

# Federal Requirements for Air Compressors

Federally-regulated compressors manufactured on or after January 10, 2025, must meet U.S. Department of Energy (DOE) standards as well as certification requirements in [California's Appliance Efficiency Regulations \(Title 20\)](#). These regulations set minimum efficiency requirements for large, lubricated, rotary air compressors. Regulated products must be certified to the U.S. DOE [Compliance Certification Management System \(CCMS\)](#). In addition to being certified to the CCMS, if products are to be sold or offered for sale in California, Title 20 requires that federally and state-regulated products be certified to the California Energy Commission (CEC) [Modernized Appliance Efficiency Database System \(MAEDbS\)](#), a publicly-available database that contains all regulated products that may be legally be sold or offered for sale in California.

## What Changed?

In 2020, the U.S. DOE adopted standards for large rotary air compressor which became effective on January 10, 2025. These standards align with the requirements previously effective in California.

Air compressors manufactured on or after January 10, 2025, are federally-regulated and need to be certified to both the CCMS and the MAEDbS.

## Quick Links to Relevant Code Sections

### California Appliance Efficiency Regulations - Title 20

- ✦ [Section 1602\(s\)](#) – Definitions
- ✦ [Section 1604\(s\)](#) – Test Methods for Electric Motors and Compressors
- ✦ [Section 1605.1\(s\)\(7\)](#) - State and Federal Standards for Federally-Regulated Compressors
- ✦ [Section 1606](#) – Filing by Manufacturers; Listing of Appliances in Database
- ✦ [Section 1607](#) – Marking of Appliances
- ✦ [Section 1608](#) – Compliance, Enforcement, and General Administrative Matters



*Digital model of a lubricated rotary air compressor unit displaying internal mechanism*

# Federally-regulated Compressor Criteria

The DOE standards only regulate lubricated, rotary air compressors that:

- ✦ Operate at pressures greater or equal to 75 pounds per square inch gauge (psig) but less than or equal to 200 psig
- ✦ Are driven with a brushless electric motor
- ✦ Have a full-load actual volume flow rate greater than or equal to 35 cubic feet per minute (cfm) or are sold with a compressor motor nominal horsepower greater than or equal to 10 horsepower (hp)
- ✦ Have a full-load actual volume flow rate less than or equal to 1,250 cfm or sold with a compressor motor nominal horsepower less than or equal to 200 hp
- ✦ Are not designed and tested to the requirements of the American Petroleum Institute Standard 619, "Rotary-Type Positive-Displacement Compressors for Petroleum, Petrochemical, and Natural Gas Industries"
- ✦ Are manufactured alone or as a component of another piece of equipment;
- ✦ Are driven by a 3-phase electric motor, **and**
- ✦ Are one of the equipment classes in Table S-5, below.

## Performance Requirements

Federally-regulated compressors manufactured on or after January 10, 2025, must meet the applicable performance values in [Table S-5](#):

**Table S-5: Standards for Federally-regulated Compressors**

Equipment Class	Minimum Package Isentropic Efficiency <sup>1</sup>	$\eta_{Regr}$ (Package Isentropic Efficiency Reference Curve)	d (Percentage Loss Reduction)
Rotary, lubricated, air-cooled, fixed-speed compressor	$\eta_{Regr} + (1 - \eta_{Regr}) * (d/100)$	$-0.00928 * \ln^2(.4719 * V_1) + 0.13911 * \ln(.4719 * V_1) + 0.27110$	-15
Rotary, lubricated, air-cooled, variable-speed compressor	$\eta_{Regr} + (1 - \eta_{Regr}) * (d/100)$	$-0.01549 * \ln^2(.4719 * V_1) + 0.21573 * \ln(.4719 * V_1) + 0.00905$	-10
Rotary, lubricated, liquid-cooled, fixed-speed compressor	$.02349 \eta_{Regr} + (1 - \eta_{Regr}) * (d/100)$	$-0.00928 * \ln^2(.4719 * V_1) + 0.13911 * \ln(.4719 * V_1) + 0.27110$	-15
Rotary, lubricated, liquid-cooled, variable-speed compressor	$.02349 \eta_{Regr} + (1 - \eta_{Regr}) * (d/100)$	$-0.01549 * \ln^2(.4719 * V_1) + 0.21573 * \ln(.4719 * V_1) + 0.00905$	-15

Where  $V_1$  is the full-load actual volume flow rate of the compressor, in cubic feet per minute, as determined in accordance with the test procedure in [Section 1604\(s\)](#)

<sup>1</sup>For "fixed-speed compressor" equipment classes, the relevant Package Isentropic Efficiency is Full-load Package Isentropic Efficiency. For "Variable-speed compressor" equipment classes, the relevant Package Isentropic Efficiency is Part-load Package Isentropic Efficiency. Both Full- and Part- Load Package Isentropic Efficiency are determined in accordance with the test procedure in [Section 1604\(s\)](#) of this Article.

# Testing Requirements

Federally-regulated compressors must be listed in the CCMS and the MAEDbS prior to being sold or offered for sale in California. Manufacturers must test their compressors using the federal test procedure and provide test results documenting compliance with the standards. Manufacturers have two primary methods to test their products:

1. The DOE test [procedure](#) for lubricated, large rotary air compressors that is aligned with industry test procedure ISO 1217:2009: If historical test data is consistent with values that are generated when testing with the DOE test procedure, manufacturers may submit historical test data for the purposes of demonstrating compliance.
2. The “alternative efficiency determination method” (AEDM): This is a mathematical model of the compressor package that allows calculation of the package isentropic efficiency, package specific power, pressure ratio at full-load operating pressure, full-load actual volume flow rate or full-load operating pressure without actually assembling the compressor package and testing it.

## FAQs

### If products were tested prior to the standards taking effect but according to the DOE test procedure, do they need to be re-tested?

No. Manufacturers can use results from previously conducted tests as long as they were performed according to the appropriate procedure and in a test lab that has conducted the test in the previous 12 months ([Section 1603\(a\)](#)).

### Where can I find the appropriate test procedure?

The DOE procedure can be found in 10 Code of Federal Regulations (CFR) [Appendix A](#) to subpart T of Part 431. [Title 20, Section 1604\(s\)](#) incorporates the DOE test procedure by reference.

### If my product is already certified to the MAEDbS, does it need to be re-certified?

Products manufactured between January 1, 2022 and January 9, 2025, do not need to be re-certified to the MAEDbS. Products manufactured on and after January 10, 2025, need to be certified to both the DOE's CCMS and the MAEDbS as a federally-regulated product.

### How to Comply

Compliance entails the following:

- ✦ Meeting the applicable design or performance standards (efficiency standards)
- ✦ Testing regulated products by using the required test method by a CEC-approved test lab
- ✦ Marking the regulated product in accordance with Title 20, [Section 1607](#)
- ✦ Certifying the product to DOE's CCMS and to the CEC's MAEDbS

Everyone in the sales chain – including manufacturers, distributors, retailers, contractors, and importers – is responsible for ensuring regulated products are listed in the MAEDbS. To learn more about the MAEDbS and how to use it, view the Energy Code Ace Title 20 On-Demand Video [Training](#).

For questions about certifying to the MAEDbS, please email [appliances@energy.ca.gov](mailto:appliances@energy.ca.gov) or call the Energy Commission Appliances Hotline at (888) 838-1467 or (916) 651-7100.



## For More Information



**CALIFORNIA  
ENERGY COMMISSION**

[energy.ca.gov](http://energy.ca.gov)

- ✦ **Appliances Call Center:** (888) 838-1467 or outside California (916) 651-7100. Questions may also be emailed to [appliances@energy.ca.gov](mailto:appliances@energy.ca.gov)
- ✦ [California Appliance Efficiency Standards Site](#)
- ✦ [Modernized Appliance Efficiency Database \(MAEDbs\)](#)

## U.S. Department of Energy

- ✦ [Office of Energy Efficiency & Renewable Energy Appliance and Equipment Standards Program](#)
- ✦ [Compliance Certification Management System \(CCMS\)](#)



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