

When Does the Energy Code Apply?

The 2022 Building Energy Efficiency Standards (Energy Code) has requirements for new and altered commercial refrigeration systems in retail food stores. The standards apply to retail food or beverage stores with 8,000 square feet or more of conditioned floor area and have refrigerated display cases, walk-in coolers, or walk-in freezers connected to remote compressor or condensing units.

Requirements for commercial refrigeration systems can be found in Section 120.6(b) of Title 24, Part 6. The requirements for commercial refrigeration systems are mandatory and may not be traded off when using the performance method of compliance.

What Are the Requirements?

Condensers Serving Refrigeration Systems *

Fan-powered condensers shall conform to the following requirements:

- New air-cooled condensers must have a fin density no greater than 10 fins per inch unless it is a microchannel condenser.*
- The refrigeration system condenser controls must use variable-setpoint control logic to reset the condensing temperature setpoint in response to ambient temperature.*
- The saturated condensing temperature necessary for adiabatic condensers to reject the design total heat of rejection of a refrigeration system assuming dry mode performance shall be less than or equal to:
 - >> Design drybulb temperature plus 20°F for systems serving freezers.
 - >> Design drybulb temperature plus 30°F for systems serving coolers.
- The minimum condensing temperature setpoint must be less than or equal to 70°F.
- All condenser fans for air-cooled condensers, evaporative-cooled condensers, air or water-cooled fluid coolers, or cooling towers must be continuously variable speed, with the speed of all fans serving a common condenser high side controlled in unison.

- Fan-powered condensers must meet the specific efficiency requirements listed in TABLE 120.6-D.*

Compressor Systems*

Refrigeration compressor systems and condensing units must conform to the following requirements:

- Compressors and multiple-compressor suction groups must use floating suction pressure logic to reset the target saturated suction temperature based on the temperature requirements of the attached refrigeration display case or walk-ins.*
- Liquid subcooling must be provided for new low-temperature compressor systems with a design cooling capacity greater than or equal to 100,000 Btu/hr and a design saturated suction temperature of -10°F or lower, when liquid subcooling is required, the subcooled liquid temperature must be maintained continuously at 50°F or less at the exit of the subcooler using compressor economizer port(s) or a separate suction group operating at a saturated suction temperature of 18°F or higher.*
- Compressors for transcritical CO₂ refrigeration systems shall be designed to operate at a minimum condensing temperature of 60°F or less.*

Refrigerated Display Cases

Lighting in refrigerated display cases and lights on glass doors installed on walk-in coolers and freezers shall be controlled by one of the following:

- Automatic time-switch controls that turn off lights during nonbusiness hours. Timed overrides may be used to turn the lights on for up to one hour. Manual overrides must time-out automatically to turn the lights off after one hour.
- Motion sensor controls on each case that reduce display case lighting power by at least 50 percent within 30 minutes after the area near the case is vacated.

Refrigeration Heat Recovery

- The recovered heat must be 25 percent or more of the sum of the design total heat of rejection of all refrigeration systems that have individual total heat of rejection values of 150,000 Btu/h or greater at design conditions.*
- The increase in hydrofluorocarbon refrigerant charge associated with refrigeration heat recovery equipment and piping must not exceed 0.35 lbs per 1,000 Btu/h of heat recovery heating capacity.

Transcritical CO₂ Gas Coolers

New fan-powered gas coolers on all new transcritical CO₂ refrigeration systems shall conform to the following:

- Air-cooled gas coolers are prohibited in Climate Zones 10 through 15.
- Design leaving gas temperature for air-cooled gas coolers shall be less than or equal to the design dry-bulb temperature plus 6°F.
- Design leaving gas temperature for adiabatic gas coolers necessary to reject the design total heat of rejection of a refrigeration system assuming dry mode performance shall be less than or equal to the design dry-bulb temperature plus 15°F.

- All gas cooler fans shall be continuously variable speed, with the speed of all fans serving a common condenser high side controlled in unison.
- While operating below the critical point, the gas cooler pressure shall be controlled in accordance with Section 120.6(b)1A.
- While operating above the critical point, the gas cooler pressure setpoint shall be reset based on ambient conditions such that the system efficiency is maximized.
- The minimum condensing temperature setpoint shall be less than or equal to 60°F for air-cooled gas coolers, evaporative cooled gas coolers, adiabatic gas coolers, air or water-cooled fluid coolers or cooling towers.*
- Fan-powered gas coolers shall meet the gas cooler efficiency requirements listed in Table 120.6-E. Gas cooler efficiency is defined as the Total Heat of Rejection (THR) capacity divided by all electrical input power (fan power at 100 percent fan speed).

Commercial Refrigeration Acceptance

Transcritical CO₂ refrigeration systems shall be tested in accordance with NA7.20.1

*Exceptions may apply. See Section 120.6(b) in the Energy Code for details.



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