



## U.S. Department of Energy (DOE) Walk-In Cooler and Freezer Energy Efficiency Rulemaking — Frequently Asked Questions

The following questions address the current energy efficiency requirements as mandated by the United States Department of Energy's (DOE) rulemaking on walk-in cooler and freezer (WICF) refrigeration systems based on the present status of the rulemaking. To read the final rule in its entirety, or to check for possible changes to the rulemaking, please visit the [DOE's website](#).

The information provided in this document is intended for informational purposes only. To ensure compliance, owners and operators of refrigeration systems should make sure that they adequately understand the current state of applicable laws and regulations.

### Background

In a final rule published on June 3, 2014, the DOE prescribed performance-based standards for WICFs. These standards applied to refrigeration systems (condensing units and unit coolers), panels and doors, and were defined in minimum efficiency levels according to the annual walk-in efficiency factor (AWEF) for WICFs, R-value for walk-in panels, and maximum energy consumption for walk-in doors.

On Dec. 28, 2016, the DOE issued its AWEF test procedures for WICFs. But on March 21, 2017, the DOE published an updated final rule that delayed the effective date pertaining to WICF test procedures. On July 10, 2017, the DOE issued its final rule governing energy conservation standards for WICFs.

### 1. What is the scope of the WICF rulemaking?

The final rule addresses 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. With respect to the refrigeration system, the ruling applies to condensing units and unit coolers designed to provide one refrigeration load, such as those frequently used in restaurant WICFs. The ruling does not apply to products designed and marketed exclusively for medical, scientific or research purposes.

### 2. What is the efficiency metric used to test WICF refrigeration systems?

To evaluate the energy efficiency of a complete WICF system, the DOE uses a metric created by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) called the Annual Walk-In Energy Factor (AWEF). As defined by AHRI, the 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."

### 3. How does the DOE define walk-in coolers and freezers?

Per §431.302 of the DOE final rule, walk-in coolers and freezers are each defined 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."

#### 4. What are the enforcement dates of the DOE WICF ruling?

Enforcement is based on the date of manufacture and the condensing unit temperature:

- Jan. 1, 2020: WICFs with medium-temperature dedicated condensing systems
- July 10, 2020: WICFs with low-temperature dedicated condensing systems

It's important to note that although a 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 Jan. 1, 2020.

#### 5. Who is directly impacted by the DOE WICF ruling?

The DOE's WICF ruling directly applies to anyone manufacturing, producing, assembling or importing to certify WICF components. Directly impacted parties must meet the applicable standards based on the date of manufacture. Other parties who could be potentially impacted by this ruling include: contractors, wholesalers, design consultants and end users of these products.

#### 6. Does the DOE WICF regulation impact new and/or replacement (retrofit) equipment?

The DOE WICF ruling affects all WICF equipment or components manufactured on or after the applicable enforcement date — for both new and retrofit applications.

It's important to note that contractors and wholesalers can still use and stock condensing units that were manufactured before the DOE enforcement dates. However, all WICF components manufactured after the enforcement dates must be compliant.

#### 7. How does the DOE rule impact WICF refrigeration system (or condensing units)?

From a refrigeration system standpoint, certified WICF components refer to dedicated and packaged condensing units (indoor and outdoor) used in both new and retrofit applications, including:

- 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

#### 8. How does the DOE define condensing units used in WICFs?

According to the final rule, a dedicated condensing unit is defined as a positive displacement condensing unit that is part of a refrigeration system and is based on one of the following assemblies:

- 1) Includes one or more compressors, a condenser and one refrigeration circuit
- 2) Is designed to serve one refrigerated load

In addition, a dedicated condensing refrigeration system refers to one of the following:

- 1) A dedicated condensing unit
- 2) A single-package dedicated system
- 3) A matched refrigeration system

#### 9. Which WICF refrigeration equipment/applications are not addressed in the above-mentioned DOE WICF final rule?

The DOE WICF final rule is not intended to apply to the following equipment:

- 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 WICF



## 10. What are the minimum AWEF requirements as set forth in the DOE WICF final rule?

Per the DOE, there are several WICF equipment classes below the 3,000 square foot limit that must meet or exceed the minimum AWEF ratings based on capacity and application (e.g., medium- or low-temperature, indoor or outdoor). The following table details the minimum AWEF rating per equipment class.

Minimum AWEF rating per equipment class	
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.

## 11. How do equipment manufacturers verify DOE WICF compliance?

There are three ways in which WICF manufacturers demonstrate certification and compliance with the DOE AWEF efficiency standards.

**A. Database registration** — Manufacturers must submit an annual certification report for any affected products/ equipment subject to an applicable energy conservation standard. The information submitted to the DOE is made publicly available via the Compliance Certification Management System (CCMS) database, which is managed by the DOE Appliance Standards Program. This database can be found here: [https://www.regulations.doe.gov/certification-data/#q=Product\\_Group\\_s%3A\\*](https://www.regulations.doe.gov/certification-data/#q=Product_Group_s%3A*)

**B. Marketing materials 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 components.

**C. Permanent nameplate marking** — Manufacturers of AWEF-compliant WICF equipment and components must place a permanent mark on their refrigeration systems' nameplates. For example, if the refrigeration system is a dedicated condensing refrigeration system not designated for outdoor use, the words "Indoor use only" and one of the following appropriate statements should be used:

- "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."

These compliance statements are based on the DOE's definition of a "walk-in cooler" and "walk-in freezer" (WICFs) as an enclosed storage space refrigerated to temperatures, respectively, above, and at or below 32 degrees Fahrenheit.



## 12. Other than WICF equipment and component manufacturers, how does the DOE ruling impact other commercial refrigeration stakeholders?

The DOE's WICF ruling will have broad impacts throughout the industry, from OEMs and wholesalers to contractors and end users. Because the DOE WICF ruling impacts both new and retrofit equipment, every segment of the commercial refrigeration supply chain will need to understand its implications. Here's what you need to know:

- **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.
- **Wholesalers** — must be prepared for changing inventories and begin to carry only AWEF-compliant condensing units if they're manufactured after the 2020 enforcement dates for WICF applications
- **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

## 13. How does the DOE WICF rule apply to products to be exported outside the United States?

The rule does not apply to products that are manufactured, sold or held for sale if they are being exported from the United States, or imported for export. The product/equipment or any container in which it is enclosed, when distributed in commerce, must bear a stamp or label stating "NOT FOR SALE FOR USE IN THE UNITED STATES". When labeled as such, the product cannot be distributed in commerce for use in the United States.

Products exported to Canada and Mexico have their own standards for WICF, although Mexico's standard is currently in draft form. For more information, refer to Natural Resources Canada (NRCAN) and Mexico's Energy Ministry in their Federal Official Gazette per standard PROY-NOM-012-ENER-2017. Other countries have additional applicable regulatory standards for WICFs as well.

Sources:

[https://www1.eere.energy.gov/buildings/appliance\\_standards/standards.aspx?productid=56&action=viewlive](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&rgn=div5#se10.3.431\\_1306](https://www.ecfr.gov/cgi-bin/text-idx?SID=fb844b4072b6666f2a4aa4b3bb738eb5&mc=true&node=pt10.3.431&rgn=div5#se10.3.431_1306)

## 14. Does the DOE WICF regulation specify the kind of refrigerant that should be used to achieve compliance?

While the standards do not dictate the type of refrigerants used, the AWEF rating will vary based on the characteristics of the refrigerant. Emerson will publish applicable AWEF scores for approved refrigerants for WICF products; this information can also be found in the CCMS database.

## 15. Other than condensing units and unit coolers, what other components are impacted by the DOE WICF final rule?

For OEMs of new equipment, the DOE's WICF ruling also applies to components that comprise the entire refrigeration system envelope. This includes the following components and/or special requirements:

- Automatic door closers
- Methods of minimizing infiltration when doors are open
- Insulation for floors, walls, ceilings and doors
- Evaporator fan motors less than 1 horsepower and less than 460 V must be ECM or three-phase
- Condenser fan motors less than 1 horsepower must be ECM, PSC or three-phase
- Interior lighting lumens per watt requirements
- Transparent glass doors and windows require double- or triple-pane glass with heat-reflective treated glass or glass fill
- Minimum amp draw requirements for antisweat heaters with controls
- Display, passage, freight and non-display doors have maximum energy consumption per day
- U factors of display panels

For answers to your specific questions about DOE WICF rulemaking, please contact your Emerson sales representative or application engineer. Visit [Climate.Emerson.com/FAQs-AWEF](https://Climate.Emerson.com/FAQs-AWEF) for more information about regulations impacting commercial refrigeration.