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INTRODUCTION

Chapter 9 Introduction

This chapter covers covered process system requirements for all dwelling units and common use areas and requirements for enclosed parking garages in multifamily buildings for newly constructed buildings and additions or alterations to existing buildings.

Guidance on general requirements is included in the Multifamily Compliance Manual Chapter 1: General Requirements. Guidance on administrative requirements is included in the Multifamily Compliance Manual Chapter 2: Compliance and Enforcement. This chapter includes guidance on covered process system requirements.

Table 9-1: Excerpt from Table 100.0-A Application of Standards provides an overview of the location of the covered process requirements and enclosed parking garage requirements that apply to multifamily occupancies in the Energy Code.

Table 9-1: Excerpt from Table 100.0-A Application of Standards

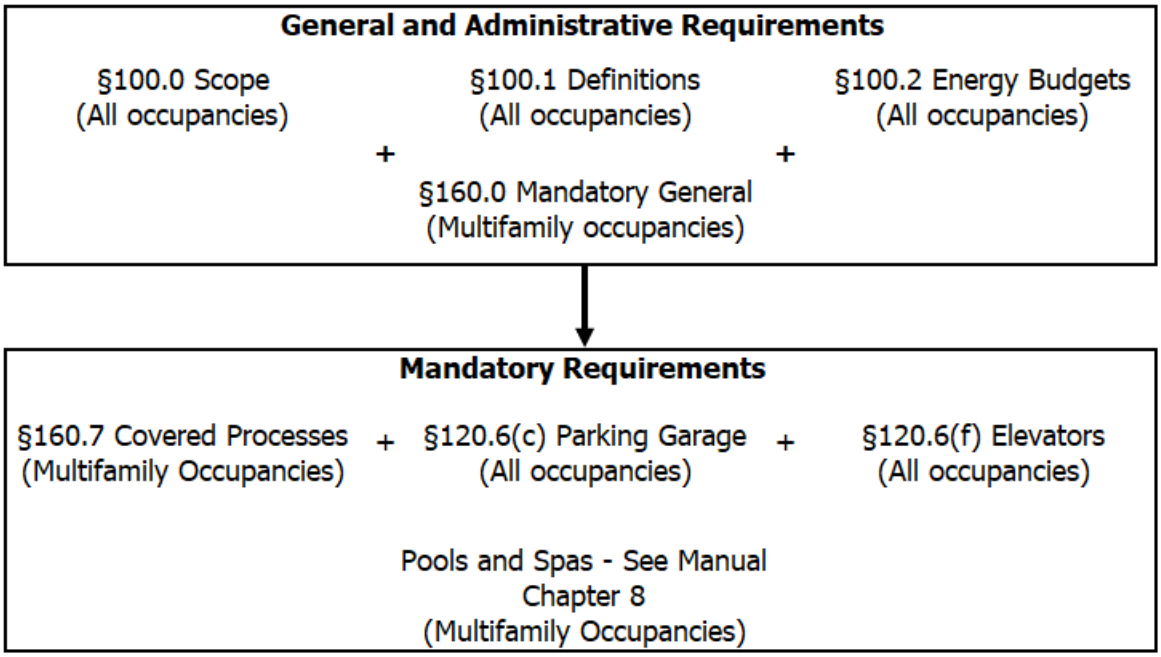
Application	Mandatory	Prescriptive	Performance	Additions/ Alterations
General[1]	160.0	N/A	N/A	180.0
Covered Process and Enclosed Parking Garage	160.7, 120.6(c), 120.6(f) Pools and Spas – See Chapter 8	N/A	N/A	See Mandatory Requirements

1. Guidance on General Requirements from Sections 160.0 and 180.0 are included in the Multifamily Compliance Manual Chapter 1 General Requirements. Guidance specific to multifamily covered processes is included in this chapter.

Source: California Energy Commission

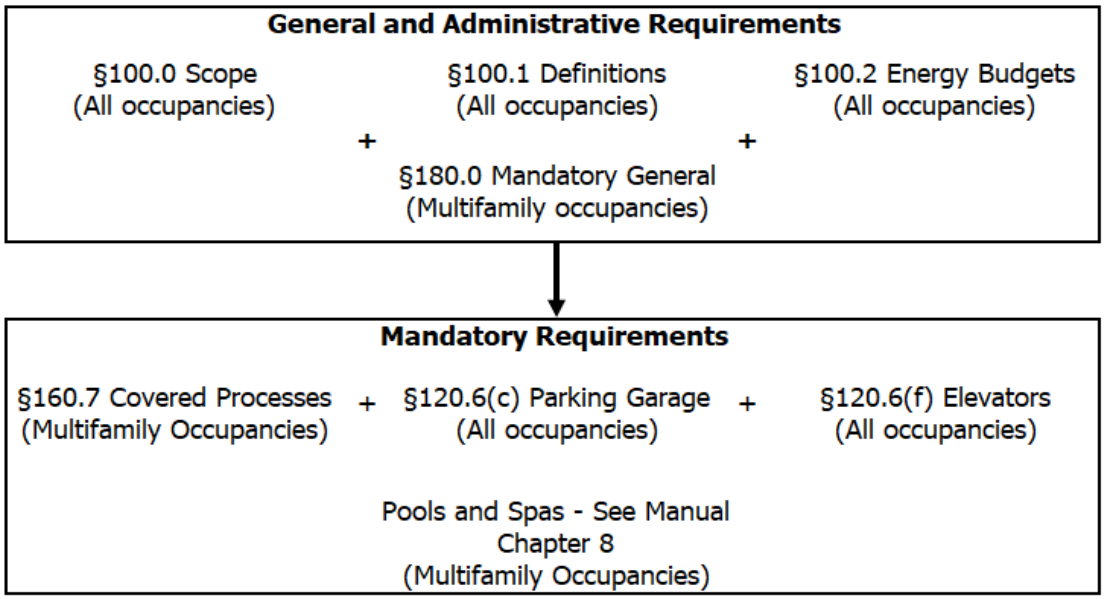
Figure 9-1: Flowchart Guidance for Application of New Construction Multifamily Covered Process and Enclosed Parking Garage Requirements and Figure 9-2: Flowchart Guidance for Application of Addition or Alteration Multifamily Covered Process and Enclosed Parking Garage Requirements below illustrate the applicable sections for newly constructed buildings and additions or alterations to existing buildings.

Figure 9-1: Flowchart Guidance for Application of New Construction Multifamily Covered Process and Enclosed Parking Garage Requirements



Source: California Energy Commission

Figure 9-2: Flowchart Guidance for Application of Addition or Alteration Multifamily Covered Process and Enclosed Parking Garage Requirements



Addition, Alteration Compliance Approaches

Source: California Energy Commission

SECTION 160.7 – MANDATORY REQUIREMENTS FOR COVERED PROCESSES

(a) Elevators. Elevators shall meet the requirements of Section 120.6(f).

«» Commentary for Section 160.7(a):

Per Section 160.7(a), Section 120.6(f) applies to all elevators in multifamily new construction, as well as existing elevators undergoing major alterations involving mechanical equipment, lighting, and/or controls. The requirement reduces light power density of the elevator cab lighting and requires a minimum wattage per cfm for ventilation fans in cabs without air conditioning. Both the lighting and ventilation fans are to be controlled in such a way to shut off when the elevator has been unoccupied for an extended period. Please refer to the sections below for more information on specific requirements for elevators. **«»**

NOTE: Authority: Sections 25213, 25218, 25218.5, 25402 and 25402.1, Public Resources Code. Reference: Sections 25007, 25008, 25218.5, 25310, 25402, 25402.1, 25402.4, 25402.5, 25402.8 and 25943, Public Resources Code.

SECTION 120.6 – MANDATORY REQUIREMENTS FOR COVERED PROCESSES

Nonresidential and hotel/motel buildings shall comply with the applicable requirements of Sections 120.6(a) through 120.6(k), and the applicable requirements of Sections 110.2(a) and 120.3.

«» Commentary for Section 120.6:

Relevant covered processes in multifamily buildings, including enclosed parking garages and elevators, must comply with applicable requirements in the nonresidential covered processes sections, as outlined below. Additions and alterations to covered processes in multifamily buildings must also comply with applicable requirements in Section 120.6. Elevator additions, alterations and repairs are defined as follows:

1. An elevator installation is considered an addition when the location of the installation did not previously contain an elevator.
2. An alteration is a change to an existing elevator system that is not an addition or repair. An alteration could include installing new controls or a new lighting system.
3. A repair is the reconstruction or renewal of any part of an existing elevator system for its maintenance, for example, the replacement of lights or cosmetic features.
4. Any addition or altered space must meet all applicable mandatory requirements. Repairs must not increase the preexisting energy consumption of the repaired component, system, or equipment; otherwise, it is considered an alteration. «»

(c) Mandatory requirements for enclosed parking garages. Enclosed Parking Garages. Mechanical ventilation systems for enclosed parking garages where the total design exhaust rate for the garage is greater than or equal to 10,000 cfm shall conform to all of the following:

1. Automatically detect contaminant levels and stage fans or modulate fan airflow rates to 50 percent or less of design capacity, provided acceptable contaminant levels are maintained.
2. Have controls and/or devices that will result in fan motor demand of no more than 30 percent of design wattage at 50 percent of design airflow.

«» Commentary for Section 120.6(c)2:

This mechanical ventilation requirement can be achieved by either a two-speed motor or a variable-speed drive. «»

3. CO shall be monitored with at least one sensor per 5,000 square feet, with the sensor located in the highest expected concentration locations, with at least two sensors per

proximity zone. A proximity zone is defined as an area that is isolated from other areas either by floor or other impenetrable obstruction.

«» Commentary for Section 120.6(c)3:

The typical design for garage exhaust is to have the exhaust fans located on the other side of the parking areas from the source of makeup air. The ventilation air moves across the parking areas and toward the exhaust fans. Good practice is to locate sensors close to the exhaust registers or in dead zones where air is not between the supply and exhaust. Floors and rooms separated by walls should be treated as separate proximity zones. **«»**

4. CO concentration at all sensors is maintained at ≤ 25 ppm or less at all times.
5. The ventilation rate shall be at least 0.15 cfm/ft^2 when the garage is scheduled to be occupied.
6. The system shall maintain the garage at negative or neutral pressure relative to other occupiable spaces when the garage is scheduled to be occupied.
7. CO sensors shall be:
   A. Certified by the manufacturer to be accurate within plus or minus 5 percent of measurement.
   B. Factory calibrated.
   C. Certified by the manufacturer to drift no more than 5 percent per year.
   D. Certified by the manufacturer to require calibration no more frequently than once a year.
   E. Monitored by a control system. The system shall have logic that automatically checks for sensor failure by the following means. Upon detection of a failure, the system shall reset to design ventilation rates and transmit an alarm to the facility operators.
      i. If any sensor has not been calibrated according to the manufacturer's recommendations within the specified calibration period, the sensor has failed.
      ii. During unoccupied periods the system compares the readings of all sensors, e.g., if any sensor is more than 15 ppm above or below the average of all sensors for longer than four hours, the sensor has failed.
      iii. During occupied periods the system compares the readings of sensors in the same proximity zone, e.g., if the 30 minute rolling average for any sensor in a proximity zone is more than 15 ppm above or below the 30 minute rolling average for other sensor(s) in that proximity zone, the sensor has failed.
8. **Parking garage ventilation system acceptance.** Before an occupancy permit is granted for a parking garage system subject to Section 120.6(c), the following equipment and systems shall be certified as meeting the acceptance requirements for code compliance,

as specified by the Reference Nonresidential Appendix NA7. A certificate of acceptance shall be submitted to the enforcement agency that certifies that the equipment and systems meet the acceptance requirements specified in NA7.12.

Exception 1 to Section 120.6(c): Any garage, or portion of a garage, where more than 20 percent of the vehicles expected to be stored have non-gasoline combustion engines.

Exception 2 to Section 120.6(c): Additions and alterations to existing garages where less than 10,000 cfm of new exhaust capacity is being added.

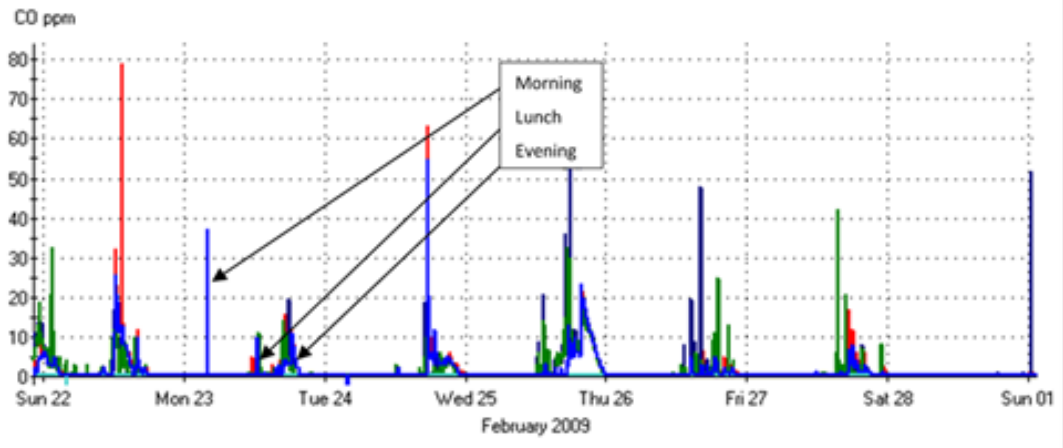
«» Commentary for Section 120.6(c)8:

Garage exhaust systems are sized to dilute the auto exhaust at peak conditions to an acceptable concentration for human health and safety. Energy management control system (EMCS) monitoring of garage carbon monoxide (CO) concentrations show that in a typical enclosed garage, there are three periods of concern:

1. In the morning when cars enter the garage
2. During the lunch break when cars leave and reenter
3. At the end of the day when cars leave

This mandatory measure requires modulating ventilation airflow in large, enclosed parking garages based on pollutant concentrations. By modulating airflow based on need rather than running constant volume, the system will save energy and maintain a safe environment.

Figure 9-3: Garage CO Trends



Source: California Energy Commission

«»

(f) Mandatory requirements for elevators. Elevators shall meet the following requirements:

1. The light power density for the luminaires inside the elevator cab shall be no greater than 0.6 watts per square foot.

Exception to Section 120.6(f)1: Interior signal lighting and interior display lighting are not included in the calculation of lighting power density.

«» Commentary for Section 120.6(f)1:

This light power density is determined by taking the total wattage of the elevator lighting and dividing by the floor area of the elevator in square feet. Interior signal lighting and interior display lighting are not included in the total wattage of the elevator lighting. «»

2. Elevator cab ventilation fans for cabs without space conditioning shall not exceed 0.33 watts per cfm as measured at maximum speed.

«» Commentary for Section 120.6(f)2:

Elevator cabs with space conditioning are excluded from this requirement. «»

3. When the elevator cab is stopped and unoccupied with doors closed for over 15 minutes, the cab interior lighting and ventilation fans shall be switched off until elevator cab operation resumes.

«» Commentary for Section 120.6(f)3:

This requirement can be accomplished with an occupancy sensor or through integrated elevator controls. «»

4. Lighting and ventilation shall remain operational in the event that the elevator cabin gets stuck when passengers are in the cabin.

5. Elevator Lighting and Ventilation Control Acceptance. Before an occupancy permit is granted for elevators subject to 120.6(f), the following equipment and systems shall be certified as meeting the Acceptance Requirement for Code Compliance, as specified by the Reference Nonresidential Appendix NA7. A Certificate of Acceptance shall be submitted to the enforcement agency that certifies that the equipment and systems meet the acceptance requirements specified in NA7.14.

«» Commentary for Section 120.6(f)4-5:

Elevator lighting and ventilation controls must be tested according to NA7.14 to verify that shut off controls installed in an elevator cab turn lighting and ventilation fans off when the elevator is not occupied for more than 15 minutes, and on when elevator cab operation resumes.

The control system must be able to detect occupancy, and keep the lighting and ventilation fan on, in the event that someone is occupying the elevator cabin and the elevator conveyance or doors malfunction. «»

Exception to Section 120.6(f): Elevators located in healthcare facilities.