



Preparing for DOE Compliance on Walk-In Coolers and Freezers

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Speaker



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Julie Havenar joined Emerson in 2015. As the company's product manager for condensing units, she focuses her efforts on the development and marketing of condensing units to serve both the foodservice and food retail markets. Prior to her role in product management, she has held roles in strategic pricing and market analysis.

Julie earned a bachelor's degree in marketing and decision sciences from Miami University.

Disclaimer

This presentation is intended to highlight changing developments in the law and industry topics. The law is frequently evolving and information and publications in this presentation may not reflect the latest changes in the law or legal interpretations. The statements and information provided in this presentation should not be construed as legal advice or legal opinion regarding any specific facts or circumstances, but is intended for general informational purposes only. The views and statements expressed during this presentation are the personal opinions of the presenter and do not represent those of Emerson Climate Technologies, Inc. or its affiliated companies. You should consult an attorney about your situation and specific facts and you should not act on any of the information in this presentation as the information may not be applicable to your situation. Although all statements and information contained herein are believed to be accurate and reliable, they are presented without warranty of any kind. Information provided herein does not relieve the user from the responsibility of carrying out its own tests and experiments. Statements or suggestions concerning the use of materials and processes are made without representation or warranty that any such use is free of patent infringement and are not recommendations to infringe on any patents. This presentation may not be copied or redistributed without the express written consent of Emerson Climate Technologies, Inc.

Agenda

Ruling Overview

Scope and Definitions

Industry Impact

How Emerson Can Help

Q&A Session



Key Takeaways

1 How this ruling impacts you

2 What you are responsible for doing

3 How Emerson can help



Please Contact Us for Additional Assistance.

Polling Questions

How many years of experience do you have with the refrigeration industry?

- Less than 1 year
- 1–5 years
- 5–10 years
- More than 10 years

How familiar are you with the DOE 2020 walk-in regulations?

- Extremely familiar
- Somewhat familiar
- Not at all familiar

How prepared do you feel for the DOE walk-in requirements coming in 2020?

- Extremely prepared
- Somewhat prepared
- Not at all prepared

Ruling Overview

Final Ruling

- In a final rule published on June 3, 2014, the Department of Energy (DOE) prescribed performance-based standards for walk-in coolers and freezers (WICFs).
- After issuing test procedures and publishing an updated ruling, on July 10, 2017, the DOE issued its final rule governing energy conservation standards for WICFs.



Standards Applied To...	Minimum Efficiency Levels Based Upon...
★ Walk-in Refrigeration Systems: Condensing Units & Unit Coolers	Annual W alk-In E nergy F actor (AWEF)
Walk-in Panels	R-Value
Walk-in Doors	Maximum Energy Consumption

DOE 2020 Regulations Will Impact Walk-In Refrigeration Products.

AWEF Calculation

- DOE uses a metric created by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) called the **Annual Walk-In Energy Factor (AWEF)**.
- AWEF calculation is based on:
 - “a ratio of the total heat, not including the heat generated by the operation of refrigeration systems, removed, in Btu, from a walk-in box during a one-year period of usage for refrigeration to the total energy input of refrigeration systems, in watt-hours, during the same period.”*
- For more details, please reference the AHRI 1250-2009 standard.

AWEF Refrigeration Requirements

AWEF refrigeration requirements vary based upon capacity and application:

Equipment Class	Minimum AWEF (Btu/W-h)
Dedicated condensing system — medium, indoor	5.61
Dedicated condensing system — medium, outdoor	7.60
Dedicated condensing system — low, indoor with a net capacity (q_{net}^*) of:	
< 6,500 Btu/h	$9.091 \times 10^{-5} \times q_{net} + 1.81$
$\geq 6,500$ Btu/h	2.40
Dedicated condensing system — low, outdoor with a net capacity (q_{net}) of:	
< 6,500 Btu/h	$6.522 \times 10^{-5} \times q_{net} + 2.73$
$\geq 6,500$ Btu/h	3.15
Unit cooler — medium	9.00
Unit cooler — low, with a net capacity (q_{net}) of:	
< 15,500 Btu/h	$1.575 \times 10^{-5} \times q_{net} + 3.91$
$\geq 15,500$ Btu/h	4.15

* q_{net} is net capacity as determined in accordance with §431.304 and certified in accordance with 10 CFR part 429.

Please reference federal law for panel and door requirements.

AWEF Requirements Vary by Capacity and Application.

Refrigerant Requirements

The DOE **does not** specify the kind of refrigerant that should be used to achieve compliance; however, ratings will vary by refrigerant.



For additional information on refrigerant regulations, please visit our regulations webpage at:

Climate.Emerson.com/Refrigeration-Regulations

AWEF Requirements Vary by Refrigerant.

Compliance Dates

Although the compliance date for a dedicated condensing system for medium-temperature applications has been in place since June 5, 2017, the DOE has ***delayed enforcement*** for this product category until the dates shown below:

Application (CDU)		Enforcement Date
Medium-Temp	Indoor	January 1, 2020
	Outdoor	
Low-Temp	Indoor	July 10, 2020
	Outdoor	



Enforcement Dates Will Begin in 2020.

Scope and Definitions

Scope and Definitions

Scope of Ruling:

- Enclosed walk-in coolers and freezers that can be walked into and have a total chilled storage area of **less than 3,000 square feet**
- Applies to condensing units and unit coolers designed to provide **one** refrigerated load
- Products designed and marketed exclusively for medical, scientific or research purposes are *excluded from this ruling*.

Definition of Walk-In Coolers and Freezers:

- “Walk-in cooler” — enclosed storage space refrigerated to temperatures above 32 degrees Fahrenheit
- “Walk-in freezer” — enclosed storage space refrigerated to temperatures at or below 32 degrees Fahrenheit

Scope and Definitions *(cont.)*

DOE rule impacts the following WICF refrigeration systems:

- Condensing units that are assembled to construct a **new WICF**
- Condensing units that are used to replace an existing, previously installed WICF component (**retrofit**)
- Condensing units used within **packaged systems**

Important note: Contractors and wholesalers can still use and stock condensing units that were manufactured before the DOE enforcement dates.



DOE Rule Impacts Both New and Retrofit Applications.

WICF Products Not Impacted

WICF refrigeration equipment NOT impacted by this ruling:

- Equipment intended solely for scientific, medical or research purposes
- Condensing units solely designed and marketed to serve more than one WICF refrigerated load or other pieces of refrigeration equipment
- WICFs with floor space exceeding 3,000 square feet
- Compressor-based racks that serve multiple refrigeration loads
- Remote air-cooled condensers and fluid coolers not used for WICFs



Not All WICF Equipment Is Impacted by This Ruling.

Industry Impact

Industry Impact

- **Equipment manufacturers must manufacture compliant products and demonstrate certification and compliance in the following ways:**
 1. Database registration (CCMS database)
 2. Marketing materials disclosure
 3. Permanent nameplate marking



Regulations Impact All Commercial Refrigeration Stakeholders.

Equipment Manufacturer Impact *Database registration*

The screenshot shows the U.S. Department of Energy website. The header includes the logo for Energy Efficiency & Renewable Energy, the text 'APPLIANCE & EQUIPMENT STANDARDS PROGRAM | CCMS', and navigation links for 'EERE Home', 'Programs & Offices', and 'Consumer Information'. A search bar is located in the top right. The main content area is titled 'Compliance Certification Management System' and features a navigation menu on the left with options like 'Home', 'eeCompass', 'Compliance Certification Management System (CCMS)', 'Login to CCMS', 'Product Templates', 'Registration and Authorization Forms', 'Help', 'Instructions and Manufacturer Codes for Submitting Supplemental Testing Instructions', 'Compliance Certification Database', 'Test Procedure Guidance for Appliances and Commercial Equipment', 'Appliances and Commercial Equipment Standards', 'Certification and Enforcement', 'Contacts', and 'News'. The main text area contains a welcome message and a description of the CCMS system. A 'News' section on the right lists several updates with dates, and a 'More news...' button is provided.

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy
APPLIANCE & EQUIPMENT STANDARDS PROGRAM | CCMS

EERE Home | Programs & Offices | Consumer Information

Search Site Search

Regulations & Compliance » Compliance Certification Management System (CCMS) Site Map Print

Compliance Certification Management System

Home

eeCompass

Compliance Certification Management System (CCMS)

Login to CCMS

Product Templates

Registration and Authorization Forms

Help

Instructions and Manufacturer Codes for Submitting Supplemental Testing Instructions

Compliance Certification Database

Test Procedure Guidance for Appliances and Commercial Equipment

Appliances and Commercial Equipment Standards

Certification and Enforcement

Contacts

News

Welcome to the Compliance Certification Management System (CCMS), managed by the DOE Appliance Standards Program.

CCMS is the on-line interface through which manufacturers of covered products and commercial equipment must electronically submit compliance and certification information to DOE. This on-line system permits manufacturers to create, submit and manage certification reports using product or equipment specific templates. All templates include the compliance statement and certification report on an easy-to-use Microsoft Excel spreadsheet. CCMS will automatically record the date and time of your submission and forward it to the appropriate office in the Building Technologies Program.

News

Revised Template for Walk-In Cooler and Freezer Refrigeration Systems, v5.2 Template
Aug 06, 2019

External Power Supplies, Template for Annual Reporting of Spare and Service Part Sales Exempt from Level VI Standards, v5.1
Jul 26, 2019

General Pumps, v5.0 Template
Jul 11, 2019

Doors for Walk-In Coolers and Freezers, v5.3 - Repost from 3/12/2019
May 21, 2019

Furnace Fans, v5.1 Template - Repost from 3/8/2019
May 21, 2019

More news...

Database can be found here: https://regulations.doe.gov/certification-data/#q=Product_Group_s%3A*

Manufacturers Must Submit Annual Certification Report.

Equipment Manufacturer Impact

Marketing material disclosure

WICF equipment and component manufacturers must disclose AWEF ratings in their respective marketing materials, such as product sales sheets and catalog listings of affected equipment.

Copeland Scroll™ Outdoor Refrigeration Unit
For medium and low temp walk-in applications



The Copeland Scroll Outdoor Refrigeration Unit (X-Line) sets a new standard for energy efficiency, reliability, and installation flexibility. With new smaller capacities now available down to 1/2 HP, and expanded refrigerant approval, its industry-leading on-board diagnostics and system protection are available for more applications commonly found in today's food service establishments.

The Copeland Scroll Outdoor Refrigeration Unit was designed based on three factors:

- Energy Efficiency**
Scroll compressor technology, variable speed fan motors, large capacity condenser coils, and advanced control algorithms, work together to significantly reduce energy consumption.
- Reliability**
Equipment reliability is greatly enhanced by combining the proven reliability of Copeland Scroll compressors with advanced CoreSense™ technology. Each unit has built-in CoreSense Diagnostics and protection that can alert and record alarms independently, or communicate with building management systems.
- Flexibility**
The ultra-quiet variable-speed fan motor significantly reduces exterior sound levels and is combined with a lightweight weather-resistant cabinet, slim footprint, and optional wall mounting capability to deliver unmatched installation flexibility.

Sound Operating Range for 1.5-6 HP Units!



11 to 16 dBA Lower for Ultra-Quiet Operation

EMERSON. CONSIDER IT SOLVED.


Requirements for Annual Walk-In Energy Factor (AWEF) ratings for

R-407A		R-407A		R-407C		R-449A/R-449A	
AWEF	Capacity	AWEF	Capacity	AWEF	Capacity	AWEF	Capacity
18.29	7.219	18.81	8.273	8.84	7.219	19	
18.24	8.793	18.28	9.893	18.24	8.793	18	
11.32	18.288	18.27	8.278	11	18.288	18	
8.27	17.488	8.22	18.888	8.28	18.288	8.27	
18.82	17.888	8.82	12.888	18.81	12.888	8.81	
18.42	15.288	8.28	14.888	8.84	14.458	8.22	
18.47	18.288	18.18	17.458	18.22	17.288	8.88	
18.81	28.888	18.22	18.218	18.22	18.218	8.88	
18.47	28.288	18.81	23.288	18.88	28.818	18.24	
18.48	28.288	18.22	22.218	18.83	22.888	18.83	
18.28	21.218	18.27	21.488	18.28	22.888	18.41	
18.28	28.288	8.22	25.488	18.22	28.288	18.22	
8.21	42.888	8.22	42.888	8.27	44.888	8.21	
8.28	31.888	8.47	31.888	8.42	32.888	8.42	

See Emerson.com/IR for complete specifications.

Low Temp Capacity @ 5°F Ambient (-1°F Evap)		R-407A		R-407C		R-449A	
Unit	Compressor	Capacity	Capacity	Capacity	Capacity	Capacity	Capacity
379A-8002	2987KCE	4.883	2.588	2.288	2.818		
379A-8005	2987KCE	5.408	4.788	4.888	4.818		
379A-8102	2288KCE	5.788	N/A	N/A	N/A		
379A-8102	2987KCE	8.823	5.888	5.478	5.283		
379A-8172	2211KCE	8.218	N/A	N/A	N/A		
379A-8222	2213KCE	8.288	N/A	N/A	N/A		
379A-812	2987KCE	18.178	2.228	2.218	2.278		
379A-8382	2088KCE	12.818	8.224	8.111	11.448		
379A-8222	2211KCE	12.288	N/A	N/A	N/A		
379A-8222C	2088KCE	18.288	12.433	11.448	12.817		
379A-8272CPV	2011KCE	18.888	18.281	14.513	17.188		
379A-8432	2237KCE	18.888	N/A	N/A	N/A		
379A-8382	2229KCE	22.288	N/A	N/A	N/A		
379A-8482	2011KCE	24.218	21.872	18.288	22.272		
379A-8572C	2011KCE	28.818	22.183	28.288	25.884		
379A-812CPV	2011KCE	28.818	22.822	22.448	24.422		
379A-8882	2248KCE	27.288	N/A	N/A	N/A		
379A-8882	2011KCE	22.218	28.271	25.277	25.877		

Copeland Scroll™ X-Line Outdoor Refrigeration Units



Product Information
Horsepower: 3/4 – 6
Temperature Applications: Low/Medium/High
Refrigerants: R-134a, R-22, R-404A, R-407A, R-407C, R-449A, R-449A, R-507
Installation Applications: A variety of applications including walk-in boxes, display cases, island cases, soft serve

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Temperature °F

°F	90	100	110	120	130	140
1.12	1.06	1.00	.94	.88	.82	.75
1.14	1.07	1.00	.93	.86	.79	.71
1.12	1.06	1.00	.94	.88	.82	.76
1.20	1.10	1.00	.90	.80	.70	.50

Variable Speed Condense Fan	UL
Demand Cooling	
Low Temp (2-6°F) - Enhanced	
Super Low Temp (10-15°F) - Super	
Low Temp (10-15°F) - Super	
Med Temp - Liquid Injection	
Two-Way Communication	
CoreSense™ Diagnostics / Protection	
Listed	
Recognized	

201105-4_X-Line R4 (6/11) 2 Emerson Condensing Unit Catalog

Manufacturers Must Disclose AWEF Ratings in Their Marketing Materials.

Equipment Manufacturer Impact

Permanent nameplate marking

- DOE compliance statements:
 - “This refrigeration system is designed and certified for use in walk-in cooler applications.”
 - “This refrigeration system is designed and certified for use in walk-in freezer applications.”
 - “This refrigeration system is designed and certified for use in walk-in cooler and walk-in freezer applications.”
- If the refrigeration system is a dedicated condensing refrigeration system, and is not designated for outdoor use, the statement “Indoor use only” will be displayed.
- AWEF scores are not mandated to be on nameplates; however, scores may be added at the discretion of the manufacturer.



The image shows a nameplate with a barcode on the left and a table on the right. The table has four columns: 'REFRIGERANT', 'REFRIGERANT CHARGE (LBS.)', 'INDOOR AWEF', and 'OUTDOOR AWEF'. The 'REFRIGERANT' column lists various refrigerant types (4A, 5A, 7A, 13A, 22A, 7C). The 'REFRIGERANT CHARGE' column is empty. The 'INDOOR AWEF' and 'OUTDOOR AWEF' columns contain numerical values for each refrigerant type.

REFRIGERANT	REFRIGERANT CHARGE (LBS.)	INDOOR AWEF	OUTDOOR AWEF
4A		6.26	7.83
5A		6.27	9.05
7A		6.10	8.36
13A		5.87	8.35
22A		5.87	8.35
7C		5.88	8.50

Manufacturers Must Follow Nameplate Requirements.

Industry Impact

- **Wholesalers** must be prepared for changing inventories and begin to carry only AWEF-compliant products if they are manufactured **after** the 2020 enforcement date.
- **Contractors** must understand that if they replace a condensing unit with one manufactured after the DOE enforcement dates, it must be an AWEF-compliant unit. *However, older units and inventory may still be used based upon the date of manufacturing.*



Regulations Impact All Commercial Refrigeration Stakeholders.

Industry Impact *(cont.)*

- **Design consultants** must be well-versed in the regulatory impacts to advise end users in the selection of energy-compliant, sustainable systems.
- **End users** need to consider selecting future-proof equipment that aligns with their long-term refrigeration strategies.



Regulations Impact All Commercial Refrigeration Stakeholders.

How Emerson Can Help

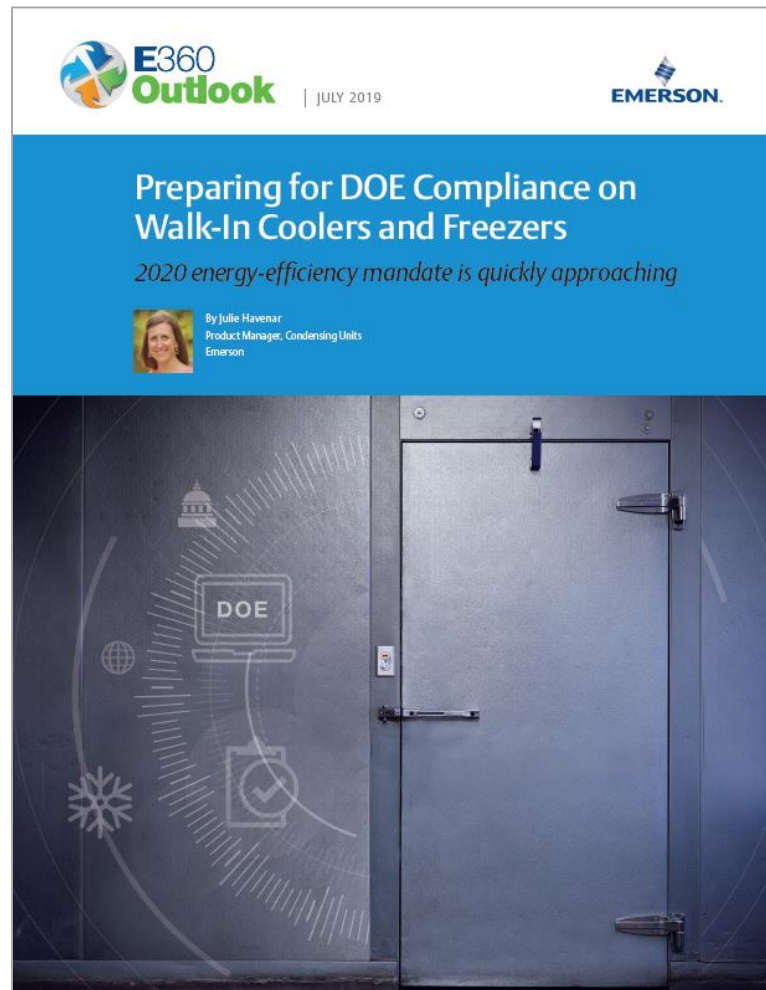
How Emerson Can Help

- If you are interested in further training or information, please reach out to your Emerson sales representative or contact us at E360@Emerson.com.
- If you have additional questions regarding refrigerant regulations, please visit one of the following webpages:
 - Regulations Webpage: Climate.Emerson.com/Webinar33
 - E360 Content Hub: Climate.Emerson.com/E360ContentHub

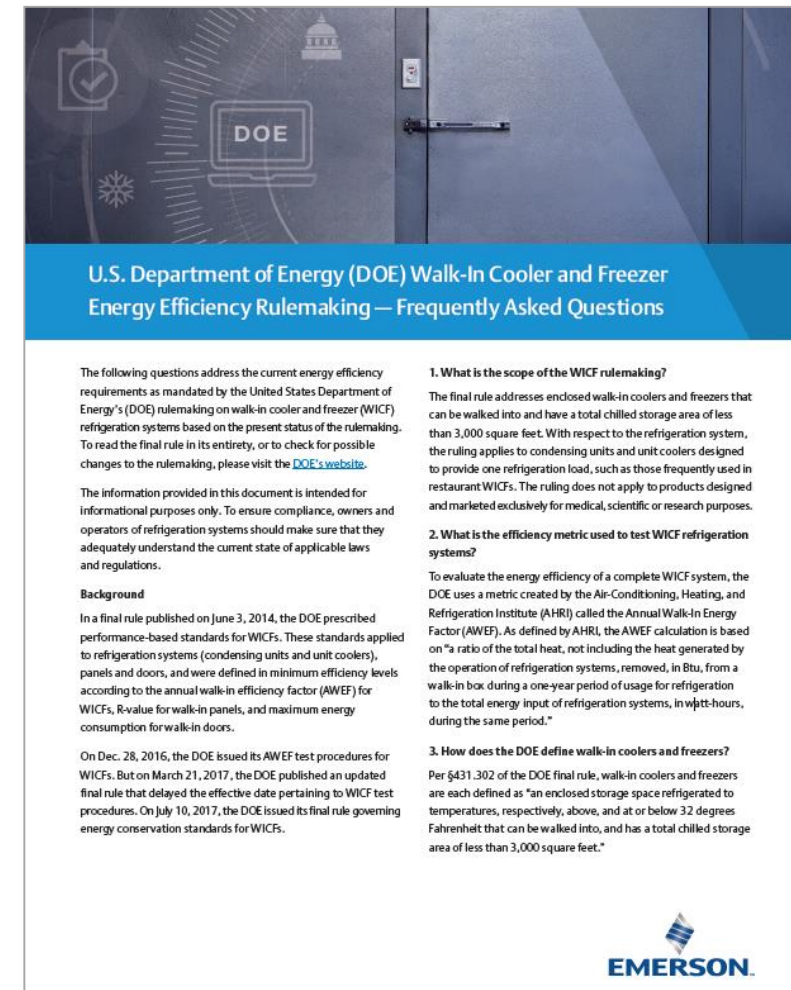
Please Contact Us for Additional Assistance.

Additional Resources

E360 Outlook Article



FAQ Document



Climate.Emerson.com/Webinar33

See bottom of webpage for AWEF-related information.

Reference for Ruling

The screenshot shows the U.S. Department of Energy website. At the top left is the logo for the U.S. Department of Energy, Energy Efficiency & Renewable Energy. The main heading is "Appliance and Equipment Standards Rulemakings and Notices". Below this is a breadcrumb trail: "EERE » Building Technologies Office » Appliance & Equipment Standards". On the left is a navigation menu with links for Buildings Home, About, Emerging Technologies, Residential Buildings, Commercial Buildings, Appliance & Equipment Standards (which is highlighted), and Standards & Test Procedures. The main content area features the title "Walk-In Coolers and Walk-In Freezers" in blue. Below the title is a paragraph defining WICFs according to the Code of Federal Regulations (CFR). To the right of this paragraph is a grey box with a call to action: "Sign up for e-mail updates on regulations for this and other products". Below the main paragraph are several blue links: "Current Standard", "Current Test Procedure", "Ongoing Rulemaking for Standards", "Ongoing Rulemaking for Test Procedure", and "Helpful Links".

U.S. DEPARTMENT OF **ENERGY** | Energy Efficiency & Renewable Energy

Appliance and Equipment Standards Rulemakings and Notices

EERE » Building Technologies Office » Appliance & Equipment Standards

- Buildings Home
- About
- Emerging Technologies
- Residential Buildings
- Commercial Buildings
- Appliance & Equipment Standards**
- Standards & Test Procedures

Walk-In Coolers and Walk-In Freezers

As defined in the Code of Federal Regulations (CFR), “walk-in cooler” and “walk-in freezer” (WICFs) mean 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. The terms “walk-in cooler” and “walk-in freezer” do not include products designed and marketed exclusively for medical, scientific, or research purposes. [10 CFR 431, Subpart R](#). Manufacturers have been required to comply with the U.S. Department of Energy (DOE) energy conservation standards for WICFs since 2009.

[Current Standard](#) | [Current Test Procedure](#) | [Ongoing Rulemaking for Standards](#) | [Ongoing Rulemaking for Test Procedure](#) | [Helpful Links](#)

Sign up for e-mail updates on regulations for this and other products

https://www1.eere.energy.gov/buildings/appliance_standards/standards.aspx?productid=56&action=viewlive [eere.energy.gov]

Standards Can Be Found on DOE Website.

Key Takeaways

1

How this ruling impacts you

2

What you are responsible for doing

3

How Emerson can help



Please Contact Us for Additional Assistance.

Polling Questions

How prepared do you now feel for the DOE walk-in requirements coming in 2020?

- Extremely prepared
- Somewhat prepared
- Not at all prepared

What, if any, additional information are you interested in receiving? (Check all that apply.)

- Training for you and/or your company
- Training for your customers
- Emerson product information
- Other _____
- None of the above

Sources

- https://www1.eere.energy.gov/buildings/appliance_standards/pdfs/manufacturer_faq_2012-01-30.pdf
- https://www1.eere.energy.gov/buildings/appliance_standards/pdfs/wicf_faq_2012-01-20.pdf
- https://www.regulations.doe.gov/certification-data/#q=Product_Group_s%3A*
- <https://www.energy.gov/sites/prod/files/2016/02/f29/Enforcement%20Policy%20Statement%20-%20WICF%2002-01-16.pdf>
- https://www1.eere.energy.gov/guidance/detail_search.aspx?IDQuestion=613&pid=2&spid=1
- <https://www.regulations.gov/document?D=EERE-2015-BT-STD-0016-0075>
- https://www1.eere.energy.gov/buildings/appliance_standards/standards.aspx?productid=56&action=viewlive
- <https://www.federalregister.gov/documents/2017/07/10/2017-14079/energy-conservation-program-energy-conservation-standards-for-walk-in-cooler-and-freezer>
- https://www.ecfr.gov/cgi-bin/text-idx?SID=fb844b4072b6666f2a4aa4b3bb738eb5&mc=true&node=pt10.3.431&rqn=div5#se10.3.431_1306

Question & Answer Panel Discussion



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Roxanne Scott
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