basic model's energy use, it may avail itself of the test procedure waiver provisions of 10 CFR 431.401 to obtain approval to use an alternative test procedure when measuring the energy efficiency of its equipment.

Additionally, DOE proposed adding a new Appendix B to Subpart R of Part 431 to improve the clarity of the walk-in test procedure. This appendix would include the currently prescribed method of measuring the R-value found in 10 CFR 431.304. Specifically, DOE proposed to move the provisions found at 10 CFR 431.304(b) and (c) into Appendix B. DOE also proposed to add the definition of "edge region" that was previously located in Appendix A to Subpart R of Part 431 to Appendix B, as this definition is relevant to the R-value test method.

Dow supported the creation of Appendix B to Subpart R of Part 431, commenting that this change would help highlight the fundamental differences between doors and panels and clarify how each are treated in the proposed and future test procedures. (Dow, No. 9 at p. 2) In addition, Dow commented that it understood that the R-value for insulation used in WICF-related panels and doors must be determined in accordance with the WICF test procedures in Appendix B to Subpart R of Section 431 and sought confirmation of the accuracy of this understanding from DOE. (Dow, No. 9 at p. 3)

DOE did not receive any negative comments regarding the re-organization of Appendix A and proposed addition of a new Appendix B to Subpart R of Part 431.

Appendix B to Subpart R of Section 431 as adopted in this final rule contains the test method for measuring the R-value of insulation. This test method must be used when determining the R-value for walk-in panels and doors.

With respect to the proposed amendments regarding Appendices A and B, Dow supported the inclusion of ASTM C518-04 in the test procedure but recommend updating the procedure to reference the new version of this standard, ASTM C518-10. (Dow, No. 9 at p. 2) In this rulemaking, DOE proposed to make only editorial changes to the test procedure for measuring R-value but may consider Dow's suggestion to reference the most recent version of ASTM C518 in a future rulemaking.

DOE also proposed to add a new Appendix C to Subpart R of Part 431 and include the test method for refrigeration systems in this appendix. Within Appendix C, DOE further organized its discussion of test procedures in terms of the refrigeration system configuration types – i.e. matched-pairs, single-package dedicated systems, individually distributed unit coolers and condensing units. Within Appendix C, DOE proposed to incorporate the (1) provisions that are currently included in 10 CFR 431.304, sections (10) through (12), which specify that walk-in refrigeration systems be tested using AHRI 1250-2009 -- the test procedure incorporated by reference in 10 CFR 431.303 – and (2) clarify and modify certain provisions of the test procedure. One subsection would contain the general modifications to the test conditions and tolerances

applied to the industry test procedure that were incorporated into DOE's May 2014 test procedure rule. 79 FR at 27399-27403. A second subsection would contain proposed modifications to the method of test and the remaining subsections addressed proposed modifications specific to the system configuration types. 79 FR at 27398-27399. The NOPR also proposed, and this final rule adopts, adding to Appendix C the modifications to the test procedure for walk-in refrigeration systems that are discussed in section III.A.2. See 81 FR at 54956-54958.

DOE also proposed to correct typographical errors in the regulatory text contained in the proposed Appendix C. DOE proposed to correct the saturated suction A and saturated suction B temperatures to be −20 °F and −26 °F, respectively, in the table currently in 10 CFR 431.304(c)(10)(xv). 81 FR at 54939. DOE also proposed correcting an equation for defrost heat load contribution currently at 10 CFR 431.304(c)(12)(ii). The equation for defrost heat load contribution currently specifies that this contribution should be divided by 3.412 Btu/W-h, but it should instead be multiplied by 3.412 Btu/W-h. 81 FR at 54939-54940.

DOE did not receive any comments regarding its proposal to add a new Appendix C to Subpart R of Part 431 or its proposal to include the test method for refrigeration systems in this same appendix. DOE did not receive any comments in response to its proposal to correct typographical errors within the test procedure language or equation that would become part of the proposed Appendix C. Therefore, DOE is adopting its proposed changes in this final rule.

2. Representation Requirements

DOE proposed to amend the representation requirements for refrigeration systems to clarify how to apply the test procedure to the range of possible kinds of refrigeration systems. Specifically, DOE proposed to direct manufacturers of unit coolers, dedicated condensing units, single-package dedicated systems, and matched refrigeration systems to the appropriate subsections of Appendix C to Subpart R of Part 431—the DOE test procedure for refrigeration systems. DOE also proposed not to require the rating of a matched refrigeration system if the constituent unit cooler(s) and dedicated condensing unit have been tested and rated separately. However, if a manufacturer wished to represent the efficiency of the matched refrigeration system separately from the efficiency of either constituent component, or if the manufacturer cannot rate one or both of the constituent components using the specified method (e.g., if the system has a variable-capacity condensing unit, thereby preventing the manufacturer from being able to test the condensing unit individually), the manufacturer must test, represent, and certify the matched refrigeration system as specified in this section. A component that is part of a certified matched-pair and that has not been rated individually cannot be sold individually, nor can it be sold as part of a different matched-pair (that is, with a different component matched to it) unless that new matched-pair has also been tested and certified. DOE did not receive any comments on these proposed requirements and is adopting them in this final rule.

3. Certification and Compliance Requirements

DOE explained in its proposal that a manufacturer of a walk-in cooler or walk-in freezer is any person who: (1) manufactures a component of a walk-in cooler or walk-in

freezer that affects energy consumption, including, but not limited to, refrigeration, doors, lights, windows, or walls; or (2) manufactures or assembles the complete walk-in cooler or walk-in freezer. 10 CFR 431.302.

Several of the statutory standards, as well as DOE's 2014 standards and any energy conservation standards that DOE may adopt in its separate ongoing rulemaking (see Docket No. EERE-2015-BT-STD-0016), apply to specific components of a walk-in. A manufacturer of a walk-in component (i.e., part 1 of the definition of a manufacturer of a walk-in cooler or walk-in freezer) is the entity that manufactures, produces, assembles or imports a walk-in panel, door or refrigeration system. A manufacturer of a walk-in component is responsible for ensuring the compliance of the component(s) it manufactures. DOE requires a manufacturer of a walk-in component to certify the compliance of the components it manufactures.

A manufacturer of a complete walk-in (i.e., part 2 of the definition of a manufacturer of a walk-in cooler or walk-in freezer) is the entity that manufactures, produces, assembles or imports a walk-in cooler or freezer (i.e., an enclosed storage space meeting the definition of a walk-in cooler or freezer). This includes “installers” of complete walk-ins. Although DOE does not require a manufacturer of a complete walk-in to certify the compliance of the “box” as a whole, a manufacturer of a complete walk-in must ensure that the walk-in, including all of its regulated constituent components, meets applicable statutory and/or regulatory standards. After the compliance date of any amended performance-based walk-in cooler or freezer standard (i.e., either those noted in the concurrent WICF refrigeration system standards rulemaking or those currently in the

regulation for which compliance is required in 2017), manufacturers of complete walk-ins may continue to assemble and install walk-ins using components remaining in inventory that were manufactured before the compliance date for the amended performance-based component standards. DOE emphasizes that the components must have been compliant with all requirements and certified to DOE before the compliance date of such component's amended standard. A more detailed discussion of this will appear in the related standards final rule. See Docket No. EERE-2015-BT-STD-0016. If a manufacturer of a complete walk-in also meets part 1 of the definition (i.e., it also manufactures individual components), then it must certify the compliance of the components it manufactures. Compliance responsibilities for manufacturers of complete walk-ins are discussed in more detail later in this section.

Dow stated that the certification and compliance requirement language regarding doors, walls, ceiling, and floor panels/components is not clear. It noted that some WICF floors, which are considered "panels" under DOE's regulations are not, in fact, separate pre-assembled panels but are built into the floor of the building in which the WICF is located. In this case, Dow noted that the floor would be a component of the WICF but not a "panel." (Dow, No. 9 at p. 1) Dow also noted that, although WICF panels consist of an assembly of materials (metal skins, insulation, fasteners, etc.), the text refers to insulation material alone as a panel, which, in its view, adds confusion on how to apply the test procedure. (Dow, No. 9 at p. 2)

DOE agrees with Dow's comments that a WICF floor may comprise pre-assembled panels or layer(s) of insulation and/or some other floor covering material (e.g.,

concrete). DOE notes that the definition for "panel" includes any "construction component that is not a door and is used to construct the envelope of the walk-in, i.e., elements that separate the interior refrigerated environment of the walk-in from the exterior." (10 CFR 431.302) Therefore, a WICF floor built from layer(s) of insulation and floor-covering material would satisfy the definition since it contains "elements that separate the interior refrigerated environment of the walk-in from the exterior." Id.

a. Manufacturers of Walk-in Components

A manufacturer of a walk-in component must ensure that the component meets the applicable standard. In the August 2016 NOPR, DOE proposed to modify this current approach (detailed at 10 CFR 429.12(b)(6)) by requiring that for each brand name, a walk-in manufacturer must submit both the basic model number and the manufacturer's individual model number(s). When it first established reporting requirements for walk-ins, DOE explained that it was adopting a limited approach since it did not have sufficient information at the time to determine whether reporting individual model numbers for walk-in components was feasible. See 76 FR 12422, 12466 (March 7, 2011) ("March 2011 CCE Rule"). DOE noted that it would revisit this issue in the future. Id. As part of their certification of compliance responsibilities, manufacturers have routinely submitted both basic model numbers and individual model numbers for walk-in refrigeration systems, panels, and doors. These submissions suggest that it is feasible for manufacturers to certify both basic model numbers and individual model numbers for each brand. Accordingly, DOE proposed to require that a walk-in manufacturer include individual model number(s) as part of its reporting submission.

AHRI, Manitowoc, Rheem, Zero Zone, NCC, and KeepRite opposed DOE's proposal to expand the model number reporting requirements. (AHRI, No. 11 at p. 3; Manitowoc, No. 10 at p. 2; Rheem, No. 18 at p. 6; Zero Zone, No. 15 at p. 2; NCC, No. 16 at p. 6; KeepRite, No. 17 at p. 2) AHRI, Manitowoc, and Rheem disagreed with DOE's observation that manufacturers routinely submit both basic and individual model numbers for WICF systems, noting that this is not the case for all manufacturers or types of equipment. (AHRI, No. 11 at p. 3; Manitowoc, No. 10 at p. 2; Rheem, No. 18 at p. 5) AHRI, Manitowoc, Rheem, NCC, and KeepRite also noted that the proposed reporting change will greatly increase the number of models listed in DOE's Certification Compliance Management System ("CCMS") because there may be hundreds of combinations for a given basic model, and make the database more difficult for customers to navigate. (AHRI, No. 11 at p. 3; Manitowoc, No. 10 at p. 2; Rheem, No. 18 at pp. 5-6; NCC, No. 16 at p. 6; KeepRite, No. 17 at p. 2) Bally commented that DOE also needs to consider the effect of an increase in door basic models as a result of the new energy conservation standard going into effect on June 3, 2017. Once the maximum energy consumption metric becomes effective many variables such as door area, U-value, and power consumption will impact door basic models. Separating its models by door area alone, Bally states that it has 63 different combinations. (Bally, No. 22 at p. 1) NCC asserted that it may have to recertify daily because it manufactures so many custom products. (NCC, No. 16 at p. 6) Hussmann and KeepRite commented that the proposed requirement would significantly increase the complexity of reporting, which would result in the reporting of hundreds of model numbers. (Hussmann, No. 20 at p. 3; KeepRite, No. 17 at p. 2) Zero Zone commented that the additional model number reporting

requirements would increase paper work for the manufacturers without providing any value to customers. (Zero Zone, No. 15 at p. 2)

Lennox argued that the proposed individual model number reporting requirement would be burdensome unless it was allowed to group its individual model numbers using the “wildcard” digit placeholders it currently uses when reporting. (Lennox, Public Meeting Transcript, No. 23 at pp. 70-71) Hussmann added that allowing placeholder digits (“wildcards”) for both AWEF-altering and AWEF-agnostic model changes would simplify the reporting process, allow for a clean transition to marketing materials, and clarify the rating system for consumers. (Hussmann, No. 20 at p. 3) Rheem and NCC similarly advocated for the use of placeholder characters (e.g., "*") in model numbers to represent design options that do not materially affect the reported efficiency performance. (Rheem, No. 18 at p. 5; NCC, No. 16 at p. 6) NCC also requested clarification on the use of wildcards for individual model numbers and basic model numbers. (NCC, Public Meeting Transcript, No. 23 at pp. 76-77)

DOE acknowledges that its proposal requiring manufacturers to report the basic model number and individual model number(s) for each brand distributed in commerce may result in an increase in reporting burden. However, as explained in the August 2016 NOPR, DOE believes the additional burden to be minimal. 81 FR at 54940. DOE disagrees with the comments from AHRI, Manitowoc, and Rheem that manufacturers are not currently reporting individual model numbers. As of October 2016, each basic model

listed in DOE's Compliance Certification Database[10] lists an individual model number. Examples of certifications that have both basic model numbers and individual model numbers can be found in this rulemaking's docket. (See EERE - Compliance Certification Database, Walk-ln Coolers and Freezers Refrigeration Systems Screenshots, No. 27 at p. 1) Further, as all certifications appearing in DOE's Compliance Certification Database already include a basic model and individual model number, DOE does not agree with AHRI, Manitowoc, Rheem, NCC, and KeepRite that the proposed reporting change will greatly increase the number of models.

However, as requested by Lennox, Hussmann, and NCC, manufacturers may use wildcards to represent non-energy consuming features when certifying individual model numbers. Wildcards may not be used to represent energy consuming components that would result in a different representative value, but manufacturers may elect to group those individual models into one basic model at their discretion. Based on the comments received from Lennox and Hussmann, DOE understands that allowing wildcards will simplify the requirement to report individual models and will alleviate the concerns noted by AHRI, Manitowoc Foodservice, Rheem, Zero Zone, NCC, KeepRite, Bally, and Hussmann. Therefore, with the clarifications noted in this paragraph, this rule will require walk-in component manufacturers to submit both the basic model number and the manufacturer's individual model number(s).

[10] DOE's Compliance Certification Database can be found at: www.regulations.doe.gov/certification-data/#q=Product_Group_s%3A*.

With respect to the issue of energy-consuming components, Hussmann questioned whether individual models with design differences that are small but affect the units' energy consumption (e.g., one model with full electric heaters and another model with only a drain pan heater) could be grouped under the same basic model number under the lowest AWEF rating in the group. (Hussmann, Public Meeting Transcript, No. 23 at pp. 71-72) DOE refers Hussmann to the March 2011 CCE Rule where it established the basic model concept for walk-in coolers and freezers. That rule explained that the basic model concept permits flexibility in determining how manufacturers choose to group individual models with essentially, but not exactly, identical energy efficiency characteristics. DOE encouraged manufacturers to adopt a reasonable approach to basic model groupings and to certify as a single basic model those individual models that possessed only superficial differences, such as product finishes. The Department clarified that all models identified in a certification report as being the same basic model must have the same certified energy efficiency or consumption rating. Additionally, any individual model that is modified in a manner resulting in performance that is less efficient (or more consumptive) than the rated level when tested in accordance with the DOE test procedures in Parts 430 and 431 and the applicable sampling plans in Part 429 must be re-rated as a new basic model and certified to DOE. Certified ratings must be supported by tested values that are at least as efficient as the rating when the applicable sampling plans in Part 429 are applied. 76 FR at 12429.

DOE also proposed adding reporting requirements for both the standards promulgated in the June 2014 final rule (with a June 2017 compliance date) and for the standards for certain equipment classes of walk-in refrigeration systems that will be

defined in a separate energy conservation standards rulemaking (see Docket No. EERE-2015-BT-STD-0016).

In addition to the reporting requirements defined in 10 CFR 429.53(b), DOE proposed requiring certification reports to include the following product-specific information to show compliance with the amended energy conservation standards:

—Doors: Rated energy consumption, rated surface area in square feet, the rated power of each light, heater wire, and/or other electricity consuming device associated with each basic model of display and non-display door, and whether such device(s) has a timer, control system, or other demand-based control reducing the device's power consumption.

—Refrigeration systems: Rated annual walk-in energy factor (AWEF), rated net capacity, and the configuration tested for certification (e.g., condensing unit only, unit cooler only, or matched-pair).

ASAP and NEEA supported the proposed expansion of reporting requirements for doors and other WICF components, and agreed with DOE that this information is necessary to allow DOE to verify the door's rated energy consumption. (ASAP and NEEA, No. 19 at p. 3)

KPS commented that the new reporting requirements are burdensome to WICF OEMs that do not manufacture all door options and other power-rated accessories or any

nonstandard option. In its view, this information is dynamic and may change with each order. KPS asked if the WICF OEM can rely on each of the relevant vendors to meet the component testing requirements and be in compliance with DOE. (KPS, No. 8 at p. 1) A manufacturer of a walk-in component (i.e., the entity that manufactures, produces, assembles or imports a walk-in panel, door or refrigeration system) is responsible for ensuring the compliance of the component(s) it manufactures. A manufacturer of a complete walk-in must ensure that the walk-in, including all regulated constituent components, meets applicable statutory and/or regulatory standards. That is, a manufacturer of a complete walk-in is required to use components that comply with the applicable standards and have been certified as compliant, and must ensure the final product satisfies the statutory design requirements.

Bally suggested that manufacturers of door components (e.g., display windows) should be responsible for verifying the U- value of their products, rather than having the testing burden rest with refrigeration door manufacturers. (Bally, Public Meeting Transcript, No. 23 at p. 75) Similarly, as noted earlier, Dow commented that it understood from the proposal that the insulation supplier is not responsible for certifying and reporting the R-value of the finished panels, but is responsible for providing the panel or component manufacturer with accurate R-value testing results of the insulation supplier's material. Dow requested that DOE further clarify the role of the insulation supplier in the certification and compliance process. (Dow, No. 9 at p. 3)

Walk-in cooler and walk-in freezer manufacturers may rely on test data developed by other entities that supply sub-assemblies of a walk-in component (e.g., insulation

suppliers or display window suppliers). However, the manufacturer of a walk-in component (i.e., the entity that manufactures, produces, assembles or imports a walk-in panel, door or refrigeration system) is responsible for ensuring the compliance of the component(s) it manufactures.

DOE's new certification requirements will provide comprehensive, up-to-date efficiency information about walk-in equipment sold in the United States at any given time—a necessary predicate to an effective enforcement program. This rule adopts these new certification regulations for walk-in doors and refrigeration systems to ensure that DOE has the information it needs to ensure that regulated products sold in the United States comply with the law. As discussed in section III.A.1.d of this final rule, DOE is also requiring indoor dedicated condensing units to specify if the basic model is also certified as an outdoor dedicated condensing unit and, if so, the basic model number for the outdoor dedicated condensing unit.

Hussmann expressed concern regarding how doors from a walk-in system manufactured before the current standard would be replaced, suggesting that there may be challenges retrofitting compliant doors to these older systems. (Hussmann, Public Meeting Transcript, No. 23 at p. 111-112) DOE clarifies that all walk-in doors manufactured on or after June 5, 2017 must comply with applicable energy conservation standards. 10 CFR 431.306(c) – (d) DOE does not provide an exclusion for retrofit or replacement doors.

b. Manufacturers of Complete Walk-ins

In the August 2016 NOPR, DOE explained that while it does not require manufacturers of complete walk-ins to submit certification reports for the complete walk-in itself, a manufacturer of a complete walk-in must ensure that each walk-in it manufactures meets the various statutory and regulatory standards. That is, a manufacturer of a complete walk-in is required to use components that comply with the applicable standards and to ensure the final product fulfills the statutory design requirements.

For example, consider an installer deciding which panels to use. The installer could assemble a compliant walk-in in several ways. The installer could build a panel, test it, and certify it as the component manufacturer. The installer could use an uncertified panel with a claimed compliant R-value and accept responsibility for its compliance. The installer could use a certified panel with a label that meets DOE requirements and bear no responsibility for the testing and certification of the panel. In any of these situations, the installer must use compliant panels. The only difference between the three scenarios is that in the third scenario the installer is permitted to rely upon the representations of the manufacturer of a WICF component to ensure compliance of the component; if those representations turn out to be false, the component manufacturer is responsible.

As discussed in more detail in III.B.5 of this final rule, DOE proposed several labeling provisions to help manufacturers of complete walk-ins, who are not manufacturers of walk-in components, ensure compliance with the standards. In addition to the component-based regulations requiring certification (doors, panels, and

refrigeration systems), walk-ins generally must: have automatic door closers; have strip doors, spring hinged doors, or some other method of minimizing infiltration when doors are open; and for all interior lights, use light sources with an efficacy of 40 lumens per watt or more. It is the responsibility of the manufacturer of the complete walk-in to ensure that the walk-in incorporates these design features.

At the public meeting discussing the proposed test procedure, Bally remarked that it seems unlikely that an installer could use an uncertified panel with a claimed compliant R-value because component manufacturers cannot distribute panels that are uncertified. (Bally, Public Meeting Transcript, No. 23 at p. 110) DOE clarified that its proposal covers a scenario where a walk-in is built out of insulated building materials designed for applications other than walk-in coolers and freezers. In this scenario, the manufacturer of a complete walk-in is responsible for the compliance of the walk-in that it assembled and ensuring that the insulated building materials used to construct the walk-in meet the applicable R-value standards.

c. Compliance Date

Commenters raised questions regarding the compliance dates for walk-in refrigeration energy conservation standards and related refrigeration system reporting requirements.

Hussmann requested that the enforcement date for medium temperature condensing units be pushed back to align with that of the other WICF refrigeration systems. Hussmann argued that these systems often share components and this change

would allow manufacturers the flexibility to work with all equipment classes at one time. (Hussmann, No. 20 at p. 3)

DOE issued an enforcement policy on February 1, 2016, explaining that DOE will not seek civil penalties or injunctive relief concerning violations of the four energy conservation standards applicable to dedicated condensing refrigeration systems operating at medium temperatures detailed at 10 C.F.R. § 431.306(e). DOE will not seek civil penalties or injunctive relief in these cases provided that the violations relate to the distribution in commerce of WICF refrigeration system components manufactured prior to January 1, 2020.[11]

Lennox asked that DOE explicitly align the reporting requirements for medium temperature condensing units with the January 1, 2020 enforcement date (i.e., delay reporting to January 1, 2020). (Lennox, No. 13 at p. 6) DOE did not waive the certification requirements for dedicated condensing refrigeration systems operating at medium temperatures that are promulgated at 10 C.F.R. § 431.306(e). Accordingly, manufacturers must certify compliance in a manner consistent with the applicable compliance date specified in that provision. Only those models properly certified as compliant with applicable standards will be posted on DOE's CCMS public database.

[11] DOE's enforcement guidance can be found at: http://energy.gov/sites/prod/files/2016/02/f29/Enforcement%20Policy%20Statement%20-%20WICF%2002-01-16.pdf.

4. Enforcement Provisions

a. Sampling Plan for Enforcement Testing of Covered Equipment and Certain Low-Volume Covered Products

DOE proposed to include walk-ins to the list of equipment subject to the enforcement testing sampling plan for covered equipment found in Appendix B of Subpart C of Part 429. DOE received no comments on this proposal and is adopting it in this final rule.

b. Equipment-specific Enforcement Provisions

DOE proposed to add specific enforcement provisions for walk-in refrigeration systems and doors to 10 CFR 429.134. Specifically, DOE proposed to clarify which entity or entities are liable for the distribution of noncompliant units in commerce and how to verify the refrigeration capacity for walk-in refrigeration systems and surface area of walk-in doors.

If DOE determines that a basic model of a panel, door, or refrigeration system for walk-ins fails to meet an applicable energy conservation standard, then the manufacturer of that basic model is responsible for that noncompliance. If DOE determines that a complete walk-in cooler or walk-in freezer or any component thereof fails to meet an applicable energy conservation standard, then the manufacturer of that complete walk-in cooler or walk-in freezer is responsible for the noncompliance with the applicable standard. However, a manufacturer of a complete walk-in would not be held responsible for the use of components that were certified and labeled (in accordance with DOE labeling requirements) as compliant but later found to be noncompliant with the

applicable standards. DOE did not receive any comments on this aspect of its proposal and is adopting it in this final rule.

DOE also proposed adding an explanation of how DOE verifies the refrigeration capacity for walk-in refrigeration systems to 10 CFR 429.134. Specifically, DOE proposed that the refrigeration capacity of the basic model would be measured pursuant to the test requirements of 10 CFR part 431 for each unit tested. The results of the measurement(s) would be averaged and compared to the value of refrigeration capacity certified by the manufacturer. Under this approach, the certified refrigeration capacity would be considered valid only if the average measured refrigeration capacity is within 5 percent of the certified refrigeration capacity. If the certified refrigeration capacity is found to be valid, that refrigeration capacity will be used as the basis for calculating annual energy consumption for the basic model. If the certified refrigeration capacity is found to be invalid, the average measured refrigeration capacity will serve as the basis for calculating annual energy consumption for the basic model. See 81 FR at 54941.

Manitowoc commented in support of the 5 percent tolerance during enforcement testing. (Manitowoc, No. 10 at p. 2) AHRI and Lennox supported DOE's proposal to verify the net capacity, but suggested that "within" be replaced by "plus or minus" to provide a slightly wider range around the net capacity value. (AHRI, No. 11 at p. 4; Lennox, No. 13 at p. 10)

DOE agrees with Lennox and AHRI that specifying "plus or minus 5 percent" clarifies the regulatory text at 10 CFR 429.134(l)(2). In this rule, DOE will finalize its

proposal related to the certified refrigeration capacity, but will amend it to specify that the certified net capacity will be considered valid "only if the average measured net capacity is within plus or minus five percent of the certified net capacity."

Further, DOE proposed to specify how DOE would verify the surface area for walk-in display doors and non-display doors in 10 CFR 429.134. The certified surface area would be considered valid only if the average measured surface area of the door is within 1 percent of the certified surface area. If the certified surface area is found to be valid, that surface area value would be used as the basis for calculating the maximum energy consumption for the basic model. If the certified surface area is found to be invalid, the average measured surface area would serve as the basis for calculating maximum energy consumption for the basic model. See 81 FR at 54941.

Bally commented that in some walk-in applications the door cap height is reduced by 2-inches to accommodate grout and tile used for walk-in floors, resulting in a shorter walk-in door. The 1% certified surface area will mean that for a 78" door, each ¾" of an inch will require a new basic model number. Bally asked that DOE consider allowing these "shortened doors" to be measured to the nominal full door measurements, as compared to the door frame. (Bally, No. 22 at p. 2) DOE understands from the scenario Bally described that a 1% tolerance on door height is too stringent and would require door manufacturers to create additional basic models to allow for small changes in door height. DOE declines to adopt Bally's suggestion to use a nominal door height because nominal door height is undefined and may allow for too much size variation. However, DOE is adopting a tolerance of 3% in this final rule to give door manufacturers more

flexibility to establish basic models. A 3% tolerance allows a 78-inch door to be adjusted by 2 inches to accommodate features like raised flooring as specified by Bally. Accordingly, under the provision adopted here, which aligns with the provision adopted for refrigeration capacity tolerance, DOE will treat certified surface areas as valid "only if the average measured surface area is within plus or minus three percent of the certified surface area."

DOE also proposed to specify in 10 CFR 429.134 how it will account for the rated power (as defined in the proposal) of each electricity consuming device(s) in calculating the walk-in door energy consumption. For each basic model of walk-in cooler and walk-in freezer door, DOE would calculate the door's energy consumption using the power listed on the nameplate of each electricity-consuming device shipped with the door. If an electricity-consuming device shipped with a walk-in door does not have a nameplate or such nameplate does not list the device's power, then DOE would use the device's "rated power" included in the door's certification report. 81 FR at 54941. DOE did not receive any comments regarding this proposal and is adopting it in this final rule.

5. Labeling Requirements

If the Secretary has prescribed test procedures for any class of covered equipment, a labeling rule applicable to such class of covered equipment must be prescribed. See 42 U.S.C. 6315(a). EPCA, however, also sets out certain criteria that must be met prior to prescribing a given labeling rule. Specifically, to establish these requirements, DOE must determine that: (1) labeling in accordance with Section 6315 is technologically and economically feasible with respect to any particular equipment class; (2) significant

energy savings will likely result from such labeling; and (3) labeling in accordance with Section 6315 is likely to assist consumers in making purchasing decisions. (42 U.S.C. 6315(h))

If these criteria are met, EPCA specifies certain aspects of equipment labeling that DOE must consider in any rulemaking establishing labeling requirements for covered equipment. At a minimum, such labels must include the energy efficiency of the affected equipment, as tested under the prescribed DOE test procedure. The labeling provisions may also consider the addition of other requirements, including: directions for the display of the label; a requirement to display on the label additional information related to energy efficiency or energy consumption, which may include instructions for maintenance and repair of the covered equipment, as necessary, to provide adequate information to purchasers; and requirements that printed matter displayed or distributed with the equipment at the point of sale also include the information required to be placed on the label. (42 U.S.C. 6315(b) and 42 U.S.C. 6315(c))

DOE proposed labeling requirements for walk-ins – specifically, that certain information be shown on the permanent nameplates of doors, panels, and refrigeration systems. DOE also proposed to clarify requirements with respect to the disclosure of efficiency information in marketing materials and the labeling requirements for process cooling refrigeration systems. In the following sections, DOE's specific proposal and

comments received regarding its proposed nameplate requirements are discussed in detail.[12]

a. EPCA Criteria to Prescribe a Labeling Rule

DOE reviewed the labeling requirements proposed in the August 2016 NOPR with respect to the three statutory prerequisites addressing the Secretary's authority to promulgate labeling rules. (42 U.S.C. 6315(h)) The following paragraphs addresses these elements and accounts for the comments responding to this aspect of DOE's proposal.

Economically Justified and Technologically Feasible

DOE found the proposed labeling recommendations would be technologically and economically feasible with respect to walk-in cooler and freezer equipment class. In general, DOE also found that walk-in refrigeration system manufacturers and display door manufacturers already include nameplates on their equipment. Typically, these nameplates include the equipment's model number.[13] DOE explained that the inclusion of energy efficiency or energy consumption information on these labels would be technologically feasible for refrigeration system and display door manufacturers to accomplish without increasing the size of the label and that the associated costs of doing

[12] In addition, consistent with 42 U.S.C. 6315, DOE also sought written input from the Federal Trade Commission. The FTC had no comments regarding DOE's labeling proposal.
[13] Examples of walk-cooler and freezer component labels can be found in this rulemaking's docket. (See 2016-12-01 Label Examples for Walk-in Cooler and Freezer Components, No. 28, pp. 1 -10)

so would be negligible. Accordingly, in DOE's view, the proposed labeling requirement would be economically feasible as well. 81 FR at 54942.

DOE explained in the August 2016 NOPR that it was less common for non-display doors and panels for walk-ins to have nameplates, but that it was more likely that an entire assembled walk-in may have a single nameplate. Nonetheless, DOE found that adding a permanent nameplate or permanent sticker to both walk-in non-display doors and panels would be technologically feasible, as both types of equipment have adequate useable surface to apply such labels. DOE estimated that the total cost of applying labels to non-display doors and panels would be negligible—less than a tenth of one percent of the average manufacturer's annual revenue. Accordingly, based on these facts, DOE found that the proposed labeling requirements would be economically feasible. 81 FR at 54942.

Several commenters responded to these aspects of DOE's proposal.

Bally commented that the proposed requirements for panel labeling is not technologically feasible because putting the date of manufacture on each panel is difficult. Since the labels are usually printed days or weeks before the actual manufacturing date, the proposed requirement would force manufacturers to put a second label on the panel printed on the day or day after manufacture. Further, in its view, labeling is not technologically feasible because labeling each panel requires the creation of many unique nameplates for even a small walk-in. (Bally, No. 22 at p. 2) Regarding these comments, as discussed in section III.B.5.b of this final rule, DOE is no longer

requiring walk-in panel labels to include the R-value, model number, or date of manufacture. Therefore, under the approach adopted in this rule, walk-in panels will not require two labels as Bally suggested. Additionally, DOE is adopting a requirement to have a generic statement for walk-in panel labels, which eliminates the need for each panel to have a unique label.

KPS claimed the amount of information being requested for labels will increase the size of the label, and that their presence will disrupt the aesthetics of the panel because the OEM will be required to place them on each panel or door. (KPS, No. 8 at p. 1) Heat Controller also commented that, for some small equipment, the increased size of the label due to the proposed regulation may make it difficult to place the label according to UL's requirements. (Heat Controller, Public Meeting Transcript, No. 23 at p. 96)

KPS also stated that the label must be dynamic for each unique job, and the burdens faced by manufacturers come in the form of the cost of implementing the proposed changes – namely, the cost of the change, the time to implement the labeling requirement, and the materials used to make the labels. Marketing collateral changes, required system changes, and the burden to customers will, in KPS's view, result in a cost impact much greater than $10,000. (KPS, No. 8 at p. 1) Hussmann noted that the proposed labeling requirements would require it to develop a new label format, rewrite labeling software, and purchase new labeling machines that can handle the increased size of the label. (Hussmann, No. 20 at p. 2) Bally also expressed concern regarding the economic implications of the proposed requirements. It noted that describing the label as a "nameplate" implies higher costs than "label". (Bally, Public Meeting Transcript, No.

23 at p. 87) American Panel commented that it is not economically feasible to label each panel because label(s) would have to be high-grade Mylar/polyester in order to withstand being power washed and cleaned with harsh chemicals. The added cost to track and uniquely label each panel would bring no more benefit than having a single label for an entire walk-in. (American Panel, No. 7 at p. 1)

With respect to the labeling requirements generally, DOE notes that the requirements adopted in this rule will align with some of the labeling information already required by UL (e.g., brand name, model number, and date of manufacture). To this end, DOE believes that this alignment will make it less likely that manufacturers will need to increase the size of the labels that are already applied to walk-in panels and doors.

Regarding the remaining potential feasibility issues raised by commenters, DOE notes that the final rule reduces the amount of information required on component nameplates and the amount of information required to be disclosed in catalogs and marketing materials for walk-in panels, doors, and refrigeration systems. In light of KPS's concerns, the final rule does not require each walk-in component to have a unique label showing the applicable representative energy efficiency or energy consumption. Regarding Hussmann's comment that the proposed labeling requirements will cause manufacturers to undergo significant retooling, in DOE's view, the reduced requirements adopted in this rule for all walk-in components will likely reduce the amount of retooling – if any – that may be required by the rule. See section III.B.4.b, supra. As to Bally's and American Panel's concerns on the expenses associated with using permanent nameplate materials, DOE clarifies that it is using the term "permanent" to mean that the

label is not easily removable and will not become detached from the equipment under everyday wear and tear. As long as walk-in labels meet the aforementioned specifications, manufacturers may select appropriate labeling materials at their discretion.

DOE also notes that it considered the cost to manufacturers of updating their marketing materials to include efficiency information, brand, model number, and the disclosure statement on each page of the document that listed the walk-in component. See 81 FR at 54944 and 54945-54946 (discussing potential burden impacts on walk-in manufacturers, including small manufacturers). Marketing materials include literature, data sheets, selection software, sales training, and compliance documentation. In this final rule, DOE reduced the burden by removing the term "each page" from its requirement to disclosure of efficiency information in catalogs and marketing materials. Instead, DOE is requiring that all catalogs that list a regulated walk-in component and all materials used to market the component prominently display the same information that appears on the component's permanent nameplate and the applicable efficiency information. However, this information is not required to be on each page of such materials.

All of the changes that DOE is adopting in this final rule create less burdensome labeling requirements than those proposed in the NOPR. The labeling requirements for panels and doors are designed such that the labels can be applied across a range of basic models. Also, DOE is adopting less burdensome information display requirements for product catalogues. Reflecting the nature of these changes, DOE is estimating labeling and compliance costs on a per manufacturer basis rather than on a per model basis.

Activities associated with software selection, sales training and compliance documentation are typically a one-time expense for each manufacturer and do not scale with the number of models. Further, product literature templates are generally standardized templates shared between groups of walk-in components. Therefore, updates to these materials are more accurately scaled by manufacturer than by model. DOE estimated an investment of $50,000 per manufacturer to produce nameplates and literature that meet the labeling requirements based on conversations with manufacturers and published literature.[14]

Significant Energy Savings

DOE stated in the August 2016 NOPR that the proposed labeling requirements would likely result in significant energy savings. The related energy conservation standards are expected to save approximately 3 quadrillion British thermal units (quads). DOE explained that requiring labels that include the rated value subject to the standards will increase consumer awareness of the standards. 81 FR at 54943. As a result, requiring the labels may increase consumer demand for more efficient walk-in components, thus leading to additional savings beyond that calculated for the standards. In addition, labeling requirements would both help installers, assemblers, and contractors ensure that they are selecting equipment that the component manufacturer intended to be used as part

[14] Food and Drug Administration, http://www.fda.gov/ohrms/dockets/dockets/04n0382/04n-0382-bkg0001-Tab-05-01-vol1.pdf, page 3-13 (last accessed November 2016)

of a completed walk-in, and limit the potential compliance burden faced by these entities. For example, DOE understands from manufacturer interviews and market research that insulated metal panels may be used in other types of applications, such as communications equipment sheds[15]. Labeling requirements differentiate walk-in cooler and freezer panels from other types of insulated metal panels that are not appropriate for use in walk-ins.

In the August 2016 NOPR, DOE also explained that the proposed labeling requirements are likely to assist consumers in making purchasing decisions. By including the rated metric on the nameplate and marketing materials, manufacturers are able to demonstrate to purchasers that the equipment they are purchasing meets the DOE standard and is acceptable for use in a walk-in. Additionally, consumers have the information needed to compare the energy efficiency performance between different component models, with the assurance that the ratings were calculated according to a DOE-specified test procedure. 81 FR at 54943.

AHRI claimed that consumers will not see a label on the equipment before it is purchased, and that a label will not save energy, increase demand for more efficient walk-ins, or be used to make purchasing decisions. In addition, AHRI argued that most walk-ins are built to order and the labels will not assist customer decision making. Furthermore, it noted that customers do not want labels visible on their equipment, which is frequently displayed in a client-facing business setting. However, AHRI remarked that

[15] Examples of insulated metal panels can be found in this rulemaking's docket. (See "Examples of Insulated Panels Used in Applications Other than WICF", No. 29, pp. 1-11)

the ratings in CCMS and marketing materials may assist customers in purchasing decisions, but the tangible labels placed on equipment require additional cost without any consumer benefit. (AHRI, No. 11 at pp. 1-2) Manitowoc and Rheem agreed that ratings displayed in DOE's CCMS and in marketing materials may assist customers in purchasing decisions, but argued that labels would incur cost to manufacturers without any customer benefit. (Manitowoc, No. 10 at p. 1; Rheem, No. 18 at p. 5) Manitowoc, Rheem, Zero Zone, and KeepRite also commented that WICF units are usually built to order, not to sell in a retail setting, and therefore labels will not assist customers in their buying decisions. (Manitowoc, No. 10 at p. 1; Rheem, No. 18 at p. 4; Zero Zone, No. 15 at p. 2; KeepRite, No. 17 at p. 3)

Bally argued that because the customer purchases the panels before seeing them, the panel labels have less of an effect on purchasing decisions than marketing literature. (Bally, Public Meeting Transcript, No. 23 at p. 86; Bally, No. 22 at p. 3) Bally added that energy savings will not likely result from the proposed labeling regulation. Bally commented that while the test procedures for panels and doors include "short cuts" that assist manufacturers with testing, they can distort equipment comparisons. Specifically, regarding door labels, Bally noted that the rating does not reflect the range of actual uses seen in the field and the customers' actual energy use will not be accurately reflected by the energy consumption on the nameplate. Bally contended that this situation may confuse customers and cause them to misjudge the requirements of their equipment. Regarding panel labels, Bally noted that the R-value is not easily converted into cost savings. Bally also noted that manufacturers (especially of freezers) only certify that

their equipment meet the minimum requirements; therefore, customers would not be able to make significant judgments from the data displayed on the label. (Bally, No. 22 at p. 3)

In this rule, DOE is adopting labeling requirements that will likely result in significant energy savings by increasing consumers' awareness of the standards and helping installers, assemblers, and contractors ensure that the equipment they select is intended for walk-in applications. In addition, DOE's labeling requirements are likely to assist consumers in making purchasing decisions. As explained in section III.B.5.a and section III.B.5.c of this final rule, DOE modified its labeling requirements to specify that catalogs and marketing materials for each walk-in component must include each basic model's representative energy consumption or energy efficiency, as applicable. As AHRI, Manitowoc, Rheem, and Bally commented, including this information in marketing materials is beneficial to customers making purchasing decisions.

Regarding built-to-order equipment, DOE notes that energy conservation standards for walk-in components were established, in part, to address regulatory complications associated with the customization of walk-ins. Even if a complete walk-in is designed from a variety of components from different manufacturers, applying labels on walk-in equipment allows the installer verify that each component is appropriate for walk-in applications. In addition, including representative efficiency information in equipment catalogs and marketing materials allows entities designing walk-ins to compare the efficiency of walk-in components.

In response to Bally's comment that the test procedure for walk-in doors distorts energy consumption and is not indicative of energy use in the field, DOE notes that the specific rating conditions in the test procedure were established so that measured energy consumption is more equitable across the market. If a manufacturer believes that the test procedure is unrepresentative of a basic model's energy use, it may seek a test procedure waiver in accordance with the requirements in 10 CFR 431.401.

AHRI requested that DOE rescind the labeling proposal because the requirements of 42 U.S.C. 6315 have not been met. Specifically, AHRI commented that labeling will not assist customers in making purchasing decisions nor will labels save energy by increasing demand for more efficient walk-ins. (AHRI, No. 11 at p. 1-2) As explained in the preceding paragraphs, however, DOE concludes that this final rule meets the requirements of 42 U.S.C. 6315.

b. Information Disclosed on Permanent Nameplates

DOE proposed that the permanent nameplates of doors, panels, and refrigeration systems display certain information.

For walk-in doors, DOE proposed that the permanent nameplates of these components must be clearly marked with the rated energy consumption, brand name, model number, date of manufacture, and an application statement that states, "This door is designed and certified for use in walk-in cooler and freezer applications." Specifically, the energy consumption would need to be identified with an "EC__" immediately preceding the relevant value and the model number would need to be displayed in one of

the following forms: “Model__”, “Model number__”, or “Model No.__”. 81 FR at 54942.

With respect to panels, DOE proposed that the permanent nameplates of panels for walk-in cooler and walk-in freezers clearly display the rated R-value, brand name, model number, date of manufacture, and an application statement that states, “This panel is designed and certified for use in walk-in cooler and freezer applications.” The R-value would be identified with an “R-value__” immediately preceding the relevant value. The model number would also need to be displayed in one of the following forms: “Model__”, “Model number__”, or “Model No. __”. 81 FR at 54954.

For walk-in refrigeration systems that are not manufactured solely for process cooling applications, DOE proposed that the permanent nameplates of these components be clearly marked with the AWEF, brand name, refrigeration system model number, date of manufacture, and an application statement that states, “This refrigeration system is designed and certified for use in walk-in cooler and freezer applications.” The AWEF must be identified with “AWEF __” immediately preceding the relevant value and the model number must be displayed in one of the following forms: “Model__”, “Model number__”, or “Model No. __”. 81 FR at 54942. In addition, DOE proposed that the permanent nameplate of a refrigeration system component that can only be used as part of a process cooling refrigeration system must be marked clearly with the brand name, model number, the date of manufacture, and the statement, “This refrigeration system is designed only for use in walk-in cooler and freezer process cooling refrigeration applications.” The model number would be displayed in one of the following forms:

"Model __", "Model number__", or "Model No.__". If a refrigeration system can be used for both process cooling refrigeration and non-process cooling refrigeration applications, then the refrigeration system must be clearly marked with its applicable AWEF, brand name, model number, date of manufacture, and an application statement that says, "This refrigeration system is designed and certified for use in walk-in cooler and freezer applications." 81 FR at 54942.

Finally, for each of these proposed requirements, DOE proposed that all orientation, spacing, type sizes, typefaces, and line widths used to display this required information must be the same as or similar to the display of the other performance data contained on the component's permanent nameplate. 81 FR at 54942.

DOE received general comments as well as specific concerns on its labeling proposal. ASAP and NEEA supported the proposed labeling requirements. (ASAP and NEEA, No. 19 at pp. 3-4) The CA IOUs supported the adoption of WICF component labeling requirements that would apply to each WICF component, including labels on each individual panel and door. (CA IOUs, No. 21 at p. 3) AHRI, Manitowoc, Rheem, and Zero Zone recommended that DOE drop the proposed labeling requirements for WICF refrigeration systems because labels will not help customers make purchasing decisions. (AHRI, No. 11 at p. 2; Manitowoc, No. 10 at p. 1; Rheem, No. 18 at p. 4; Zero Zone, No. 15 at p. 2; Hussmann, No. 20 at p. 2) Similarly, KeepRite requested that the labeling requirements be removed for refrigeration equipment and panels. (KeepRite, No. 17 at p. 3) Hussmann requested that there be no additional labeling requirement and added that it already labels their equipment as required by UL. (Hussmann, No. 20 at p.

2) Rheem added that potential labeling requirements should have been brought up during the ASRAC negotiation. (Rheem, No. 18 at p. 5)

With respect to the labeling of efficiency information, AHRI suggested that DOE require efficiency information to be included only in published materials. AHRI explained that customers will use marketing materials to compare energy efficiency and ensure ratings were calculated according to the DOE-specific test procedure. (AHRI, No. 11 at p. 2) Rheem argued that online resources, including the CCMS database and manufacturer's literature, are preferable to labels since these sources of information offer consumers context, meaning and the opportunity to compare ratings – none of which are possible with the proposed physical labels. Rheem explained that because WICFs are not built to be purchased in a retail setting or for head-to-head comparison – as most WICF equipment is built to order -- labels will not assist customers in making purchasing decisions. Moreover, consumers would prefer not to have labels on equipment that is for display purposes. (Rheem, No. 18 at p. 4-5)

CrownTonka, Bally, and KeepRite expressed concern about labeling each panel individually. CrownTonka commented that most of their food customers and local health officials do not want labels on each panel. (CrownTonka, Public Meeting Transcript, No. 23 at pp. 84-85) Bally commented that requiring labels for each panel model would require manufacturers to invest in in-house labeling capabilities and may impact manufacturing process times. (Bally, Public Meeting Transcript, No. 23 at pp. 102-103) Bally also noted that panels qualifying for both freezer and cooler applications would require two separate R-value labels for each operating condition. (Bally, No. 22 at p. 3)

KeepRite commented that labeling every panel is not necessary, redundant and wasteful. KeepRite added that the labeling of every panel would not be aesthetically pleasing and could lead to sanitation issues. (KeepRite, No. 17 at p. 3) American Panel agreed that walk-in components should be labeled to demonstrate DOE compliance, but saw no value to the customer having labels on every walk-in insulated panel. American Panel added that labels are not seen until installation, and some panels are hidden by floor covering. (American Panel, No. 7 at p. 1) However, the CA IOUs supported requiring labels on each individual panel and door, noting that this is common practice for many construction materials (wall insulation, windows). (CA IOUs, No. 21 at p. 3)

Stakeholders also recommended alternative approaches to reduce the labeling burden. Manitowoc and KeepRite suggested that, if DOE retains the labeling requirements, then DOE should allow manufacturers to have a single label on each walk-in. (Manitowoc, No. 10 at p. 1; KeepRite, No. 17 at p. 3) KeepRite explained that a majority of panels arrive to the jobsite on the same truckload. (KeepRite, No. 17 at p. 3) CrownTonka noted that it usually provides all floor, wall, and ceiling panels for a given walk-in; IB noted that, in addition to all panels, it also usually provides passage doors. Therefore, both manufacturers suggested a labeling system where all of the components they provide for an initial installation could be covered under a single label, and only replacement panels ordered later on would be individually labeled. (CrownTonka, Public Meeting Transcript, No. 23 at pp. 97-99; IB, Public Meeting Transcript, No. 23 at pp. 99-100) Hussmann commented that since walk-ins are assembled in the field, labeling each door or panel would be excessive and it preferred using a single label for the whole WICF. In addition, Hussmann criticized the proposed labeling statements as being long

and likely to crowd the nameplate. It suggested as an alternative that a mark indicating compliance, similar to the UL or ENERGY STAR marks, be used instead. (Hussmann, No. 20 at p. 2)

Other stakeholders commented on the proposed language for inclusion on all walk-in equipment permanent nameplates – i.e., "This [equipment class] is designed and certified for use in walk-in cooler and freezer applications." Bally commented that while it supported the phrase concept, it preferred to include only this phrase on equipment labels. Bally explained that they could easily include the phrase on a UL sticker, but information like R-value, model number, or date of manufacturer would require custom label machinery. (Bally, Bally, Public Meeting Transcript, No. 23 at p. 102) Bally and CrownTonka supported using a set of three generalized labels which could applied to a range of panel models. (Bally, Public Meeting Transcript, No. 23 at pp. 105, 101-102; CrownTonka, Public Meeting Transcript, No. 23 at p. 106) CrownTonka commented that it generally builds and sells panels with a specific design, i.e. cooler or freezer, in mind. (CrownTonka, Public Meeting Transcript, No. 23 at p. 105) To this end, it suggested using one of the following phrases to indicate the intended purpose of WICF doors: "Walk in (Cooler/Freezer) Door Assembly" or "Certified Walk in (Cooler/Freezer) Door." (Bally, No. 22 at pp. 3-4) Similarly, Rheem and NCC suggested that, given the differences in freezer and cooler standards, the label's text stating the intended use of the panel should read, "This refrigeration system is designed and certified for use in walk-in cooler or freezer applications." (Rheem, Public Meeting Transcript, No. 23 at p. 92; NCC, Public Meeting Transcript, No. 23 at p. 91) Lennox recommended changing the required wording on the nameplate to read, "This refrigeration system is designed and

certified to DOE requirements for use in walk-in cooler and freezer applications." (Lennox, No. 13 at p. 9)

DOE agrees with the suggestion from Bally, CrownTonka, Rheem, and NCC. Walk-in components may be designed for walk-in cooler applications, walk-in freezer applications, or both walk-in cooler and freezer applications. Therefore, DOE finds that the approach suggested by these manufacturers improves the application statement because it not only identifies that the component is designed for use in a walk-in, but also identifies the type of walk-in (cooler, freezer, or both) for which the component is designed. This additional information would help installers verify that they are using the appropriate component for a particular application. Therefore, DOE is modifying its proposed permanent nameplate requirement by requiring that the permanent nameplate indicate whether the basic model is designed and certified for use in (1) walk-in cooler applications, (2) walk-in freezer applications, or (3) both walk-in cooler and walk-in freezer applications. For example, a walk-in panel designed and certified for use only in a walk-in cooler must contain on its a label the following statement, “This panel is designed and certified for use in walk-in cooler applications.” Similarly, if a walk-in panel is designed and certified for both walk-in cooler and walk-in freezer applications, then it must contain on its label the following statement, “This panel is designed and certified for use in walk-in cooler and freezer applications.” Although the “certified” language on the label pertains specifically to the certification of compliance to DOE, to minimize the labeling burden, DOE is adopting Lennox’s suggestion of dropping the proposed inclusion of the language “to DOE requirements” to the label.

Regarding the proposed labeling requirements, DOE's intention is to adopt a limited set of labeling requirements for walk-in components that would reduce the overall burden on manufacturers, including for installers who will be relying on these labels when assembling a given walk-in. For walk-in doors, DOE is requiring that they include a permanent nameplate marked with the door brand name and, as applicable, the statement, "This door is designed and certified for use in [walk-in cooler, walk-in freezer, or walk-in cooler and freezer] applications."

Similarly, to reduce the burden on walk-in panel manufacturers while preserving information useful for walk-in installers, DOE is requiring these components to have a permanent nameplate that includes the brand name and, as applicable, the statement, "This panel is designed and certified for use in [walk-in cooler, walk-in freezer, or walk-in cooler and freezer] applications."

In DOE's view, the more limited labeling requirements being adopted in this rule will enable manufacturers to readily demonstrate that a given walk-in component complies with the applicable DOE energy conservation standards, while eliminating the burden of creating a different label for each basic model. These limited labeling requirements are generalized and can be applied to a range of basic models in the manner suggested by Bally and CrownTonka. Further, these limited labeling requirements reduce manufacturer burden because components designed for both walk-in cooler and freezer applications would not require two separate labels, a concern expressed by Bally.

With respect to the concept of using a single label for a completed walk-in, DOE notes that its regulatory framework for this equipment relies on the component-based statutory scheme established by Congress. As a result, applying the single, completed walk-in labeling approach suggested by Manitowoc, KeepRite, CrownTonka, IB, and Hussmann would be inconsistent with that Congressionally-enacted scheme and potentially less effective at ensuring that installers and consumers have reliable information regarding whether the walk-in components they are using comply with the applicable standards. The requirements in this final rule are intended to help manufacturers of a complete walk-in identify components that comply with the applicable standards and have been certified as such. In DOE's view, a single label for a complete walk-in would reduce the utility of the label with respect to complete walk-in manufacturers (e.g., installers) since it would offer no information regarding the performance of the walk-in's regulated components.

DOE considers energy efficiency information an important aspect of walk-in design, advertising and purchasing and is therefore maintaining the requirement to report such information in catalogs and marketing materials. This change is consistent with the approach suggested by AHRI and Rheem. Specifically, DOE is requiring walk-in door manufacturers to include each basic model's representative energy consumption in catalogs and marketing materials while walk-in panel manufacturers would include each basic model's representative R-value in their catalogs and marketing materials.

Regarding door labels, Bally requested that required door labels should include units of measure that follow the maximum energy consumption metric, "kWh/day".

(Bally, No. 22 at p. 3) DOE agrees with Bally that energy consumption information should be listed with the appropriate units of measure. As explained in the previous paragraphs, DOE is not requiring walk-in doors to have energy consumption marked on their nameplates. However, manufacturers must include the representative energy consumption for each basic model of walk-in door in equipment catalogs and marketing materials. Per Bally's suggestion, DOE is adding a requirement that door energy consumption must be listed with the units of measure, "kWh/day".

Lennox, NCC, Heat Controller, CrownTonka, and Bally also commented that some of the information that the proposal would require on a label is already included in current markings or is otherwise tracked by manufacturers. AHRI, Rheem, and Hussmann commented that current safety standards require WICF manufacturers to provide the brand name, date of manufacture, and model number via a label, and that this information will allow consumers to look up efficiency information online, which Hussmann asserts is the preferred method to review information because it provides context, meaning and the opportunity to compare ratings. (AHRI, No. 11 at p. 2; Rheem, No. 18 at p. 5; Hussmann, No. 20 at p.2) Bally stated that UL labels already placed on each door include power consumption and the energy consumption labeling proposed would be redundant and confusing. (Bally, No. 22 at p. 3)

Similar to walk-in doors and panels, DOE's intention is to adopt labeling requirements for walk-in refrigeration systems that are not overly burdensome to manufacturers and that provide installers with enough information to assemble walk-ins with compliant components. In addition, based on the comments from AHRI, Rheem, and

Hussmann, DOE understands that walk-in customers benefit from having brand name, date of manufacture and model number information included on refrigeration system labels because this information allows walk-in customers to look up efficiency information in CCMS or in manufacturer literature. In light of the comments received from Lennox, NCC, Heat Controller, CrownTonka, AHRI, Rheem, and Hussmann, DOE finds that refrigeration systems are already labeled with the brand, date of manufacture, and model number information, all of which supports the view that it is technologically feasible for refrigeration systems to be labeled with this information. Further, manufacturers will have minimal financial impacts because they do not need to modify equipment nameplates in order to meet a requirement to label walk-in refrigeration systems with brand name, date of manufacturer, and model number. This rule requires walk-in cooler and freezer refrigeration systems (that are not manufactured solely for process cooling applications) to have a permanent nameplate marked with the refrigeration system's brand name, model number, date of manufacture, and the statement, "This refrigeration system is designed and certified for use in [walk-in cooler, walk-in freezer, or walk-in cooler and freezer] applications." In addition, DOE is requiring a refrigeration system that is not designated for outdoor use be labeled with the statement, "Indoor use only." See section III.A.1.d for more details. The permanent nameplate of a refrigeration system component that can only be used as part of a process cooling refrigeration system must be marked clearly with the statement, "This refrigeration system is designed for use exclusively in walk-in cooler and/or freezer process cooling refrigeration applications." DOE is requiring manufacturers of walk-in

refrigeration systems to include each basic model's representative AWEF in catalogs and marketing materials.

DOE also notes that EPCA generally requires that labels prescribed by the Secretary must indicate the energy efficiency of the affected equipment, as tested under the prescribed DOE test procedure. (42 U.S.C. 6315(b)) For walk-in equipment, the labeling requirements prescribed by the Secretary shall indicate the energy efficiency of the equipment. See 42 U.S.C. 6315(e). DOE's rule requires that manufacturers disclose whether a given regulated walk-in component meets the applicable energy efficiency requirement that applies. In DOE's view, this approach satisfies the requirements of 42 U.S.C. 6315 since it discloses whether a given component meets the prescribed level of efficiency, while minimizing the associated burden requirements. DOE notes that the specific requirements of 42 U.S.C. 6315(e) do not require that a specific value be provided on the label – only that the label "indicate the energy efficiency of the equipment." In DOE's view, this final rule's labeling requirement, which would also be coupled with a requirement that equipment catalogs prominently display the energy efficiency of regulated components, satisfies this requirement since the label will readily indicate whether a given component satisfies the prescribed energy efficiency level for that component. Accordingly, DOE's adopted approach satisfies its legal obligations while balancing the interests in providing sufficient information to the public against the potential costs of requiring a label for walk-in components. DOE notes that manufacturers are free to provide additional information regarding the performance of their components should they choose to do so, see section III.B.5.b for additional details.

Given that the disclosure statement represents that the labeled component is certified as compliant with the applicable energy conservation standard, if a manufacturer has not certified to DOE that a component meets applicable standards, the components may not contain any labels indicating compliance or certification.

DOE also received comments specific to the proposed requirement that the date of manufacture be included on the label. Lennox commented that the month and year of manufacture are already included in its UL markings, while NCC noted that its UL markings indicate the manufacturing date by quarter and year. (Lennox, Public Meeting Transcript, No. 23 at p. 83; NCC, Public Meeting Transcript, No. 23 at p. 91) NCC further explained that the exact date of manufacture cannot be determined when the nameplates are printed; instead they indicate the date of manufacture by quarter within their serial numbers, as controlled by the UL safety procedure file. NCC recommended that DOE allow manufacturers to continue using the formats defined in their safety procedure files. (NCC, No. 16 at p. 2) CrownTonka commented that they print serial numbers on each component and use these numbers to keep records of the manufactured date, intended use and other details. (CrownTonka, Public Meeting Transcript, No. 23 at pp. 92-93) Bally commented that it currently prints the manufactured date, job number, and other information on each panel. (Bally, Public Meeting Transcript, No. 23 at pp. 103-104) Lennox added that it found the proposed manufacturing date labeling requirement unclear regarding the required format for the date code, and recommended that the manufacturing date labeling requirement to be represented by the date code, which is incorporated into the unit serial number. (Lennox, No. 13 at p. 9) Heat Controller commented that the proposed requirement would duplicate information that is

already embedded in its product serial numbers, and that its marketing materials already show customers how to read this information. (Heat Controller, Public Meeting Transcript, No. 23 at pp. 96-97)

DOE clarifies that if manufacturers typically include model number information on the label of a walk-in panel, door, or refrigeration system, then that specific requirement is already satisfied for purposes of the labeling requirements being adopted in this rule, and no further action by a manufacturer would be needed. Regarding the issues raised by Lennox and Heat Controller, DOE agrees that if the date of manufacture is embedded in the serial number of a given regulated component, DOE will consider this approach to satisfy the manufacture date requirement. However, DOE emphasizes that a walk-in refrigeration system manufacturer is responsible for maintaining records to discern the date of manufacture from the serial number for each walk-in refrigeration system. DOE is specifying in its labeling requirements that if the date of manufacture is embedded in the unit's serial number, then the manufacturer of the refrigeration system must retain any relevant records to discern the date from the serial number.

DOE believes that the date of manufacture must reflect the month and year the unit was manufactured since the compliance date for the energy conservation standards for walk-in equipment is based on the date of manufacture. Labeling equipment with the date of manufacture enables DOE to readily determine whether a given unit is subject to the walk-in energy conservation standards. Quarterly dates of manufacture alone contain insufficient information to enable either DOE or the manufacturer to readily make this determination.

Heat Controller asked if a dedicated condensing unit had to be labeled with information specific to the dedicated condensing unit or information related complete refrigeration system installed in a walk-in under DOE's proposal. Heat Controller explained that they would not know where a dedicated condensing unit would end up and would not know the brand or model number under which the complete refrigeration system was sold. (Heat Controller, Public Meeting Transcript, No. 23 at p. 94) DOE clarifies that a dedicated condensing unit distributed in commerce without a matched unit cooler would only need to be labeled with information specific to the dedicated condensing unit – e.g., the model number of the dedicated condensing unit, the date the dedicated condensing unit was manufactured, etc.

In commenting on the proposed inclusion of the requirement to identify the "refrigeration system brand," Lennox viewed this proposal as referring to the original equipment manufacturer ("OEM") name and not the brands under which they market their products. It requested that "refrigeration system brand" be changed to "refrigeration manufacturer name" instead. Lennox stated that manufacturer name information is currently represented on all Lennox WICF equipment nameplates and DOE's proposal would pose no additional burden if implemented in this manner. (Lennox, No. 13 at p. 9) DOE agrees that either the manufacturer name or the brand name must be displayed on the label for walk-in components. In this rule, DOE is adopting labeling requirements for walk-in panels, doors, and refrigeration systems that require either the manufacturer name or brand name to be displayed on each unit.

CrownTonka requested that DOE clarify the term "permanent." It added that making labels permanent can require different materials, different ink, different combinations of systems, with significant costs. (CrownTonka, Public Meeting Transcript, No. 23 at pp. 97-98) DOE clarifies that it is using the term "permanent" to mean that the label is not easily removable and will not become detached from the equipment or unreadable through everyday wear and tear.

In the NOPR, DOE also considered a requirement specifying the location of the permanent nameplates on doors, panels, and refrigeration systems. The NOPR proposed to require that the permanent nameplate must be visible at all times, including when the component is assembled into a complete walk-in.

ASAP and NEEA agreed that labels should be visible because it will effectively enable utilities and code inspectors to verify the installation of qualified equipment. (ASAP and NEEA, No. 19 at pp. 3-4) The CA IOUs suggested that the labels should be placed such that they would be fully visible if the walk-in were assembled in an "open air" environment, with none hidden or covered by any joints. (CA IOUs, No. 21 at p. 3)

Other commenters, however, opposed this proposed requirement. Manitowoc and Rheem noted that WICF customers do not want visible labels on their equipment, which are often client-facing. (Manitowoc, No. 10 at p. 1; Rheem, No. 18 at p. 4) Hussmann also commented that the label should not be fully visible to the customer. Hussmann expressed concern about requiring a door label that would block view of any product, but supported using a hinge label that is visible only when the door is opened. (Hussmann,

Public Meeting Transcript, No. 23 at pp. 89-90) It added that it places labels in discreet but accessible locations because customers do not want to have visible labels on their equipment. (Hussmann, No. 20 at p. 2) American Panel suggested as an alternative that walk-in door labels be placed on the door frame with other product labeling and safety information. (American Panel, No. 7 at p. 1) Bally noted that if labels are affixed in a visible location they will allow dirt to collect around their periphery and will interfere with cleaning. (Bally, No. 22 at p. 3)

Heat Controller was concerned that the label visibility requirements could necessitate the placement of multiple labels on a single component. Specifically, it asked whether rooftop refrigeration systems would need a second label in the walk-in envelope that was visible from ground level. (Heat Controller, Public Meeting Transcript, No. 23 at p. 95) CrownTonka also asked that the visibility and permanence requirements of the label be clarified. (CrownTonka, Public Meeting Transcript, No. 23 at pp. 97-98)

American Panel commented that floor panels are often installed beneath a permanent floor covering (e.g., concrete, plastic treatments), which would render the proposed label unseen and inaccessible. (American Panel, Public Meeting Transcript, No. 23 at p. 101)

In light of these comments, DOE is electing not to require the permanent nameplate to be visible at all times, including when the component is assembled into a complete walk-in. However, the label must be visible to the entity that purchases the walk-in component. For example, a panel may have a label on an edge that is not visible

when the panel is assembled into a complete walk-in. However, the contractor that purchased the panel would be able to see the label prior to assembly. Additionally, as explained by American Panel, even if a floor panel is covered by a permanent floor covering like concrete, the floor panel must have a label that is visible prior to their integration into a fully assembled walk-in. In response to Heat Controller's comment, DOE clarifies that refrigeration systems installed on a walk-in roof would not need a second label that is visible from ground level.

Lastly, Dow commented that it understood that the NOPR did not propose to require insulation suppliers to label walk-in panels and requested that DOE clarify the role, if any, of insulation suppliers in regards to labeling. (Dow, No. 9 at pp. 2-3) DOE notes that only walk-in component manufacturers are responsible for labeling their equipment.

c. Information Disclosed on Marketing Materials

DOE proposed to clarify the requirements for the disclosure of efficiency information in marketing materials and to require that such marketing materials prominently display the same information required to appear on a walk-in component's permanent nameplate.

Lennox supported the reporting requirements to communicate the rated efficiency and net capacity in their literature for each model, but stated that reporting the information on each page of product literature is duplicative, adds no value to individuals reading the literature and creates an additional burden to manufacturers. Lennox

requested the language be revised to remove the term "each page" and indicate that reporting of this information is required in product literature. (Lennox, No. 13 at p. 10) NCC noted that while many marketing materials provide performance information at a range of operating conditions, some marketing materials, such as leaflets, may not have space available for detailed technical data. (NCC, No. 16 at p. 3)

In response to these concerns, DOE is modifying its proposal. Marketing materials must prominently display the same information that must appear on a walk-in component's permanent nameplate. In addition, DOE is requiring manufacturers to disclose the R-value of walk-in panels, the energy consumption for walk-in doors, and the AWEF for walk-in refrigeration systems in each catalog that lists the component and all materials used to market the component. However, as suggested by Lennox, DOE is removing the term "each page" from this requirement. DOE believes that reporting efficiency information on each page of catalogs and marketing materials may be overly burdensome. DOE also notes that while this rule does not require that detailed technical data, like a range of operating conditions, be reported in all marketing materials, the rule requires that all marketing materials that list the walk-in component, including leaflets, must disclose the efficiency of that component.

AHRI, Manitowoc, Rheem, NCC, and KeepRite requested that DOE clarify that net capacity need not be included in marketing materials. These stakeholders argued that net capacity is not familiar or useful to consumers and may cause them confusion. (AHRI, No. 11 at p. 3; Manitowoc, No. 10 at p. 2; Rheem, No. 18 at pp. 6-7; NCC, No. 16 at p. 3; KeepRite, No. 17 at p. 2) AHRI, Rheem, and KeepRite also asked that DOE

clarify in the final rule that only information on the proposed label is required in marketing literature. (AHRI, No. 11 at p. 3; Rheem, No. 18 at pp. 6-7; KeepRite, No. 17 at p. 2) NCC commented that manufacturers should be allowed to publish total capacity data at both rated and application conditions. (NCC, No. 16 at p. 3) AHRI and Manitowoc commented that the performance tables used in existing marketing materials are valuable to customers. (AHRI, No. 11 at p. 3; Manitowoc, No. 10 at p. 2) KeepRite asked that DOE clarify whether the current marketing methods for ratings (i.e., tables) are allowed in marketing literature. (KeepRite, No. 17 at p. 2)

This rule contains no requirement to include net capacity in marketing materials. As discussed earlier in section III.B.5.b of this final rule, DOE elected to limit its labeling requirements for panels, doors, and refrigeration systems. In addition to the limited information displayed on walk-in component labels, DOE is requiring catalogs and marketing materials for doors, panels, and refrigeration systems to include the representative energy efficiency or energy consumption for each walk-in component model listed in the literature. With respect to publishing certain application ratings, manufacturers may continue to do so. Specifically, manufacturers may publish total capacity, net capacity, system total power consumption and component power consumptions. In response to AHRI's, Manitowoc's, and KeepRite's request to retain the existing performance tables in marketing literature, DOE agrees that these tables may be retained so long as that information is consistent with this rule.

NCC also requested that DOE permit manufacturers to publish all necessary application capacities, even if some of the associated AWEF values may be below the

minimum requirement. In addition, NCC asked whether accessories that are required for certain applications but may reduce the measured AWEF values can be listed on a manufacturer's marketing material with a note stating that it "may not meet DOE minimum AWEF requirements," or similar language. (NCC, No. 16 at p. 3) Manufacturers must determine the represented AWEF for each basic model of walk-in refrigeration system in accordance with DOE's test procedure (10 CFR 431.306) and sampling requirements (10 CFR 429. 53). All walk-in refrigeration system basic models, including those basic models sold with accessories, are required to meet the applicable AWEF standards. Distribution in commerce of any covered equipment that does not comply with an applicable energy conservation standard is prohibited.

C. Compliance with Other EPCA Requirements

In addition to the issues discussed above, DOE examined its other obligations under EPCA in developing this final rule. These requirements are addressed in greater detail below.

1. Test Burden

EPCA requires that the test procedures DOE prescribes or amends be reasonably designed to produce test results that measure the energy efficiency, energy use, or estimated annual operating cost of a covered product during a representative average use cycle or period of use. These procedures must also not be unduly burdensome to conduct. See 42 U.S.C. 6314(a). DOE has concluded that the adopted amendments satisfy this requirement. The adopted test procedure amendments generally represent minor changes

to the test procedure that do not affect the equipment required for testing and either reduce or have no effect on the time required to conduct the testing.

Section III.A.2.a of this final rule discusses the reasons for removing the method for addressing the treatment of hot gas defrost – a credit – from the test procedure. That credit represented the efficiency improvement of hot gas defrost and applied to any low-temperature refrigeration system that uses hot gas defrost. The procedure adopted in this rule will require refrigeration systems with hot gas defrost to be tested by measuring their steady-state performance with their hot gas defrost components removed and pipes reconnected according to the manufacturer's specifications, as discussed in section III.A.2.a of this document. This step represents a potential increase in test burden when testing unit coolers, matched pairs, and single-package dedicated systems with hot gas defrost. The reason for this step, as discussed in section III.A.2.a of this document, is that the evaporators of such systems cannot defrost themselves and cannot remove moisture from the indoor room of the test facility without collecting frost, which necessitates testing be conducted in a facility with an indoor room conditioning system that can cool down the room and remove moisture. To the extent that a manufacturer without access to such a test facility must conduct such a test for hot gas defrost equipment, the associated test burden represents either installing such a conditioning system in the indoor room of their facility, or contracting such test work to third party laboratories.

DOE does not have detailed information regarding the test facilities that manufacturers use to test refrigeration systems, or whether all manufacturers have their own test facilities. DOE expects, however, that most of these test facilities have indoor

room conditioning systems to ensure that low-capacity systems, whose capacity may not exceed the indoor room thermal load and would therefore not be able to pull the indoor room temperature down to specified test conditions, could be tested. In support of this expectation, DOE notes that Figure C1 of appendix C of AHRI 1250-2009 shows a conditioning system in the indoor room of the illustrated test facility. DOE also expects that some manufacturers will develop performance representations for their hot gas defrost units using AEDMs, an approach that limits the need for actual testing of hot gas defrost unit coolers and matched-pairs. Therefore, DOE does not expect these increased requirements to add unduly to test burden.

Section III.A.2.b of this final rule discusses DOE's revisions to the test procedure for refrigeration systems with adaptive defrost. This final rule does not require manufacturers of refrigeration systems with adaptive defrost to measure and certify their performance using this feature. Manufacturers that make representations showing the benefit of adaptive defrost may continue using the testing and certification requirements for performance incorporating this feature since these provisions are not affected by this final rule. Hence, in DOE's view, there is no added test burden involved with the test procedure as finalized in this notice.

Section III.A.2.c of this final rule discusses DOE's revisions to the test procedure for unit coolers with on-cycle variable-speed fan control. Prior to this final rule, DOE allowed manufacturers to test the benefit of this feature using the DOE test procedure for unit coolers. DOE is modifying the test procedure to specify that certified ratings of systems with this feature shall exclude the credit. This approach lowers the testing burden

for unit coolers with this feature because manufacturers no longer need to perform this test to obtain ratings for certification. (Manufacturers may still make representations of unit cooler efficiency with this feature; in this case, the testing burden will not change.)

2. Changes in Measured Energy Use

In general, when modifying a given test procedure, DOE determines to what extent, if any, the new test procedure would alter the measured energy use of covered products. (42 U.S.C 6293(e)(1)). DOE has made this determination in light of the corresponding standards rulemaking that it is conducting in parallel with this test procedure rulemaking. See 81 FR 62980. (That rulemaking addresses potential energy conservation standards for certain classes of walk-in refrigeration systems.) DOE has determined that the adopted test procedure amendments could affect the measured energy use of certain covered products, but the amendments would only affect aspects related to testing after the compliance date of the amended energy conservation standards that DOE is proposing in a separate notice. The test procedure amendments would not, however, affect the current standards for any walk-in components, nor would they affect the refrigeration system standards promulgated in the June 2014 final rule with a compliance date of June 5, 2017 (i.e., the standards for medium-temperature, dedicated condensing refrigeration systems). Instead, the modifications in this rule will affect only low-temperature dedicated condensing refrigeration systems and unit coolers. The separate analysis for the standards rulemaking that DOE is conducting explicitly accounts for the test procedure changes finalized in this rule. Accordingly, this rule will require no further changes to the energy conservation standards beyond those which DOE has already considered in its parallel standards rulemaking analysis.

D. Additional Comments from Interested Parties

This section discusses additional comments made by interested parties during this rulemaking that were unrelated to any of DOE's specific proposals.

1. High Temperature Freezer Applications

Lennox commented that in the current market, high temperature freezer applications (10 °F to 32 °F room temperature) are served by medium temperature condensing units. (Lennox, No. 13 at p. 2) Lennox, Rheem and AHRI pointed out the challenges that using lower GWP refrigerants pose for reaching freezer testing conditions with medium temperature condensing units. Lennox, Rheem and AHRI recommended that DOE allow manufacturers to publish application ratings below 32 °F room temperature for medium temperature WICF products without having to certify this equipment as low temperature refrigeration systems using the low-temperature test conditions. (Lennox, No. 13 at pp. 2-4; Rheem, No. 18 at p. 6; AHRI, No. 11 at p. 7) Lennox suggested that this "high temperature freezer" application may justifiably represent a third class of walk-in refrigeration systems (in addition to low-temperature and medium-temperature), which could require establishing a third set of test procedure operating conditions and standards. However, Lennox also highlighted the cost and reporting burden associated with establishing a new equipment class for the high temperature freezer application. (Lennox, No. 13 at pp. 2-4) Hussmann requested that manufacturers be allowed to market and sell medium temperature unit coolers for applications with interior temperatures less than 32 °F. Although not explicitly stated in the comment, DOE assumes Hussmann intended this as a request that DOE not require the testing and certifying of such equipment as low-temperature unit coolers. Hussmann

explained that unit coolers cannot have optimized performance at both -10 °F and close-to-32 °F test conditions. (Hussmann, No. 20 at p. 3)

As noted earlier, DOE published a notice of proposed rulemaking to address potential energy conservation standards for certain classes of walk-in refrigeration equipment. In response to that rulemaking proposal, Lennox submitted additional information on the high temperature freezer issue. (See docket No. EERE-2015-BT-STD-0016, Lennox, No. 89 at pp. 2-5) In particular, Lennox provided AWEF values for operation at 10 °F room temperature showing that medium-temperature condensing units are more efficient than low-temperature condensing units at 10 °F room temperature. These values also indicated that medium-temperature condensing units were more efficient under these conditions than the low-temperature AWEF standard levels proposed by DOE (which apply for -10 °F rather than 10 °F room conditions). See 81 FR at 62982 (detailing proposed standard levels for various walk-in refrigeration equipment classes). Lennox used these data to argue that DOE's interests (i.e. ensuring that the most efficient equipment will be used in walk-ins) would best be served by allowing use of medium temperature condensing units in the 10 °F to 32 °F range without additional testing or certification, because of the medium-temperature units' better efficiency. (Docket No. EERE-2015-BT-STD-0016, Lennox, No. 89 at p. 4)

DOE discussed the issues regarding publishing application ratings in section III.B.2. DOE acknowledges the market need for equipment to serve the high-temperature freezer market and that medium-temperature units may have better efficiency than low-temperature units in this temperature range. However, models that span multiple

equipment classes are to be tested and certified as compliant with the applicable standard for each equipment class. If these equipment cannot be tested in a way that properly represents their performance characteristics, manufacturers have the option of petitioning DOE for test procedure waivers as described in 10 CFR 431.401. DOE notes the test method of commercial refrigerators, freezers, and refrigerator-freezers includes provisions for testing equipment at the lowest application product temperature. (10 CFR part 431, appendix A to subpart C) While DOE is not formalizing such an approach in this rule, the manufacturer may consider such an approach or other applicable test methods when petitioning for a waiver. DOE may also consider establishing new equipment classes and developing applicable test methods in future rulemakings.

2. Unit Cooler With Mounted/Ancillary Components

Lennox recommended that DOE update the test procedure in section 3.3.1 of 10 CFR part 431, subpart R, appendix C to indicate that any mounted or ancillary components installed in the refrigerant flow path upstream of the distributor and downstream of the heat exchanger exit are to be removed during the test. Lennox noted the 10 °F temperature differential ("TD") at the heat exchanger was specified as the basis for the test procedure[16] and also used in calculations to establish the proposed unit cooler ("UC") AWEF standards. Lennox indicated the pressure drop of the ancillary components outside of the heat exchanger was not considered when setting the UC standards. Lennox commented that the pressure drop results in loss of ability to attain the

[16] For example, for a freezer unit cooler, section 3.3.1 of 10 CFR 431, subpart R, appendix C as finalized in this notice indicates that the suction A condition of Table 16 of AHRI 1250-2009 is used for testing. For this condition, the entering air temperature is -10 °F and the saturated suction temperature is -20 °F, representing a 10 °F TD.

10 °F TD at the heat exchanger. Therefore, the ancillary components should be removed during tests. (Lennox, No. 13 at p. 5)

Regarding this issue, DOE notes that the current test conditions for testing unit coolers includes a 25 °F saturated suction temperature for medium temperature unit coolers and -20 °F for low-temperature unit coolers (see 10 CFR 431.304(12)(ii)). These conditions represent a 10 °F TD relative to the unit cooler air entering dry-bulb temperatures (see Tables 15 and 16 in 10 CFR 431.304), which is consistent with AHRI 1250-2009. DOE maintained the same test conditions in this final rule in section 3.3.1 of 10 CFR Part 431, Subpart R, Appendix C. There is no indication in AHRI 1250-2009, nor in the test procedure in 10 CFR 431.304, that these conditions apply to the heat exchanger rather than the suction outlet. For example, Table C2 of Appendix C of AHRI 1250-2009 lists "pressure of superheated refrigerant vapor leaving the Unit Cooler" as a measured quantity. DOE asserts that "leaving the unit cooler" is not the same as "within the heat exchanger." The "leaving the heat exchanger" location is underscored by Figure C1 of Appendix C of the test standard, which shows the pressure measurement in the pipe after it has exited the unit cooler. AHRI 1250-2009 does not point to locations within the heat exchanger when referencing the unit cooler exit, focusing instead on the exit piping. Hence, it is not clear that the test procedure calls for 10 °F TD within the heat exchanger if there is any appreciable pressure drop between the heat exchanger and the pipe leaving the unit cooler.

Regarding Lennox's comment that the proposed UC AWEF standards used an assumed 10 °F TD at the heat exchanger, DOE's unit cooler energy modeling in support

of its standards proposal did not involve any assumption regarding the removal of any mounted/ancillary components in the refrigerant line. The analysis also did not assume that there would be any significant pressure drop between the heat exchanger's suction header and the unit cooler outlet. As DOE noted in its standards proposal, DOE's unit cooler testing indicated that the unit coolers' measured capacities are lower than the nominal capacities reported in manufacturer literature. These results suggest that using a unit cooler's nominal capacity would overestimate both capacity and efficiency when measured during testing. (September 11, 2015 Public Meeting Presentation, Docket No. EERE-2015-BT-STD-0016, No. 3 at p. 40) Rheem suggested that this discrepancy may be due, in part, to the difference between the test conditions used during testing and those used when determining the nominal capacity of a unit cooler. (Docket No. EERE-2015-BT-STD-0016, Rheem, Public Meeting Transcript (September 11, 2015), No. 61 at pp. 116-117) DOE's standards analysis used performance modeling of WICF evaporator coils, calibrated with testing data, to develop an equation that related manufacturer-reported nominal capacity to the net capacity measured during unit cooler testing. (September 30, 2015 Public Meeting Presentation, Docket No. EERE-2015-BT-STD-0016, No. 7 at pp. 55 and 57) The tests conducted were consistent with AHRI 1250-2009, with the pressures measured in the exit piping leaving the unit coolers. DOE used this approach, which was vetted by the WICF Working Group, for determining unit cooler measured capacity in the subsequent analysis. (Docket No. EERE-2015-BT-STD-0016, various parties, Public Meeting Transcript (October 15, 2015), No. 62 at pp. 205-209)

Moreover, Lennox did not indicate in its submission which ancillary components should be removed. DOE believes any components that are necessary for the proper

operation of a given unit cooler should remain part of that equipment when tested. DOE is aware that unit coolers equipped with hot gas defrost are likely to require additional valves in the refrigerant line. DOE discusses specific requirements regarding components installed as part of hot gas defrost units in section III.A.2.a of this final rule. DOE notes that evaporator pressure regulators ("EPRs") are commonly installed with unit coolers in supermarket refrigeration systems, but not in dedicated condensing applications. For this reason, DOE believes that it may be acceptable to remove the EPR during unit cooler testing, but is not formalizing this approach in the test procedure at this time. DOE is not aware of any other ancillary components that are likely to be installed as indicated by the comment. If a manufacturer believes the inclusion of any ancillary components would make testing non-representative of average use cycles, it can petition DOE for a waiver in accordance with the requirements in 10 CFR 431.401.

3. Off-cycle Unit Cooler Variable-Speed Fan Setting

Lennox recommended that DOE specify that during the unit cooler off-cycle fan power test, the controls shall be adjusted to 50% fan speed/duty cycle only if the controls are adjustable, and that otherwise the control default parameters shall be used. (Lennox, No. 13 at p. 5)

Lennox's suggestion, if adopted, would potentially allow fans with fixed two-speed control to use speed below 50% in unit cooler testing. During one of the Working Group meetings, Rheem stated concern with air flow distribution at low fan speed. Lennox and Rheem agreed with selecting 50% as the minimum evaporator fan turn-down for both on-cycle and off-cycle evaporator fan speed in DOE's engineering analysis

supporting the standard rulemaking. (Docket No. EERE-2015-BT-STD-0016, Rheem, Lennox, Public Meeting Transcript (September 11, 2015), No. 61 at pp. 135-136) In a subsequent meeting, DOE presented analyses that used as the lowest speed for variable-speed fan operation 50% of the fan's maximum speed for both on-cycle and off-cycle in the analysis. The Working Group raised no objections to this approach. (See public meeting presentation, Docket No. EERE-2015-BT-STD-0016, No. 7 at p. 20; see also Public Meeting Transcript (September 30, 2015), Docket No. EERE-2015-BT-STD-0016, No. 67 at p. 106). Consistent with this approach, DOE used a 50% lower limit as part of its energy conservation standard rulemaking analysis. See Docket EERE-2015-BT-STD-0016, NOPR Technical Support Document, No. 70, Section 5.5.6.7 pp. 5-34 to 5-35. The energy conservation standards developed during the related negotiated rulemaking are based on the use of this 50% limit for testing. Hence, it would be inconsistent to now allow the use of a lower fan speed in tests for demonstration of compliance with the standards. Consequently, consistent with the approach laid out during the negotiated rulemaking for walk-in standards, DOE is continuing to use 50% as the lower limit of evaporator fan duty cycle and fan speed. The procedure allows two- or multi-speed fan controls to use a low (or intermediate) speed that is no less than 50% of the maximum fan speed. DOE notes that the test procedure does not prohibit a manufacturer from offering evaporator fan speed/duty cycle settings that are lower than 50% in the market, but recognizes that such fans would likely require multi-speed motors. These designs would likely use low-speed settings for the off-cycle in some installations and intermediate speed settings for the off-cycle in other installations that require these higher (intermediate) speeds to ensure more complete air mixing—but off-

cycle for testing would be 50% of full-speed or higher using an intermediate speed setting.

4. Unit Cooler Capacity Determination in Condensing Unit Only Test

Lennox and Rheem suggested that the WICF test procedure lacks clarification on the capacity calculation when testing a condensing unit only. Both commenters suggested using the condensing unit capacity in the AWEF calculation. Rheem proposed the condensing unit capacity should be calculated using the enthalpy of the refrigerant leaving the condensing unit (liquid line), the enthalpy of the refrigerant entering the condensing unit (suction line), and the measured refrigerant mass flow rate. (Lennox, No. 13 at p.11; Rheem, No. 18 at p.7)

DOE notes the saturated refrigerant temperatures at the unit cooler coil exit for the purposes of calculating the enthalpy leaving the unit cooler are provided in section 3.4.2.1 of the proposed 10 CFR 431 Subpart R, Appendix C (and also 10 CFR 431.304(12)(ii) of the current test procedure), and are 25 °F for medium temperature and -20 °F for low temperature. Section 3.4.1 indicates that the suction dew point conditions at the condensing unit are the "suction A" conditions provided in AHRI 1250-2009, Tables 11 through 14—these are 23 °F for medium temperature and -22 °F for low temperature. Hence, the pressure drop in the suction line is assumed to be equivalent to a 2 °F reduction in dew point temperature.

However, the unit cooler refrigerant exit temperature or superheat, neither of which were provided in the test procedure, is also required to calculate the unit cooler

leaving enthalpy. The test procedure requires testing with a suction temperature entering the unit cooler (i.e., return gas temperature) equal to 41 °F for medium temperature and 5 °F for low temperature (see, e.g., Tables 11 and 13 of AHRI 1250-2009). DOE notes that the exit temperature for a medium-temperature unit cooler could not be 41 °F, because the temperature of the air that the refrigerant is cooling is taken to be 35 °F. Likewise, the exit temperature for a low-temperature unit cooler could not be 5 °F, because the entering air temperature for a low-temperature unit cooler is taken to be -10 °F. By assuming that the refrigerant temperature leaving the unit cooler is 41 °F for medium temperature and 5 °F for low temperature, the approach proposed by Lennox and Rheem would take credit for refrigeration capacity that could not have been delivered by the unit cooler. DOE does not believe this is appropriate.

Instead, DOE considered the approach recommended by the WICF Working Group, which DOE applied in its walk-in standards engineering analysis. During the Working Group meetings, DOE presented the use of a 6.5 °F unit cooler exit superheat assumption for calculating unit cooler capacity of low temperature dedicated condensing unit tested alone. See Docket No. EERE-2015-BT-STD-0016, DOE and Hussmann, Public Meeting Transcript (September 30, 2015), No. 67 at pp. 135. DOE developed a spreadsheet-based engineering model that calculates the performance of different WICF equipment designs and summarizes cost versus efficiency relationships for the classes covered in the energy conservation standard rulemaking. DOE made a draft version of the spreadsheet available to the Working Group members and the general public. See Docket EERE-2015-BT-STD-0016, No. 32. DOE implemented integer superheat values in the engineering spreadsheet to avoid refrigerant property calculation errors. A caucus

of manufacturers later submitted their notes after reviewing the DOE-provided draft engineering spreadsheet. There was no disagreement on the selection of unit cooler superheat values as part of condensing unit calculations. See Docket EERE-2015-BT-STD-0016, No. 45) Consistent with the superheat values given in the engineering spreadsheet presented to the Working Group, DOE is adopting the same values (6 °F for low temperature, 10 °F to medium temperature) in this final rule for low temperature and medium temperature condensing units tested alone. DOE adds the prescribed superheat values to section 3.4.2.1 for purposes of calculating enthalpy leaving the unit cooler as part of the calculating gross capacity. DOE notes that the recommendations made by Lennox and Rheem for the conditions representing enthalpy at the unit cooler inlet are consistent with the engineering analysis as discussed by the WICF Working Group, for which unit cooler inlet enthalpy equals to condensing unit outlet enthalpy (i.e., 0 °F liquid line subcooling), (see Docket No. EERE-2015-BT-STD-0016, DOE and Rheem, Public Meeting Transcript (September 30, 2015), No. 67 at pp. 133-134; see also October 15, 2015 Public Meeting Presentation, slide 42, available in Docket No. EERE-2015-BT-STD-0016, No. 26 at p. 42), which is equivalent to the subcooling that would be present at the exit of a typical condensing unit during a test.

5. Insulation Aging

EPCA defines the R-value as the 1/K factor multiplied by the thickness of the panel, and that the K factor shall be tested based on ASTM test procedure C518-2004. (42 U.S.C. 6314(a)(9)(A)). (The K factor represents the thermal conductivity.) EPCA, however, does not specify when the R-value should be determined. As was first discussed

in the 2010 NOPR and later in the 2010 SNOPR, the R-value of polyurethane and extruded polystyrene ("XPS") insulation products can significantly decrease with time. 75 FR 185, 192-195 (January 4, 2010) and 75 FR 55067, 55075-55081 (September 9, 2010). To address this concern, two European testing standards DIN EN 13164:2009 and DIN EN 13165:2009 were included in the 2011 Test Procedure final rule in order to take foam aging into consideration when determining an R-value for these insulation types. 76 FR at 21585 (April 15, 2011). However, as discussed in its 2014 final rule addressing the use of AEDMs and certain test procedure issues with respect to walk-ins, DOE received a number of negative comments regarding this aspect of the WICF panel test procedure. See 79 FR 27388. The comments largely presented two concerns: test burden and the availability of laboratories to conduct these tests. In these comments, multiple manufacturers suggested that no independent laboratories were capable of conducting DIN EN 13164/13165 tests. Several industry comments suggested that the cost of these tests could be excessive, particularly given the limited availability of independent test laboratories to perform these specific tests. See section III.D. of the 2014 AEDM and Test Procedure SNOPR for a full comment summary, 79 FR at 9835-9837. In response to the concerns highlighted in these comments, DOE ultimately removed the portions of the test procedure referencing DIN EN 13164/13165. 79 FR at 27405.

This issue resurfaced in the comments of EPS-IA in response to the August 2016 NOPR. EPS-IA reiterated that the R-value of XPS products reduces significantly from the time of production ("fresh") to when it's assembled in panels (weeks or months later). Further, EPS-IA noted that panel manufacturers often accelerate the aging process by shaping or milling the XPS product during panel assembly. (EPS-IA, No. 12 at p. 2)

EPS-IA argued that existing regulations allow manufacturers to report, and assemblers to rely upon, the "fresh" R-value, which is significantly higher than the actual R-value of the XPS in an assembled panel. (EPS-IA, No. 12 at p. 1) EPS-IA suggested that DOE modify the regulation to require the reporting of a stable, long-term R-value, or alternatively to define “fresh” and implement controls to ensure manufacturers are incorporating "fresh" insulation into the panels. EPS-IA also suggested that DOE adopt existing FTC R-value regulations, rather than craft its own test methodology, and noted that requiring panel manufacturers to label each unit will not address the issue. (EPS-IA, No. 12 at p. 2)

DOE agrees with EPS-IA’s observation that insulation, including those types used in walk-in applications, may exhibit aging. However, in this test procedure, DOE proposed editorial changes to the test procedure for measuring R-value for walk-in cooler and freezer panels. While the test procedure does not account for insulation aging at this time, the Department may consider alternate test methods – such as those suggested by EPS-IA -- for addressing insulation aging in a future energy conservation standard and test procedure rulemakings.

6. Laboratory Qualification

DOE received written comments on the capability of test laboratories performing enforcement testing. AHRI and Manitowoc recommended that DOE ensure that laboratories demonstrate repeatability on a regular basis in order to justify the results from an enforcement test. (AHRI, No. 11 at p. 4; Manitowoc, No. 10 at p. 2) NCC noted

that DOE should pre-qualify laboratories on testing of WICF refrigeration systems where enforcement tests for this equipment would be performed. (NCC, No. 16 at p. 6)

DOE requires enforcement testing to be conducted at laboratories accredited to the International Organization for Standardization ("ISO")/International Electrotechnical Commission ("IEC"), "General requirements for the competence of testing and calibration laboratories." In addition, when conducting enforcement testing, DOE requires the specific DOE test procedure to be on the test laboratory's scope of accreditation. 10 CFR 429.110(a)(3) DOE may consider additional criteria for test laboratories conducting walk-in cooler or walk-in freezer testing in a separate rulemaking that could apply equally to both test laboratories used by manufacturers and those used by DOE for enforcement.

7. Variable-Capacity Condensing Unit Test Method

The CA IOUs recommended that DOE begin to address the issues with testing variable-capacity condensing units. (CA IOUs, No. 21 at pp. 4-5)

DOE is aware that ASHRAE Standard Project Committee 210 (SPC 210) has established a Working Group to address test methods issues regarding variable- and multiple-capacity condensing units. The SPC 210 Working Group includes members representing walk-in refrigeration system and compressor manufacturers who are familiar with the design, operation and testing of variable- and multiple-capacity compressors and condensing units. DOE believes it is appropriate to permit ASHRAE SPC 210 to continue with its developmental work in defining an appropriate test method for this

equipment. Allowing these industry experts to analyze and develop the parameters of an approach to address this equipment will help ensure that the fundamental issues associated with testing this equipment are sufficiently vetted and addressed. Once that development work has completed and a test method has been developed, DOE will examine that method and may then consider its incorporation into the applicable regulations in a future rulemaking.

8. Request for Supplemental Notice of Proposed Rulemaking

AHRI and Manitowoc recommended that DOE publish a supplemental notice of proposed rulemaking ("SNOPR") as the next stage of this rulemaking. The written comments argued that many of the NOPR proposals did not originate from the ASRAC negotiation, and that many of the proposals do not provide a clear way forward for implementation. The comments also indicated DOE has the necessary time available to issue an SNOPR. (AHRI, No 11 at p.7; Manitowoc, No 10 at p.3)

DOE has the authority to propose amendments to its regulations that are necessary in order to properly administer standards and test procedure requirements. DOE notes the ASRAC negotiations had a limited scope that did not address many topics proposed in the NOPR. The proposals not originating from the negotiations are clearly identified in the NOPR and this final rule, and DOE believes that stakeholders had ample time to voice concerns and suggest alternative approaches. DOE has received numerous comments to its NOPR and has considered these comments carefully in modifying its approach and finalizing the proposed amendments. DOE notes that AHRI and Manitowoc did not provide any detail as to which of the proposals in the NOPR would

require an SNOPR. For these reasons, DOE has finalized this rulemaking without publishing a SNOPR.

9. ASRAC Working Group Representation

KPS commented that the ASRAC Working Group had little representation from WICF OEMs. KPS also suggested adding more WICF OEMs to the Working Group. (KPS, No. 8 at p.1)

Prior to the Working Group meetings, on August 5, 2015, DOE published a notice of intent to establish a Working Group for Certain Equipment Classes of Refrigeration Systems of Walk-in Coolers and Freezers to Negotiate a Notice of Proposed Rulemaking for Energy Conservation Standards. 80 FR 46521. DOE notes that the agenda for the WICF Working Group meetings included as key issues (a) proposed energy conservation standards for six classes of refrigeration systems and (b) potential impacts on installers. 80 FR 46521, 46523 (August 5, 2015). These issues focused on refrigeration systems and installers. As discussed in section I.B, the Working Group consisted of 12 representatives of parties having a defined stake in the outcome of the proposed standards and one DOE representative. These members included six representatives of WICF refrigeration system manufacturers (Traulsen, Lennox, Hussmann, Manitowoc, Rheem, and Emerson). In addition, a representative of the Air Conditioning Contractors of America represented walk-in installers. Other members other than DOE represented efficiency advocacy groups and utilities. (Docket EERE-2015-BT-STD-0016, No. 56 at p. 4) Hence, DOE believes that the representation was appropriate for the scope of the Working Group.

10. EPCA Prescriptive Requirements

During the public meeting, AHRI asked for clarification as to whether the EPCA prescriptive requirements are still needed with the minimum energy efficiency standard DOE established. (AHRI, Public Meeting Transcript, No. 23, at p. 14)

DOE notes it is not within DOE's authority to waive the statutorily-prescribed prescriptive design requirements set forth in EPCA. (42 U.S.C. 6313(f)) EPCA does not specify an expiration date for these requirements and there is no indication in the statute that the performance-based standards would supplant the already-enacted prescriptive requirements. Hence, these prescriptive requirements continue to remain in effect.

IV. Procedural Issues and Regulatory Review

A. Review Under Executive Order 12866

The Office of Management and Budget ("OMB") has determined that test procedure rulemakings do not constitute "significant regulatory actions" under section 3(f) of Executive Order 12866, Regulatory Planning and Review, 58 FR 51735 (October 4, 1993). Accordingly, this action was not subject to review under the Executive Order by the Office of Information and Regulatory Affairs ("OIRA") in the OMB.

B. Review Under the Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 et seq.) requires that when an agency promulgates a final rule under 5 U.S.C. 553, after being required by that section or any other law to publish a general notice of proposed rulemaking, the agency shall prepare a final regulatory flexibility analysis ("FRFA"). As required by Executive Order 13272, "Proper Consideration of Small Entities in Agency Rulemaking," 67 FR 53461 (August 16, 2002), DOE published procedures and policies on February 19, 2003 to ensure that the potential impacts of its rules on small entities are properly considered during the DOE rulemaking process. 68 FR 7990. DOE has made its procedures and policies available on the Office of the General Counsel's website: http://energy.gov/gc/office-general-counsel. DOE has prepared the following FRFA for the equipment that are the subject of this rulemaking.

For manufacturers of walk-in equipment, the Small Business Administration ("SBA") has set a size threshold, which defines those entities classified as "small businesses" for the purposes of the statute. DOE used the SBA's small business size standards to determine whether any small entities would be subject to the requirements of the rule. 65 FR 30848 (May 15, 2000), as amended at 65 FR 53533, 53544 (September 5, 2000) and codified at 13 CFR part 121. The size standards are listed by North American Industry Classification System ("NAICS") code and industry description and are available at www.sba.gov/contracting/getting-started-contractor/make-sure-you-meet-sba-size-standards. Walk-in equipment is classified under NAICS 333415, "Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing." The SBA sets a threshold of 1,250 employees

or less for an entity to be considered as a small business for this category. Based on this threshold, DOE presents the following FRFA analysis:

1. Need for, and objectives of, the rule

Title III, Part C of the Energy Policy and Conservation Act of 1975 ("EPCA" or, in context, "the Act"), Public Law 94-163, as amended (codified at 42 U.S.C. 6311-6317) established the Energy Conservation Program for Certain Industrial Equipment, a program covering certain industrial equipment, including walk-ins, the subject of this document. (42 U.S.C. 6311(1)(G))

In general, this program addresses the energy efficiency of certain types of commercial and industrial equipment. Relevant provisions of the Act specifically include definitions (42 U.S.C. 6311), energy conservation standards (42 U.S.C. 6313), test procedures (42 U.S.C. 6314), labeling provisions (42 U.S.C. 6315), and the authority to require information and reports from manufacturers (42 U.S.C. 6316 and 6296). Manufacturers of covered equipment must use the prescribed DOE test procedure as the basis for making representations to the public regarding the energy use or efficiency of such equipment. (42 U.S.C. 6314(d))

2. Significant issues raised in response to the IRFA

DOE did not receive written comments that specifically addressed impacts on small businesses or that were provided in response to the IRFA.

3. Description and estimated number of small businesses regulated

DOE used available public information to identify potential small manufacturers. DOE's research involved industry trade association membership directories (including those from AHRI[17] and NAFEM[18]), public databases (e.g., the SBA Database[19]), individual company Web sites, and market research tools (e.g., Dun and Bradstreet reports[20] and Hoovers reports[21]) to create a list of companies that manufacture or sell equipment covered by this rulemaking. During the 2014 rulemaking, DOE also asked stakeholders and industry representatives if they were aware of any other small manufacturers during manufacturer interviews and at DOE public meetings. DOE reviewed publicly available data and contacted select companies on its list, as necessary, to determine whether they met the SBA's definition of a small business manufacturer of covered walk-in coolers and walk-in freezers. DOE screened out companies that do not offer equipment covered by this rulemaking, do not meet the definition of a "small business," or are foreign-owned.

DOE identified forty-seven panel manufacturers, of which forty-two are the small businesses.

DOE identified forty-nine walk-in door manufacturers. Forty-five of those produce solid doors and four produce display doors. Of the forty-five solid door manufacturers, forty-two produce panels as their primary business and are considered in

[17] See www.ahridirectory.org/ahriDirectory/pages/home.aspx.
[18] See www.nafem.org/find-members/MemberDirectory.aspx.
[19] See http://dsbs.sba.gov/dsbs/search/dsp_dsbs.cfm.
[20] See www.dnb.com/.
[21] See www.hoovers.com/.

the category of panel manufacturers in this preamble. The remaining three solid door manufacturers are all considered small businesses. Of the four display door manufacturers, two are considered small businesses. Therefore, of the seven manufacturers that exclusively produce walk-in doors (three producing solid doors and four producing display doors), DOE determined that five are small businesses.

DOE identified ten walk-in refrigeration system manufacturers that produce equipment for one or more of the equipment classes analyzed in this proposal. All ten are domestic companies and three of the ten manufacturers are small businesses.

Lastly, DOE looked at manufacturers that assemble the complete walk-in cooler or walk-in freezer (e.g., an installer). Walk-in installation work is a subset of the highly fragmented heating, ventilation, air-conditioning, and refrigeration ("HVACR") industry. DOE was unable to identify any company that exclusively operated as an assembler of WICFs. In general, WICF assemblers offer walk-in installation as part of a broader refrigeration offering and/or broader heating and cooling offering.

DOE estimates that 3,400 to 14,100 companies offer walk-in contractor services. This is a subset of the roughly 87,000 plumbing, heating, and air-conditioning contractor establishments in the United Stated.[22] Key activities for these companies include the installation of residential HVAC, commercial HVAC, commercial refrigeration, and

[22] U.S. Census Bureau. Industry Snapshot thedataweb.rm.census.gov/TheDataWeb_HotReport2/econsnapshot/2012/snapshot.hrml?NAICS=238220. (Last accessed July 2016)

industrial refrigeration systems. Of these, DOE estimates the majority are small businesses.

4. Description and Estimate of Compliance Requirements

Panel manufacturers have had to comply with standards for their panels' R-value (a measure of the insulating value) since 2009. In a previous test procedure rule, published in May 2014, DOE established a sampling plan and certification reporting requirements for walk-in panels. 79 FR 27388 (May 13, 2014). DOE is not establishing any new testing, certification, compliance, or reporting requirements for panels in this final rule. However, DOE is adopting labeling requirements for walk-in panels, and DOE is establishing that manufacturers include rating information on marketing materials for panels. For further discussion of the labeling requirements, see section III.B.5. As discussed in that section, the cost of updating marketing materials could be up to $50,000 per manufacturer. DOE calculated that the cost of updating marketing materials for a small manufacturer would be less than one percent of annual revenues; thus, this requirement would not have a significant impact on small manufacturers.

This final rule establishes new certification requirements for door manufacturers and refrigeration system manufacturers to use when certifying their basic models to DOE. Door manufacturers must certify that they meet the June 2014 standards, which have a compliance date of June 5, 2017. Manufacturers of refrigeration systems for which standards were promulgated in the June 2014 final rule, and which were not subsequently remanded by the United States Court of Appeals for the Fifth Circuit's court order, must also certify that those refrigeration systems meet the June 2014 standards, which have a

compliance date of June 5, 2017. DOE is conducting a separate energy conservation standards rulemaking for those refrigeration system classes whose standards were remanded. On the compliance date for those standards, manufacturers will have to certify that those refrigeration systems meet the relevant standards using the certification requirements in this rule.

In general, DOE modified the data elements walk-in door manufacturers and walk-in refrigeration system manufacturers will be required to submit as part of a certification report indicating that all basic models distributed in commerce in the U.S. comply with the applicable standards using DOE's test procedures. These data elements include product-specific certification data describing the efficiency and characteristics of the basic model. The certification reports are submitted for each basic model, either when the requirements go into effect (for models already in distribution), or prior to when the manufacturer begins distribution of a particular basic model, and annually thereafter. Reports must be updated when a new model is introduced or a change affecting energy efficiency or use is made to an existing model resulting in a change in the certified rating. (10 CFR 429.12(a))

DOE currently requires manufacturers or their party representatives to prepare and submit certification reports using DOE's electronic Web-based tool, the Compliance Certification Management System (“CCMS”), which is the only mechanism for submitting certification reports to DOE. CCMS currently has product-specific templates that manufacturers must use when submitting certification data to DOE. See www.regulations.doe.gov/ccms/templates. This final rule does not change the

requirement that manufacturers submit certification reports electronically. DOE believes the availability of electronic filing through the CCMS system reduces reporting burdens, streamlines the process, and provides the Department with needed information in a standardized, more accessible form. This electronic filing system also ensures that submitted reports are recorded in a permanent, systematic way.

DOE is also requiring manufacturers to label their doors with the door brand name and an application statement. DOE is requiring manufacturers to label their refrigeration systems with the brand, model number, date of manufacture, an application statement and if applicable specify if the systems is for indoor use only. For further discussion of the labeling requirements, see section III.B.5. As discussed in that section, the cost of updating marketing materials could be up to $50,000 per manufacturer.

DOE added clarifications that the entity responsible for testing, rating, and certifying is the WICF component manufacturer. Thus, WICF manufacturers that exclusively assemble the complete WICF and who use components that are certified and labelled as compliant with applicable standards, do not bear any testing and certification burdens. DOE is also establishing labeling requirements and revising the certification requirements on WICF component manufacturers in this final rule. These requirements will reduce any burden on WICF manufacturers that manufacture or assemble the complete walk-in cooler or walk-in freezer by allowing them to more easily identify compliant WICF components for assembly. This does not change the compliance requirements for these WICF manufacturers and installers; however, DOE believes labeling will help WICF assemblers comply with the regulations. In conclusion, DOE

does not believe that small WICF manufacturers that assemble complete WICFs will see an increased burden from this rulemaking.

5. Significant Alternatives to the Rule

This section considers alternatives to the final rule. DOE has tried to minimize the reporting burden as much as possible by: (1) accepting electronic submissions; (2) providing preformatted templates that lay out the certification and compliance requirements for each product; and (3) allowing manufacturers to group individual models into basic models for the purposes of certification to reduce the number of discrete models reported to the Department. DOE has also made efforts to address the concerns of small businesses by expanding the ability of manufacturers to use alternative efficiency determination methods ("AEDMs") in lieu of conducting tests requiring testing equipment.

C. Review Under the Paperwork Reduction Act of 1995

1. Description of the Requirements

In this rule, DOE is expanding the information that manufacturers and importers of covered walk-in equipment would need to submit to the Department to certify that the equipment they are distributing in commerce in the U.S. complies with the applicable energy conservation standards. Further, this rule requires manufacturers to disclose performance information as part of the proposed labeling requirements for walk-in panels, doors, and refrigeration systems.

2. Information Collection Request Title

Certification Reports, Compliance Statements, Application for a Test Procedure Waiver, Recordkeeping for Consumer Products and Commercial/Industrial Equipment Subject to Energy or Water Conservation Standards, and Label and Marketing Material Information Disclosure.

3. Type of Request

Revision and Expansion of an Existing Collection.

4. Purpose

Manufacturers of the covered equipment addressed in this rule are already required to certify to DOE that their equipment complies with applicable energy conservation standards. In certifying compliance, manufacturers must test their equipment according to the applicable DOE test procedures for the given equipment type, including any amendments adopted for those test procedures, or use AEDMs (as applicable) to develop the certified ratings of the basic models. The collection-of-information requirement for the certification proposals is subject to review and approval by OMB under the PRA.

Manufacturers are required to certify: (1) new basic models before distribution in commerce; (2) existing basic models, whose certified ratings remain valid, annually; (3) existing basic models, whose designs have been altered resulting in a change in rating that is more consumptive or less efficient, at the time the design change is made; and (4) previously certified basic models that have been discontinued, annually. Respondents

may submit reports to the Department at any time during the year using DOE's online system.

Amendments to the existing walk-in standards are expected to result in slight changes to the information that DOE is collecting for walk-ins. Specifically, DOE is requiring that, in addition to information currently required for certification reports, door manufacturers report the door energy use as determined by the DOE test procedure, the rated power of each light, heater wire and/or other electricity consuming device and whether such device(s) has a control system. Refrigeration system manufacturers will need to report the Annual Walk-in Efficiency Factor ("AWEF"), net capacity as determined by the DOE test procedure, the configuration test for certification, and whether indoor dedicated condensing units are also certified as outdoor dedicated condensing units. Manufacturers will have to re-submit certification reports for basic models that they distribute in commerce starting on the compliance date of the amended standards.

In addition, DOE is requiring manufacturers of walk-in components to disclose their rated energy use or efficiency, in all component catalogs and marketing materials. For further discussion of the information disclosure requirements, see section III.B.5. As discussed in that section, the cost of initially updating marketing materials could be up to $50,000 per manufacturer.

Regarding the additional certification requirements, DOE estimates that the slight change in certification requirements would not result in additional burden because walk-

in component manufacturers are already required to annually certify compliance with the existing standards.

DOE estimates the burden for this rule as follows:

(1) Annual Estimated Number of Respondents: 63 (47 panel manufacturers, 7 door manufacturers, and 10 refrigeration system manufacturers)

(2) Annual Estimated Number of Total Responses: 1,216 (188 for panels, 28 door, 1000 for refrigeration systems)

(3) Annual Estimated Number of Burden Hours: 1,216 (1 hour for applying and creating label and updating marketing materials)

(4) Annual Estimated Reporting and Recordkeeping Cost Burden: $91,200

D. Review Under the National Environmental Policy Act of 1969

In this final rule, DOE amends its test procedure for walk-in coolers and walk-in freezers. DOE has determined that this rule falls into a class of actions that are categorically excluded from review under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) and DOE's implementing regulations at 10 CFR part 1021. Specifically, this rule amends an existing rule without affecting the amount, quality or distribution of energy usage, and, therefore, will not result in any environmental impacts. Thus, this rulemaking is covered by Categorical Exclusion A5 under 10 CFR part 1021,

subpart D, which applies to any rulemaking that interprets or amends an existing rule without changing the environmental effect of that rule. Accordingly, neither an environmental assessment nor an environmental impact statement is required.

E. Review Under Executive Order 13132

Executive Order 13132, "Federalism," 64 FR 43255 (August 4, 1999), imposes certain requirements on agencies formulating and implementing policies or regulations that preempt State law or that have Federalism implications. The Executive Order requires agencies to examine the constitutional and statutory authority supporting any action that would limit the policymaking discretion of the States and to carefully assess the necessity for such actions. The Executive Order also requires agencies to have an accountable process to ensure meaningful and timely input by State and local officials in the development of regulatory policies that have Federalism implications. On March 14, 2000, DOE published a statement of policy describing the intergovernmental consultation process it will follow in the development of such regulations. 65 FR 13735. DOE examined this final rule and determined that it will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. EPCA governs and prescribes Federal preemption of State regulations as to energy conservation for the products that are the subject of this final rule. States can petition DOE for exemption from such preemption to the extent, and based on criteria, set forth in EPCA. (42 U.S.C. 6297(d)) No further action is required by Executive Order 13132.

F. Review Under Executive Order 12988

Regarding the review of existing regulations and the promulgation of new regulations, section 3(a) of Executive Order 12988, "Civil Justice Reform," 61 FR 4729 (February 7, 1996), imposes on Federal agencies the general duty to adhere to the following requirements: (1) eliminate drafting errors and ambiguity; (2) write regulations to minimize litigation; (3) provide a clear legal standard for affected conduct rather than a general standard; and (4) promote simplification and burden reduction. Section 3(b) of Executive Order 12988 specifically requires that Executive agencies make every reasonable effort to ensure that the regulation (1) clearly specifies the preemptive effect, if any; (2) clearly specifies any effect on existing Federal law or regulation; (3) provides a clear legal standard for affected conduct while promoting simplification and burden reduction; (4) specifies the retroactive effect, if any; (5) adequately defines key terms; and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3(c) of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in sections 3(a) and 3(b) to determine whether they are met or it is unreasonable to meet one or more of them. DOE has completed the required review and determined that, to the extent permitted by law, this final rule meets the relevant standards of Executive Order 12988.

G. Review Under the Unfunded Mandates Reform Act of 1995

Title II of the Unfunded Mandates Reform Act of 1995 ("UMRA") requires each Federal agency to assess the effects of Federal regulatory actions on State, local, and Tribal governments and the private sector. Pub. L. No.104-4, sec. 201 (codified at 2

U.S.C. 1531). For a regulatory action resulting in a rule that may cause the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector of $100 million or more in any one year (adjusted annually for inflation), section 202 of UMRA requires a Federal agency to publish a written statement that estimates the resulting costs, benefits, and other effects on the national economy. (2 U.S.C. 1532(a), (b)) The UMRA also requires a Federal agency to develop an effective process to permit timely input by elected officers of State, local, and Tribal governments on a proposed "significant intergovernmental mandate," and requires an agency plan for giving notice and an opportunity for timely input to potentially affected small governments before establishing any requirements that might significantly or uniquely affect small governments. On March 18, 1997, DOE published a statement of policy on its process for intergovernmental consultation under UMRA. 62 FR 12820; also available at http://energy.gov/gc/office-general-counsel. DOE examined this final rule according to UMRA and its statement of policy and determined that the rule contains neither an intergovernmental mandate, nor a mandate that may result in the expenditure of $100 million or more in any year, so these requirements do not apply.

H. Review Under the Treasury and General Government Appropriations Act, 1999

Section 654 of the Treasury and General Government Appropriations Act, 1999 (Pub. L. 105-277) requires Federal agencies to issue a Family Policymaking Assessment for any rule that may affect family well-being. This final rule will not have any impact on the autonomy or integrity of the family as an institution. Accordingly, DOE has concluded that it is not necessary to prepare a Family Policymaking Assessment.

I. Review Under Executive Order 12630

DOE has determined, under Executive Order 12630, "Governmental Actions and Interference with Constitutionally Protected Property Rights" 53 FR 8859 (March 18, 1988), that this regulation will not result in any takings that might require compensation under the Fifth Amendment to the U.S. Constitution.

J. Review Under Treasury and General Government Appropriations Act, 2001

Section 515 of the Treasury and General Government Appropriations Act, 2001 (44 U.S.C. 3516 note) provides for agencies to review most disseminations of information to the public under guidelines established by each agency pursuant to general guidelines issued by OMB. OMB's guidelines were published at 67 FR 8452 (February 22, 2002), and DOE's guidelines were published at 67 FR 62446 (October 7, 2002). DOE has reviewed this final rule under the OMB and DOE guidelines and has concluded that it is consistent with applicable policies in those guidelines.

K. Review Under Executive Order 13211

Executive Order 13211, "Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use," 66 FR 28355 (May 22, 2001), requires Federal agencies to prepare and submit to OMB, a Statement of Energy Effects for any significant energy action. A "significant energy action" is defined as any action by an agency that promulgated or is expected to lead to promulgation of a final rule, and that (1) is a significant regulatory action under Executive Order 12866, or any successor order; and (2) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (3) is designated by the Administrator of OIRA as a significant energy

action. For any significant energy action, the agency must give a detailed statement of any adverse effects on energy supply, distribution, or use if the regulation is implemented, and of reasonable alternatives to the action and their expected benefits on energy supply, distribution, and use.

This regulatory action is not a significant regulatory action under Executive Order 12866. Moreover, it would not have a significant adverse effect on the supply, distribution, or use of energy, nor has it been designated as a significant energy action by the Administrator of OIRA. Therefore, it is not a significant energy action, and, accordingly, DOE has not prepared a Statement of Energy Effects.

L. Review Under Section 32 of the Federal Energy Administration Act of 1974

Under section 301 of the Department of Energy Organization Act (Pub. L. 95–91; 42 U.S.C. 7101), DOE must comply with section 32 of the Federal Energy Administration Act of 1974, as amended by the Federal Energy Administration Authorization Act of 1977. (15 U.S.C. 788; FEAA) Section 32 essentially provides in relevant part that, where a proposed rule authorizes or requires use of commercial standards, the notice of proposed rulemaking must inform the public of the use and background of such standards. In addition, section 32(c) requires DOE to consult with the Attorney General and the Chairman of the Federal Trade Commission ("FTC") concerning the impact of the commercial or industry standards on competition.

The modifications to the test procedure for walk-in coolers and walk-in freezers adopted in this final rule incorporates testing methods contained in certain sections of the

following commercial standards: ASTM C518-14, “Standard Test Method for Thermal Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus”; AHRI Standard 1250-2009 “Standard for Performance Rating of Walk-ins”; AHRI 420-2008, "Performance Rating of Forced-Circulation Free Delivery Unit Coolers for Refrigeration"; and ASHRAE 23.1-2010, "Methods of Testing for Performance Rating Positive Displacement Refrigerant Compressors and Condensing Units that Operate at Subcritical Temperatures of the Refrigerant". DOE has evaluated these standards and was unable to conclude whether they fully comply with the requirements of section 32(b) of the FEAA (i.e., whether they were developed in a manner that fully provides for public participation, comment, and review.) DOE has consulted with both the Attorney General and the Chairman of the FTC about the impact on competition of using the methods contained in these standards and has received no comments objecting to their use.

M. Congressional Notification

As required by 5 U.S.C. 801, DOE will report to Congress on the promulgation of this rule before its effective date. The report will state that it has been determined that the rule is not a "major rule" as defined by 5 U.S.C. 804(2).

N. Description of Materials Incorporated by Reference

In this final rule, DOE incorporates by reference the ASTM C518–04 test method titled “Standard Test Method for Thermal Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.” This reference standard is the method by

which thermal conductivity (the “K factor”) of a walk-in panel is measured and its use is mandated by EPCA. (42 U.S.C. 6314(a)(9)(A))

Copies of ASTM C518-04 may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, by phone at (610) 832-9500, or by going to www.astm.org.

Also, DOE incorporates by reference the test standard published by AHRI, titled “Standard for Performance Rating of Walk-ins,” AHRI Standard 1250-2009. AHRI Standard 1250-2009 establishes definitions, test requirements, rating requirements, minimum data requirements for published ratings, operating requirements, marking and nameplate data, and conformance conditions for walk-in coolers and walk-in freezers. This testing standard applies to mechanical refrigeration equipment that consists of an integrated, single-package refrigeration unit, or as separate unit cooler and condensing unit components, where the condensing unit can be located either indoors or outdoors. Controls can be integral or can be added by a separate party, as long as their performance is tested and certified with the listed mechanical equipment.

Copies of AHRI Standard 1250-2009 may be purchased from AHRI at 2111 Wilson Boulevard, Suite 500, Arlington, VA 22201, or by going to www.ahrinet.org.

DOE also incorporates by reference AHRI 420-2008, titled "Performance Rating of Forced-Circulation Free Delivery Unit Coolers for Refrigeration." AHRI 420-2008 establishes the following elements for forced-circulation free-delivery unit coolers for

refrigeration: definitions, test requirements, rating requirements, minimum data requirements for published ratings, marketing and nameplate data, and conformance conditions. The standard applies to factory-made, forced-circulation, free-delivery unit coolers, as defined in Section 3 of this standard, operating with a volatile refrigerant fed by either direct expansion or liquid overfeed at wet conditions, dry conditions, or both.

Copies of AHRI 420-2008 may be purchased from AHRI at 2111 Wilson Boulevard, Suite 500, Arlington, VA 22201, or by going to www.ahrinet.org.

Finally, DOE also incorporates by reference ASHRAE Standard 23.1-2010, entitled "Methods of Testing for Performance Rating Positive Displacement Refrigerant Compressors and Condensing Units that Operate at Subcritical Temperatures of the Refrigerant." ASHRAE 23.1-2010 provides testing methods for rating the thermodynamic performance of positive displacement refrigerant compressors and condensing units that operate at subcritical temperatures of the refrigerant. This standard applies to all of the refrigerants listed in ASHRAE Standard 34, "Designation and Safety Classification of Refrigerants," that fall within the scope of positive displacement refrigerant compressors and condensing units that operate at subcritical temperatures of the refrigerant, which either (a) do not have liquid injection or (b) incorporate liquid injection that is achieved by compressor motor power.

Copies of ASHRAE 23.1-2010 may be purchased from ASHRAE at 1971 Tullie Circle NE., Atlanta, GA 30329, or by going to www.ashrae.org.

V. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of this final rule.

List of Subjects

10 CFR Part 429

Administrative practice and procedure, Confidential business information, Energy conservation, Household appliances, Reporting and recordkeeping requirements.

10 CFR Part 431

Administrative practice and procedure, Confidential business information, Energy conservation test procedures, Incorporation by reference, and Reporting and recordkeeping requirements.

Issued in Washington, DC, on December 2, 2016.

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

For the reasons stated in the preamble, DOE amends parts 429 and 431 of Chapter II of Title 10, Code of Federal Regulations as set forth below:

PART 429—CERTIFICATION, COMPLIANCE, AND ENFORCEMENT FOR CONSUMER PRODUCTS AND COMMERCIAL AND INDUSTRIAL EQUIPMENT

1. The authority citation for part 429 continues to read as follows:

Authority: 42 U.S.C. 6291-6317; 28 U.S.C. 2461 note.

2. Section 429.12 is amended by revising paragraph (b)(6) to read as follows:

§ 429.12 General requirements applicable to certification reports.

* * * * *

(b) * * *

(6) For each brand, the basic model number and the manufacturer's individual model number(s) in that basic model with the following exceptions: For external power supplies that are certified based on design families, the design family model number and the individual manufacturer's model numbers covered by that design family must be submitted for each brand. For distribution transformers, the basic model number or kVA grouping model number (depending on the certification method) for each brand must be submitted. For commercial HVAC, WH, and refrigeration equipment, an individual

manufacturer model number may be identified as a “private model number” if it meets the requirements of §429.7(b).

* * * * *

3. Section 429.53 is revised to read as follows:

§ 429.53 Walk-in coolers and walk-in freezers.

(a) Determination of represented value. (1) The requirements of §429.11 apply to walk-in coolers and walk-in freezers; and

(2) For each basic model of walk-in cooler and walk-in freezer refrigeration system, the annual walk-in energy factor (AWEF) must be determined either by testing, in accordance with §431.304 of this chapter and the provisions of this section, or by application of an AEDM that meets the requirements of §429.70 and the provisions of this section.

(i) Applicable test procedure. If the AWEF is determined by testing, refer to the following for the appropriate test procedure to use:

(A) Unit cooler test procedure. For unit coolers tested alone, use the test procedure in 10 CFR part 431, subpart R, appendix C. Follow the general testing

provisions in appendix C, sections 3.1 and 3.2, and the equipment-specific provisions in appendix C, section 3.3.

(B) Dedicated condensing unit test procedure. For dedicated condensing units tested alone, use the test procedure in 10 CFR part 431, subpart R, appendix C. Follow the general testing provisions in appendix C, sections 3.1 and 3.2, and the product-specific provisions in appendix C, section 3.4. Outdoor dedicated condensing refrigeration systems that are also designated for use in indoor applications must be tested and certified as both an outdoor dedicated condensing refrigeration system and indoor dedicated condensing refrigeration system.

(C) Single-Package dedicated system test procedure. For single-package dedicated systems, use the test procedure in 10 CFR part 431, subpart R, appendix C. Follow the general testing provisions in appendix C, sections 3.1 and 3.2, and the product-specific provisions in appendix C, section 3.3.

(D) Matched refrigeration system test procedure. For matched refrigeration systems, use the test procedure in 10 CFR part 431, subpart R, appendix C. Follow the general testing provisions in appendix C, sections 3.1 and 3.2, and the product-specific provisions in appendix C, section 3.3. It is not necessary to rate a matched refrigeration system if the constituent unit cooler(s) and dedicated condensing unit have been tested and rated as specified paragraphs (a)(2)(i)(A) and (B) of this section, respectively. However, if a manufacturer wishes to represent the efficiency of the matched refrigeration system as distinct from the efficiency of either constituent component, or if

the manufacturer cannot rate one or both of the constituent components using the specified method, the manufacturer must test and certify the matched refrigeration system as specified in this paragraph (a)(2)(i)(D).

(ii) Units to be tested. (A) If the represented value for a given refrigeration system basic model is determined through testing, the general requirements of §429.11 apply; and

(B) For each basic model, a sample of sufficient size shall be randomly selected and tested to ensure that any represented value of AWEF or other measure of energy efficiency of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(*1*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And $\bar{x}$ is the sample mean; n is the number of samples; and x_i is the i^{th} sample, or,

(*2*) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from appendix A to subpart B).

(C) The represented value of net capacity shall be the average of the capacities measured for the sample selected.

(iii) Alternative efficiency determination methods. In lieu of testing, pursuant to the requirements of §429.70 and the provisions of this section, a represented value of AWEF for a basic model of a walk-in cooler or walk-in freezer refrigeration system may be determined through the application of an AEDM, where:

(A) Any represented value of AWEF or other measure of energy efficiency of a basic model for which consumers would favor higher values shall be less than or equal to the output of the AEDM and greater than or equal to the Federal standard for that basic model.

(B) The represented value of net capacity must be the net capacity simulated by the AEDM.

(3) For each basic model of walk-in cooler and walk-in freezer panel, display door, and non-display door, the R-value and/or energy consumption must be determined by testing, in accordance with §431.304 of this chapter and the provisions of this section.

(i) Applicable test procedure. Refer to the following for the appropriate test procedure:

(A) Display door test procedure. For determining the energy consumption and rated surface area in square feet, use the test procedure in 10 CFR part 431, subpart R, appendix A.

(B) Non-display door test procedure. For determining the energy consumption and rated surface area in square feet, use the test procedure in 10 CFR part 431, subpart R, appendix A. For determining the R-value, use the test procedure in 10 CFR part 431, subpart R, appendix B.

(C) Panel test procedure. For determining the R-value, use the test procedure in 10 CFR part 431, subpart R, appendix B.

(ii) Units to be tested. (A) The general requirements of §429.11 apply; and

(B) For each basic model, a sample of sufficient size shall be randomly selected and tested to ensure that—

(*1*) Any represented value of door energy consumption or other measure of energy use of a basic model for which consumers would favor lower values shall be greater than or equal to the higher of:

(*i*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And $\bar{x}$ is the sample mean; n is the number of samples; and x_i is the i^{th} sample, or,

(*ii*) The upper 95 percent confidence limit (UCL) of the true mean divided by 1.05, where:

$$UCL = \bar{x} + t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from appendix A to subpart B).

(*2*) Any represented R-value or other measure of energy efficiency of a basic model for which consumers would favor higher values shall be less than or equal to the lower of:

(*i*) The mean of the sample, where:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

And $\bar{x}$ is the sample mean; n is the number of samples; and x_i is the i^{th} sample, or,

(*ii*) The lower 95 percent confidence limit (LCL) of the true mean divided by 0.95, where:

$$LCL = \bar{x} - t_{0.95}\left(\frac{s}{\sqrt{n}}\right)$$

And $\bar{x}$ is the sample mean; s is the sample standard deviation; n is the number of samples; and $t_{0.95}$ is the t statistic for a 95% one-tailed confidence interval with n-1 degrees of freedom (from appendix A to subpart B).

(b) Certification reports. (1) The requirements of §429.12 apply to manufacturers of walk-in cooler and walk-in freezer panels, doors, and refrigeration systems, and;

(2) Pursuant to §429.12(b)(13), a certification report must include the following public product-specific information:

(i) For doors: The door type, R-value of the door insulation, and a declaration that the manufacturer has incorporated the applicable design requirements. In addition, for those walk-in coolers and walk-in freezers with transparent reach-in doors and windows, the glass type of the doors and windows (e.g., double-pane with heat reflective treatment, triple-pane glass with gas fill), and the power draw of the antisweat heater in watts per square foot of door opening must also be included.

(ii) For walk-in cooler and walk-in freezer panels: The R-value of the insulation.

(iii) For walk-in cooler and walk-in freezer refrigeration systems: The installed motor's functional purpose (i.e., evaporator fan motor or condenser fan motor), its rated horsepower, and a declaration that the manufacturer has incorporated the applicable walk-in-specific design requirements into the motor.

(3) Pursuant to §429.12(b)(13), starting on June 5, 2017, a certification report must include the following public product-specific information in addition to the information listed in paragraph (b)(2) of this section:

(i) For walk-in cooler and walk-in freezer doors: The door energy consumption and rated surface area in square feet.

(ii) For refrigeration systems that are medium-temperature dedicated condensing units, medium-temperature single-package dedicated systems, or medium-temperature matched systems: The refrigeration system AWEF, net capacity, the configuration tested for certification (e.g., condensing unit only, unit cooler only, single-package dedicated system, or matched-pair), and if an indoor dedicated condensing unit is also certified as an outdoor dedicated condensing unit and, if so, the basic model number for the outdoor dedicated condensing unit.

(4) Pursuant to §429.12(b)(13), starting on June 5, 2017, a certification report must include the following product-specific information in addition to the information listed in paragraphs (b)(2) and (3) of this section:

(i) For walk-in cooler and walk-in freezer doors: the rated power of each light, heater wire, and/or other electricity consuming device associated with each basic model of display and non-display door; and whether such device(s) has a timer, control system, or other demand-based control reducing the device's power consumption.

(5) When certifying compliance to the AWEF refrigeration standards for WICF refrigeration systems except those specified in (b)(3)(ii) of this section, a certification report must include the following public product-specific information in addition to the information listed in paragraph (b)(2) of this section: For refrigeration systems that are low-temperature dedicated condensing units, low-temperature matched systems, low-temperature single-package dedicated systems, or medium and low-temperature unit coolers: The refrigeration system AWEF, net capacity, the configuration tested for certification (e.g., condensing unit only, unit cooler only, single-package dedicated system, or matched-pair), and if an indoor dedicated condensing unit is also certified as an outdoor dedicated condensing unit and, if so, the basic model number for the outdoor dedicated condensing unit.

4. Section 429.110 is amended by revising paragraph (e)(2) to read as follows:

§ 429.110 Enforcement testing.

* * * * *

(e) * * *

(2) For automatic commercial ice makers; commercial refrigerators, freezers, and refrigerator-freezers; refrigerated bottled or canned vending machines; commercial air conditioners and heat pumps; commercial packaged boilers; commercial warm air furnaces; commercial water heating equipment; and walk-in cooler and walk-in freezer refrigeration systems, DOE will use an initial sample size of not more than four units and follow the sampling plans in appendix B of this subpart (Sampling Plan for Enforcement Testing of Covered Equipment and Certain Low-Volume Covered Products).

* * * * *

5. Section 429.134 is amended by adding paragraph (p) to read as follows:

§ 429.134 Product-specific enforcement provisions.

* * * * *

(p) Walk-in coolers and walk-in freezers. (1) If DOE determines that a basic model of a panel, door, or refrigeration system for walk-in coolers or walk-in freezers fails to meet an applicable energy conservation standard, then the manufacturer of that basic model is responsible for the noncompliance. If DOE determines that a complete

walk-in cooler or walk-in freezer or component thereof fails to meet an applicable energy conservation standard, then the manufacturer of that walk-in cooler or walk-in freezer is responsible for the noncompliance with the applicable standard, except that the manufacturer of a complete walk-in cooler or walk-in freezer is not responsible for the use of components that were certified and labeled (in accordance with DOE labeling requirements) as compliant by another party and later found to be noncompliant with the applicable standard(s).

(2) Verification of refrigeration system net capacity. The net capacity of the refrigeration system basic model will be measured pursuant to the test requirements of 10 CFR part 431, subpart R, appendix C for each unit tested. The results of the measurement(s) will be averaged and compared to the value of net capacity certified by the manufacturer. The certified net capacity will be considered valid only if the average measured net capacity is within plus or minus five percent of the certified net capacity.

(i) If the certified net capacity is found to be valid, the certified net capacity will be used as the basis for calculating the AWEF of the basic model.

(ii) If the certified net capacity is found to be invalid, the average measured net capacity will serve as the basis for calculating the annual energy consumption for the basic model.

(3) Verification of door surface area. The surface area of a display door or non-display door basic model will be measured pursuant to the requirements of 10 CFR part

431, subpart R, appendix A for each unit tested. The results of the measurement(s) will be averaged and compared to the value of the surface area certified by the manufacturer. The certified surface area will be considered valid only if the average measured surface area is within plus or minus three percent of the certified surface area.

(i) If the certified surface area is found to be valid, the certified surface area will be used as the basis for calculating the maximum energy consumption (kWh/day) of the basic model.

(ii) If the certified surface area is found to be invalid, the average measured surface area will serve as the basis for calculating the maximum energy consumption (kWh/day) of the basic model.

(4) For each basic model of walk-in cooler and walk-in freezer door, DOE will calculate the door's energy consumption using the power listed on the nameplate of each electricity consuming device shipped with the door. If an electricity consuming device shipped with a walk-in door does not have a nameplate or such nameplate does not list the device's power, then DOE will use the device's "rated power" included in the door's certification report.

PART 431—ENERGY EFFICIENCY PROGRAM FOR CERTAIN COMMERCIAL AND INDUSTRIAL EQUIPMENT

6. The authority citation for part 431 continues to read as follows:

Authority: 42 U.S.C. 6291-6317; 28 U.S.C. 2461 note.

7. Section 431.302 is amended by:

a. Adding in alphabetical order, definitions for "Adaptive defrost," "Dedicated condensing unit," "Dedicated condensing refrigeration system," "Indoor dedicated condensing refrigeration system," "Matched condensing unit," "Matched refrigeration system," "Outdoor dedicated condensing refrigeration system," "Refrigerated storage space," "Single-package dedicated system," "Unit cooler," and "Walk-in process cooling refrigeration system"; and

b. Revising the definition of "refrigeration system."

The revision and additions read as follows:

§ 431.302 Definitions concerning walk-in coolers and walk-in freezers.

Adaptive defrost means a factory-installed defrost control system that reduces defrost frequency by initiating defrosts or adjusting the number of defrosts per day in response to operating conditions (e.g., moisture levels in the refrigerated space, measurements that represent coil frost load) rather than initiating defrost strictly based on compressor run time or clock time.

* * * * *

Dedicated condensing unit means a positive displacement condensing unit that is part of a refrigeration system (as defined in this section) and is an assembly that

(1) Includes 1 or more compressors, a condenser, and one refrigeration circuit; and

(2) Is designed to serve one refrigerated load.

Dedicated condensing refrigeration system means one of the following:

(1) A dedicated condensing unit;

(2) A single-package dedicated system; or

(3) A matched refrigeration system.

* * * * *

Indoor dedicated condensing refrigeration system means a dedicated condensing refrigeration system designated by the manufacturer for indoor use or for which there is no designation regarding the use location.

* * * * *

Matched condensing unit means a dedicated condensing unit that is distributed in commerce with one or more unit cooler(s) specified by the condensing unit manufacturer.

Matched refrigeration system (also called “matched-pair”) means a refrigeration system including the matched condensing unit and the one or more unit coolers with which it is distributed in commerce.

Outdoor dedicated condensing refrigeration system means a dedicated condensing refrigeration system designated by the manufacturer for outdoor use.

* * * * *

Refrigerated storage space means a space held at refrigerated (as defined in this section) temperatures.

* * * * *

Refrigeration system means the mechanism (including all controls and other components integral to the system’s operation) used to create the refrigerated environment in the interior of a walk-in cooler or walk-in freezer, consisting of:

(1) A dedicated condensing refrigeration system (as defined in this section); or

(2) A unit cooler.

Single-packaged dedicated system means a refrigeration system (as defined in this section) that is a single-package assembly that includes one or more compressors, a

condenser, a means for forced circulation of refrigerated air, and elements by which heat is transferred from air to refrigerant, without any element external to the system imposing resistance to flow of the refrigerated air.

* * * * *

Unit cooler means an assembly, including means for forced air circulation and elements by which heat is transferred from air to refrigerant, thus cooling the air, without any element external to the cooler imposing air resistance.

* * * * *

Walk-in process cooling refrigeration system means a refrigeration system that is capable of rapidly cooling food or other substances from one temperature to another. The basic model of such a system must satisfy one of the following three conditions:

(1) Be distributed in commerce with an insulated enclosure consisting of panels and door(s) such that the assembled product has a refrigerating capacity of at least 100 Btu/h per cubic foot of enclosed internal volume;

(2) Be a unit cooler having an evaporator coil that is at least four-and-one-half (4.5) feet in height and whose height is at least one-and-one-half (1.5) times the width. The height of the evaporator coil is measured perpendicular to the tubes and is also the

fin height, while its width is the finned length parallel to the tubes, as illustrated in Figure 1; or

(3) Be a dedicated condensing unit that is distributed in commerce exclusively with a unit cooler meeting description (2) or with an evaporator that is not a unit cooler, i.e., an evaporator that is not distributed or installed as part of a package including one or more fans.

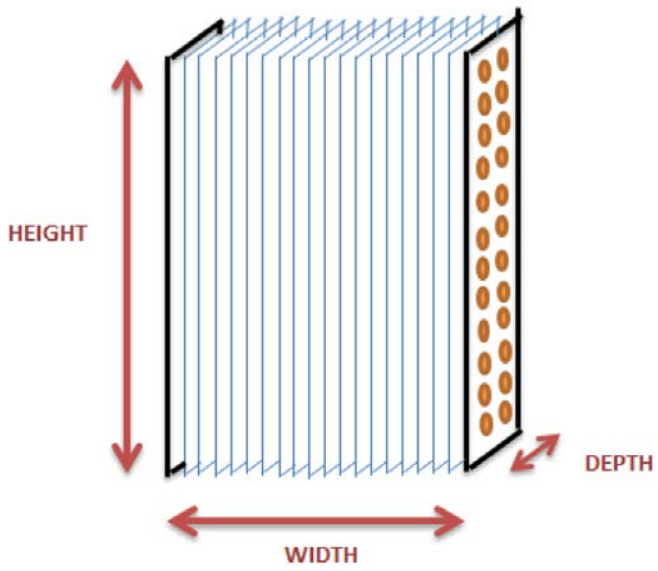

Figure 1: Evaporator Coil Dimensions

8. Section 431.303 is amended by:

a. Revising paragraph (a);

b. Revising paragraph (b)(1) and adding paragraph (b)(2);

d. Redesignating paragraphs (c) and (d) as paragraphs (d) and (e), respectively, and adding paragraph (c);

e. Revising the last sentence of newly redesignated paragraph (d)(1).

The additions and revisions read as follows:

§431.303 Materials incorporated by reference.

(a) *General*. Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. Any amendment to a standard by the standard-setting organization will not affect the DOE regulations unless and until amended by DOE. Material is incorporated as it exists on the date of the approval. To enforce any edition other than that specified in this section, the U.S. Department of Energy must publish a document in the Federal Register and the material must be available to the public. All approved material is available for inspection at U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Program, 6th Floor, 950 L'Enfant Plaza, SW., Washington, DC 20024, 202-586-2945, between 9 a.m. and 4 p.m., Monday through Friday, except Federal holidays, or go to: http://www1.eere.energy.gov/buildings/appliance_standards/], and is available from the sources listed below. It is also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030 or go to http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

(b) * * *

(1) ANSI/AHRI Standard 420-2008 ("AHRI 420-2008"), "Performance Rating of Forced-Circulation Free-Delivery Unit Coolers for Refrigeration," Copyright 2008, IBR approved for appendix C to subpart R of part 431.

(2) AHRI Standard 1250P (I-P)-2009 ("AHRI 1250-2009"), "Standard for Performance Rating of Walk-in Coolers and Freezers, (including Errata sheet dated December 2015), copyright 2009, except Table 15 and Table 16. IBR approved for appendix C to subpart R of part 431.

(c) ASHRAE. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., 1971 Tullie Circle NE., Atlanta, GA 30329, or www.ashrae.org/.

(1) ANSI/ASHRAE Standard 23.1-2010, ("ASHRAE 23.1-2010"), "Methods of Testing for Rating the Performance of Positive Displacement Refrigerant Compressors and Condensing Units that Operate at Subcritical Temperatures of the Refrigerant," ANSI approved January 28, 2010, IBR approved for appendix C to subpart R of part 431.

(2) [Reserved]

(d) * * *

(1) * * * IBR approved for appendix B to subpart R of part 431.

* * * * *

9. Section 431.304 is amended by revising paragraph (b) and removing paragraph (c) to read as follows:

§ 431.304 Uniform test method for the measurement of energy consumption of walk-in coolers and walk-in freezers.

* * * * *

(b) Determine the energy efficiency and/or energy consumption of the specified walk-in cooler and walk-in freezer components by conducting the appropriate test procedure as follows:

(1) Determine the U-factor, conduction load, and energy use of walk-in cooler and walk-in freezer display panels by conducting the test procedure set forth in appendix A to this subpart.

(2) Determine the energy use of walk-in cooler and walk-in freezer display doors and non-display doors by conducting the test procedure set forth in appendix A to this subpart.

(3) Determine the R-value of walk-in cooler and walk-in freezer non-display panels and non-display doors by conducting the test procedure set forth in appendix B to this subpart.

(4) Determine the AWEF and net capacity of walk-in cooler and walk-in freezer refrigeration systems by conducting the test procedure set forth in appendix C to this subpart.

10. Section 431.305 is added to read as follows:

§ 431.305 Walk-in cooler and walk-in freezer labeling requirements.

(a) Panel nameplate—(1) Required information. The permanent nameplate of a walk-in cooler or walk-in freezer panel for which standards are prescribed in § 431.306 must be marked clearly with the following information:

(i) The panel brand or manufacturer; and

(ii) One of the following statements, as appropriate:

(A) “This panel is designed and certified for use in walk-in cooler applications.”

(B) “This panel is designed and certified for use in walk-in freezer applications.”

(C) “This panel is designed and certified for use in walk-in cooler and walk-in freezer applications.”

(2) Display of required information. All orientation, spacing, type sizes, typefaces, and line widths to display this required information must be the same as or similar to the display of the other performance data included on the panel’s permanent nameplate. The permanent nameplate must be visible unless the panel is assembled into a completed walk-in.

(b) Door nameplate—(1) Required information. The permanent nameplate of a walk-in cooler or walk-in freezer door for which standards are prescribed in § 431.306 must be marked clearly with the following information:

(i) The door brand or manufacturer; and

(ii) One of the following statements, as appropriate:

(A) “This door is designed and certified for use in walk-in cooler applications.”

(B) “This door is designed and certified for use in walk-in freezer applications.”

(C) “This door is designed and certified for use in walk-in cooler and walk-in freezer applications.”

(2) Display of required information. All orientation, spacing, type sizes, typefaces, and line widths to display this required information must be the same as or similar to the display of the other performance data included on the door's permanent nameplate. The permanent nameplate must be visible unless the door is assembled into a completed walk-in.

(c) Refrigeration system nameplate—(1) Required information. The permanent nameplate of a walk-in cooler or walk-in freezer refrigeration system for which standards are prescribed in § 431.306 must be marked clearly with the following information:

(i) The refrigeration system brand or manufacturer;

(ii) The refrigeration system model number;

(iii) The date of manufacture of the refrigeration system (if the date of manufacture is embedded in the unit’s serial number, then the manufacturer of the refrigeration system must retain any relevant records to discern the date from the serial number);

(iv) If the refrigeration system is a dedicated condensing refrigeration system, and is not designated for outdoor use, the statement, “Indoor use only” (for a matched pair this must appear on the condensing unit); and

(v) One of the following statements, as appropriate:

(A) “This refrigeration system is designed and certified for use in walk-in cooler applications.”

(B) “This refrigeration system is designed and certified for use in walk-in freezer applications.”

(C) “This refrigeration system is designed and certified for use in walk-in cooler and walk-in freezer applications.”

(2) Process cooling refrigeration systems. The permanent nameplate of a process cooling refrigeration system (as defined in § 431.302) must be marked clearly with the statement, “This refrigeration system is designed for use exclusively in walk-in cooler and walk-in freezer process cooling refrigeration applications.”

(3) Display of required information. All orientation, spacing, type sizes, typefaces, and line widths to display this required information must be the same as or similar to the display of the other performance data included on the refrigeration system’s permanent nameplate. The model number must be in one of the following forms: “Model

____" or "Model number ____" or "Model No. ____." The permanent nameplate must be visible unless the refrigeration system is assembled into a completed walk-in.

(d) A manufacturer may not mark the nameplate of a component with the required information if the manufacturer has not submitted a certification of compliance for the relevant model.

(e) Disclosure of efficiency information in marketing materials. Each catalog that lists the component and all materials used to market the component must include:

(1) For panels—The R-value in the form "R-value__."

(2) For doors— The energy consumption in the form "EC__ kWh/day."

(3) For those refrigeration system for which standards are prescribed— The AWEF in the form "AWEF __."

(4) The information that must appear on a walk-in cooler or walk-in freezer component's permanent nameplate pursuant to paragraphs (a)-(c) of this section must also be prominently displayed in each catalog that lists the component and all materials used to market the component.

11. Appendix A to subpart R of part 431 is amended by:

a. Removing and reserving sections 3.2 and 3.3;

b. Revising section 3.4;

c. Redesignating sections 3.5 and 3.6 as sections 3.6 and 3.7.

d. Adding section 3.5;

e. Revising newly redesignated section 3.6; and

f. Revising Table A.1.

The revisions and additions read as follows:

Appendix A to Subpart R of Part 431—Uniform Test Method for the Measurement of Energy Consumption of the Components of Envelopes of Walk-In Coolers and Walk-In Freezers

* * * * *

3.2 [Reserved]

3.3 [Reserved]

3.4 Surface area means the area of the surface of the walk-in component that would be external to the walk-in cooler or walk-in freezer as appropriate.

3.5 Rated power means the electricity consuming device's power as specified on the device's nameplate. If the device does not have a nameplate or such nameplate does not list the device's power, then the rated power must be read from the device's product data sheet.

3.6 Rating conditions means, unless explicitly stated otherwise, all conditions shown in Table A.1 of this section.

Table A.1—Temperature Conditions

Internal Temperatures (cooled space within the envelope)	
Cooler Dry Bulb Temperature	35 °F
Freezer Dry Bulb Temperature	−10 °F
External Temperatures (space external to the envelope)	
Freezer and Cooler Dry Bulb Temperatures	75 °F.

* * * * *

11. Add appendices B and C to subpart R of part 431 to read as follows:

Appendix B to Subpart R of Part 431—Uniform Test Method for the Measurement of R-Value for Envelope Components of Walk-In Coolers and Walk-in Freezers

1.0 Scope

This appendix covers the test requirements used to measure the R-value of non-display panels and non-display doors of a walk-in cooler or walk-in freezer.

2.0 Definitions

The definitions contained in § 431.302 apply to this appendix.

3.0 Additional Definitions

3.1 Edge region means a region of the panel that is wide enough to encompass any framing members. If the panel contains framing members (e.g., a wood frame) then the width of the edge region must be as wide as any framing member plus an additional 2 in. ±0.25 in.

4.0 Test Methods, Measurements, and Calculations

4.1 The R value shall be the 1/K factor multiplied by the thickness of the panel.

4.2 The K factor shall be based on ASTM C518 (incorporated by reference; see § 431.303).

4.3 For calculating the R value for freezers, the K factor of the foam at 20 ±1 degrees Fahrenheit (average foam temperature) shall be used. Test results from a test sample 1 ±0.1-inches in thickness may be used to determine the R value of panels with various foam thickness as long as the foam is of the same final chemical form.

4.4 For calculating the R value for coolers, the K factor of the foam at 55 ±1 degrees Fahrenheit (average foam temperature) shall be used. Test results from a test sample 1 ±0.1-inches in thickness may be used to determine the R value of panels with various foam thickness as long as the foam is of the same final chemical form.

4.5 Foam shall be tested after it is produced in its final chemical form. For foam produced inside of a panel ("foam-in-place"), "final chemical form" means the foam is cured as intended and ready for use as a finished panel. For foam produced as board stock (typically polystyrene), "final chemical form" means after extrusion and ready for assembly into a panel or after assembly into a panel. Foam from foam-in-place panels must not include any structural members or non-foam materials. Foam produced as board stock may be tested prior to its incorporation into a final panel. A test sample 1 ±0.1-inches in thickness must be taken from the center of a panel and any protective skins or facers must be removed. A high-speed band-saw and a meat slicer are two types of recommended cutting tools. Hot wire cutters or other heated tools must not be used for cutting foam test samples. The two surfaces of the test sample that will contact the hot plate assemblies (as defined in ASTM C518 (incorporated by reference, see § 431.303)) must both maintain ±0.03 inches flatness tolerance and also maintain parallelism with respect to one another within ±0.03 inches. Testing must be completed within 24 hours of samples being cut for testing.

4.6 Internal non-foam member and/or edge regions shall not be considered when testing in accordance with ASTM C518 (incorporated by reference, see § 431.303).

4.7 For panels consisting of two or more layers of dissimilar insulating materials (excluding facers or protective skins), test each material as described in sections 4.1 through 4.6 of this appendix. For a panel with N layers of insulating material, the overall R-Value shall be calculated as follows:

$$R_{panel} = \sum_{i=1}^{N} \frac{t_i}{k_i}$$

Where:

k_i is the k factor of the ith material as measured by ASTM C518, (incorporated by reference, see § 431.303);

t_i is the thickness of the ith material that appears in the panel; and

N is the total number of material layers that appears in the panel.

Appendix C to Subpart R of Part 431—Uniform Test Method for the Measurement of Net Capacity and AWEF of Walk-In Cooler and Walk-in Freezer Refrigeration Systems

1.0 Scope

This appendix covers the test requirements used to determine the net capacity and the AWEF of the refrigeration system of a walk-in cooler or walk-in freezer.

2.0 Definitions

The definitions contained in § 431.302 and AHRI 1250-2009 (incorporated by reference; see § 431.303) apply to this appendix. When definitions in standards incorporated by reference are in conflict or when they conflict with this section, the hierarchy of precedence shall be in the following order: § 431.302, AHRI 1250-2009, and then either AHRI 420-2008 (incorporated by reference; see § 431.303) for unit coolers or ASHRAE 23.1-2010 (incorporated by reference; see § 431.303) for dedicated condensing units.

3.0 Test Methods, Measurements, and Calculations

Determine the Annual Walk-in Energy Factor (AWEF) and net capacity of walk-in cooler and walk-in freezer refrigeration systems by conducting the test procedure set forth in AHRI 1250-2009 (incorporated by reference; see § 431.303), with the modifications to that test procedure provided in this section. When standards that are incorporated by reference are in conflict or when they conflict with this section, the hierarchy of precedence shall be in the following order: § 431.302, AHRI 1250-2009, and then either AHRI 420-2008 (incorporated by reference; see § 431.303) or ASHRAE 23.1-2010 (incorporated by reference; see § 431.303).

3.1. General modifications: Test Conditions and Tolerances.

When conducting testing in accordance with AHRI 1250-2009 (incorporated by reference; see § 431.303), the following modifications must be made.

3.1.1. In Table 1, Instrumentation Accuracy, refrigerant temperature measurements shall have a tolerance of ±0.5 F for unit cooler in/out, ±1.0 F for all other temperature measurements.

3.1.2. In Table 2, Test Operating and Test Condition Tolerances for Steady-State Test, electrical power frequency shall have a Test Condition Tolerance of 1 percent.

3.1.3. In Table 2, the Test Operating Tolerances and Test Condition Tolerances for Air Leaving Temperatures shall be deleted.

3.1.4. In Tables 2 through 14, the Test Condition Outdoor Wet Bulb Temperature requirement and its associated tolerance apply only to units with evaporative cooling.

3.1.5. Tables 15 and 16 shall be modified to read as follows:

Table 15. Refrigerator Unit Cooler							
Test Description	**Unit Cooler Air Entering Dry-Bulb, ˚F**	**Unit Cooler Air Entering Relative Humidity, %**	**Saturated Suction Temp, ˚F**	**Liquid Inlet Saturation Temp, ˚F**	**Liquid Inlet Subcooling Temp, ˚F**	**Compressor Capacity**	**Test Objective**
Off Cycle Fan Power	35	<50	-	-	-	Compressor Off	Measure fan input power during compressor off cycle
Refrigeration Capacity Suction A	35	<50	25	105	9	Compressor On	Determine Net Refrigeration Capacity of Unit Cooler
Refrigeration Capacity Suction B	35	<50	20	105	9	Compressor On	Determine Net Refrigeration Capacity of Unit Cooler
Note: Superheat to be set according to equipment specification in equipment or installation manual. If no superheat specification is given, a default superheat value of 6.5 °F shall be used. The superheat setting used in the test shall be reported as part of the standard rating.							

Table 16. Freezer Unit Cooler							
Test Description	**Unit Cooler Air Entering Dry-Bulb, ˚F**	**Unit Cooler Air Entering Relative Humidity, %**	**Saturated Suction Temp, ˚F**	**Liquid Inlet Saturation Temp, ˚F**	**Liquid Inlet Subcooling Temp, ˚F**	**Compressor Capacity**	**Test Objective**
Off Cycle Fan Power	-10	<50	-	-	-	Compressor Off	Measure fan input power during compressor off cycle
Refrigeration Capacity Suction A	-10	<50	-20	105	9	Compressor On	Determine Net Refrigeration Capacity of Unit Cooler
Refrigeration Capacity Suction B	-10	<50	-26	105	9	Compressor On	Determine Net Refrigeration Capacity of Unit Cooler
Defrost	-10	Various	-	-	-	Compressor Off	Test according to Appendix C Section C11
Note: Superheat to be set according to equipment specification in equipment or installation manual. If no superheat specification is given, a default superheat value of 6.5 °F shall be used. The superheat setting used in the test shall be reported as part of the standard rating.							

3.2. General Modifications: Methods of Testing

When conducting testing in accordance with appendix C of AHRI 1250-2009 (incorporated by reference; see § 431.303), the following modifications must be made.

3.2.1. In appendix C, section C3.1.6, any refrigerant temperature measurements upstream and downstream of the unit cooler may use sheathed sensors immersed in the flowing refrigerant instead of thermometer wells.

3.2.2. It is not necessary to perform composition analysis of refrigerant (appendix C, section C3.3.6) or refrigerant oil concentration testing (appendix C, section C3.4.6).

3.2.3. In appendix C, section C3.4.5, for verification of sub-cooling downstream of mass flow meters, only the sight glass and a temperature sensor located on the tube surface under the insulation are required.

3.2.4. In appendix C, section C3.5, regarding unit cooler fan power measurements, for a given motor winding configuration, the total power input shall be measured at the highest nameplate voltage. For three-phase power, voltage imbalances shall be no more than 2 percent from phase to phase.

3.2.5. In the test setup (appendix C, section C8.3), the liquid line and suction line shall be constructed of pipes of the manufacturer-specified size. The pipe lines shall be insulated with a minimum total thermal resistance equivalent to 1⁄2-inch thick insulation having a flat-surface R-Value of 3.7 ft^2-°F-hr/Btu per inch or greater. Flow meters need not be insulated but must not be in contact with the floor. The lengths of the connected liquid line and suction line shall be 25 feet +/- 3 inches, not including the requisite flow meters, each. Of this length, no more than 15 feet shall be in the conditioned space. Where there are multiple branches of piping, the maximum length of piping applies to each branch individually as opposed to the total length of the piping.

3.3. Matched systems, single-package dedicated systems, and unit coolers tested alone: Use the test method in AHRI 1250-2009 (incorporated by reference; see § 431.303), appendix C as the method of test for matched refrigeration systems, single-package dedicated systems, or unit coolers tested alone, with the following modifications:

3.3.1. For unit coolers tested alone, use test procedures described in AHRI 1250-2009 (incorporated by reference; see § 431.303) for testing unit coolers for use in mix-match system ratings, except that for the test conditions in Tables 15 and 16, use the Suction A saturation condition test points only. Also for unit coolers tested alone, use the calculations in section 7.9 to determine

AWEF and net capacity described in AHRI 1250-2009_ for unit coolers matched to parallel rack systems.

3.3.2. In appendix C, section C.13, the version of AHRI Standard 420 used for test methods, requirements, and procedures shall be AHRI 420-2008 (incorporated by reference; see § 431.303).

3.3.3. Use appendix C, section C10 of AHRI 1250-2009 for off-cycle evaporator fan testing, with the exception that evaporator fan controls using periodic stir cycles shall be adjusted so that the greater of a 50% duty cycle (rather than a 25% duty cycle) or the manufacturer default is used for measuring off-cycle fan energy. For adjustable-speed controls, the greater of 50% fan speed (rather than 25% fan speed) or the manufacturer's default fan speed shall be used for measuring off-cycle fan energy. Also, a two-speed or multi-speed fan control may be used as the qualifying evaporator fan control. For such a control, a fan speed no less than 50% of the speed used in the maximum capacity tests shall be used for measuring off-cycle fan energy.

3.3.4. Use appendix C, section C11 of AHRI 1250-2009 (incorporated by reference, see § 431.303) for defrost testing. The Frost Load Condition Defrost Test (C11.1.1) is optional.

3.3.4.1. If the frost load condition defrost test is performed:

3.3.4.1.1 Operate the unit cooler at the dry coil conditions as specified in appendix C, section C11.1 to obtain dry coil defrost energy, DF_d, in W-h.

3.3.4.1.2 Operate the unit cooler at the frost load conditions as specified in appendix C, sections C11.1 and C11.1.1 to obtain frosted coil defrost energy, DF_f, in W-h.

3.3.4.1.3 The number of defrosts per day, N_{DF}, shall be calculated from the time interval between successive defrosts from the start of one defrost to the start of the next defrost at the frost load conditions.

3.3.4.1.4 Use appendix C, equations C13 and C14 in section C11.3 to calculate, respectively, the daily average defrost energy, DF, in W-h and the daily contribution of the load attributed to defrost Q_{DF} in Btu.

3.3.4.1.5 The defrost adequacy requirements in appendix C, section C11.3 shall apply.

3.3.4.2. If the frost load test is not performed:

3.3.4.2.1 Operate the unit cooler at the dry coil conditions as specified in appendix C, section C11.1 to obtain dry coil defrost energy, DF_d, in W-h.

3.3.4.2.2 The frost load defrost energy, DF_f, in W-h shall be equal to 1.05 multiplied by the dry coil energy consumption, DF_d, measured using the dry coil condition test in appendix C, section C11.1.

3.3.4.2.3 The number of defrosts per day N_{DF} used in subsequent calculations shall be 4.

3.3.4.2.4 Use appendix C, equation C13 in section C11.3 to calculate the daily average defrost energy, DF, in W-h.

3.3.4.2.5 The daily contribution of the load attributed to defrost Q_{DF} in Btu shall be calculated as follows:

$$Q_{DF} = 0.95 \times 3.412 \text{ Btu/W-h} \times \frac{2.05 \times DF_d}{2} \times 4$$

Where:

DF_d = the defrost energy, in W-h, measured at the dry coil condition

3.3.5. If a unit has adaptive defrost, use appendix C, section C11.2 of AHRI 1250-2009 as follows:

3.3.5.1. When testing to certify to the energy conservation standards in § 431.306, do not perform the optional test for adaptive or demand defrost in appendix C, section C11.2.

3.3.5.2. When determining the represented value of the calculated benefit for the inclusion of adaptive defrost, conduct the optional test for adaptive or demand defrost in appendix C, section C11.2 to establish the maximum time interval allowed between dry coil defrosts. If this time is greater than 24 hours, set its value to 24 hours. Then, calculate N_{DF} (the number of defrosts per day) by averaging the time in hours between successive defrosts for the dry coil condition with the time in hours between successive defrosts for the frosted coil condition, and dividing 24 by this average time. (The time between successive defrosts for the frosted coil condition is found as specified in section 3.3.4 of this appendix C of AHRI 1250-2009: that is, if the optional frosted coil test was performed, the time between successive defrosts for the frosted coil condition is found by performing the frosted coil test as specified in section 3.3.4.1 of this appendix; and if the optional frosted coil test was not performed, the time between successive defrosts for the frosted coil condition shall be set to 4 as specified in section 3.3.4.2. of this appendix) Use this new value of N_{DF} in subsequent calculations.

3.3.6. For matched refrigeration systems and single-package dedicated systems, calculate the AWEF using the calculations in AHRI 1250-2009

(incorporated by reference; see § 431.303), section 7.4, 7.5, 7.6, or 7.7, as applicable.

3.3.7. For unit coolers tested alone, calculate the AWEF and net capacity using the calculations in AHRI 1250-2009, (incorporated by reference; see § 431.303), section 7.9. If the unit cooler has variable-speed evaporator fans that vary fan speed in response to load, then:

3.3.7.1. When testing to certify compliance with the energy conservation standards in § 431.306, fans shall operate at full speed during on-cycle operation. Do not conduct the calculations in AHRI 1250-2009, section 7.9.3. Instead, use AHRI 1250-2009, section 7.9.2 to determine the system's AWEF.

3.3.7.2. When calculating the benefit for the inclusion of variable-speed evaporator fans that modulate fan speed in response to load for the purposes of making representations of efficiency, use AHRI 1250-2009, section 7.9.3 to determine the system AWEF.

3.4. <u>Dedicated condensing units that are not matched for testing and are not single-package dedicated systems.</u>

3.4.1. Refer to appendix C, section C.12 of AHRI 1250-2009 (incorporated by reference; see § 431.303), for the method of test for dedicated condensing

units. The version of ASHRAE Standard 23 used for test methods, requirements, and procedures shall be ANSI/ASHRAE Standard 23.1-2010 (incorporated by reference; see § 431.303). When applying this test method, use the applicable test method modifications listed in sections 3.1 and 3.2 of this appendix. For the test conditions in AHRI 1250-2009, Tables 11, 12, 13, and 14, use the Suction A condition test points only.

3.4.2. Calculate the AWEF and net capacity for dedicated condensing units using the calculations in AHRI 1250-2009 (incorporated by reference; see § 431.303) section 7.8. Use the following modifications to the calculations in lieu of unit cooler test data:

3.4.2.1. For calculating enthalpy leaving the unit cooler to calculate gross capacity, (a) the saturated refrigerant temperature (dew point) at the unit cooler coil exit, T_{evap}, shall be 25 °F for medium-temperature systems (coolers) and -20 °F for low-temperature systems (freezers), and (b) the refrigerant temperature at the unit cooler exit shall be 35 °F for medium-temperature systems (coolers) and -14 °F for low-temperature systems (freezers). For calculating gross capacity, the measured enthalpy at the condensing unit exit shall be used as the enthalpy entering the unit cooler.

3.4.2.2. The on-cycle evaporator fan power in watts, $EF_{comp,on}$, shall be calculated as follows:

For medium-temperature systems (coolers), $EF_{comp,on} = 0.013 \times q_{mix,cd}$

For low-temperature systems (freezers), $EF_{comp,on} = 0.016 \times q_{mix,cd}$

Where:

$q_{mix,cd}$ is the gross cooling capacity of the system in Btu/h, found by a single test at the Capacity A, Suction A condition for outdoor units and the Suction A condition for indoor units.

3.4.2.3. The off-cycle evaporator fan power in watts, $EF_{comp,off}$, shall be calculated as follows:

$EF_{comp,off} = 0.2 \times EF_{comp,on}$

Where:

$EF_{comp,on}$ is the on-cycle evaporator fan power in watts.

3.4.2.4. The daily defrost energy use in watt-hours, DF, shall be calculated as follows:

For medium-temperature systems (coolers), DF = 0

For low-temperature systems (freezers), $DF = 8.5 \times 10^{-3} \times q_{mix,cd}^{1.27} \times N_{DF}$

Where:

$q_{mix,cd}$ is the gross cooling capacity of the system in Btu/h, found by a single test at the Capacity A, Suction A condition for outdoor units and the Suction A condition for indoor units, and

N_{DF} is the number of defrosts per day, equal to 4.

3.4.2.5. The daily defrost heat load contribution in Btu, Q_{DF}, shall be calculated as follows:

For medium-temperature systems (coolers), $Q_{DF} = 0$

For low-temperature systems (freezers), $Q_{DF} = 0.95 \times DF \times 3.412$

Where:

DF is the daily defrost energy use in watt-hours.

3.5 Hot Gas Defrost Refrigeration Systems

For all hot gas defrost refrigeration systems, remove the hot gas defrost mechanical components and disconnect all such components from electrical power.

3.5.1 Hot Gas Defrost Dedicated Condensing Units Tested Alone: Test these units as described in section 3.4 of this appendix for electric defrost dedicated condensing units that are not matched for testing and are not single-package dedicated systems.

3.5.2 Hot Gas Defrost Matched Systems, Single-package Dedicated Systems, and Unit Coolers Tested Alone: Test these units as described in section 3.3 of this appendix for electric defrost matched systems, single-package dedicated systems, and unit coolers tested alone, but do not conduct defrost tests as described in sections 3.3.4 and 3.3.5 of this appendix. Calculate daily defrost energy use as described in section 3.4.2.4 of this appendix. Calculate daily defrost heat contribution as described in section 3.4.2.5 of this appendix.