

Nonresidential, High-Rise Residential, Hotel/Motel Occupancies, and Covered Processes Mandatory Requirements



Subchapter 3

Subchapter 3 identifies mandatory requirements that are applicable to all buildings regulated by the Energy Code except low-rise residential buildings. This includes high-rise residential, nonresidential, hotel/motel buildings, and covered processes. This subchapter spans from Section 120.0 through 120.9. These sections establish mandatory requirements for the design, installation, and insulation of building envelopes, mechanical ventilation and space conditioning, and service water heating systems for these buildings. It also identifies mandatory acceptance testing requirements for mechanical systems, commissioning requirements for newly constructed nonresidential buildings, and requirements for covered processes. ■

120.1

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120.3(a)

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120.3(b)

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120.4(a)

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120.5

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120.5(a)18

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120.6

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120.6(a)

Mandatory Requirements for Refrigerated Warehouses

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120.6(b)

Mandatory Requirements for Commercial Refrigeration¹

120.6(e)

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120.6(f)

Mandatory Requirements for Elevators

120.7

Mandatory Insulation Requirements

120.7(b)

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120.8

Nonresidential Building Commissioning



120.1

Requirements for Ventilation and Indoor Air Quality

CHANGE TYPE: Modification

CHANGE SUMMARY: New indoor air quality requirements in the 2019 Energy Code apply to high-rise residential, hotel motel, and nonresidential buildings.

2019 CODE:

SECTION 120.1 – REQUIREMENTS FOR VENTILATION AND INDOOR AIR QUALITY

~~Nonresidential, high-rise residential, and hotel/motel buildings shall comply with the requirements of Section 120.1(a) through 120.1(e).~~

(a) **General Requirements.**

1. ~~All occupiable spaces in high-rise residential buildings, hotel/motel buildings, and nonresidential buildings other than health-care facilities shall comply with the applicable requirements of Section 120.1(a) through 120.1(g). Healthcare facilities shall be ventilated in accordance with Chapter 4 of the *California Mechanical Code*.~~

~~All enclosed spaces in a building shall be ventilated in accordance with the requirements of this section and the *California Building Code*.~~

~~**EXCEPTION to Section 120.1(a)1:** Refrigerated warehouses and other spaces or buildings that are not normally used for human occupancy and work.~~

2. ~~The required outdoor air-ventilation rate and the air-distribution system design assumptions made in the design of the ventilating system shall be clearly identified on the plans in accordance with required by Section 10-103 of Title 24, Part 1.~~

CHANGE SIGNIFICANCE: The title of Section 120.1 has been updated to reflect new requirements for indoor air quality (IAQ). The change describes the contents of this extensive revision. It also aligns with the titles of ASHRAE 62.1 and ASHRAE 62.2, where most of the ventilation and IAQ requirements come from.

The additional language in Section 120.1(a)1 clarifies the section's scope. Healthcare facilities are now covered by the Energy Code but have different ventilation requirements than the other covered occupancies. This change is necessary to inform users of the Energy Code that the ventilation rate requirements for healthcare facilities are found in the *California Mechanical Code*, not in the Energy Code.

STATE OF CALIFORNIA

Mechanical Systems

NRCC-MCH-E (Created 7/20)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE NRCC-MCH-E

This document is used to demonstrate compliance for mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.4, or §141.0(b)2 for alterations.

Project Name:	Report Page:	Page 1 of 8
Project Address:	Date Prepared:	

A. GENERAL INFORMATION ?

01 Project Location (city)	04 Total Conditioned Floor Area	
02 Climate Zone	05 Total Unconditioned Floor Area	
03 Occupancy Types Within Project:	06 # of Stories (Habitable Above Grade)	
<input type="checkbox"/> Office (B) <input type="checkbox"/> Retail (M) <input type="checkbox"/> Non-refrigerated Warehouse (S) <input type="checkbox"/> Hotel/ Motel Guest Rooms (R-1) <input type="checkbox"/> School (E) <input type="checkbox"/> Healthcare Facility (I) <input type="checkbox"/> High-Rise Residential (R-2/R-3) <input type="checkbox"/> Relocatable Class Bldg (E) <input type="checkbox"/> Other (Write In):		

¹ FOOTNOTES: Climate zone can be determined on the California Energy Commission's website at http://www.energy.ca.gov/maps/renewable/building_climate_zones.html

B. PROJECT SCOPE ?

Table Instructions: Include any mechanical systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in §140.4, or §141.0(b)2 for alterations.

My project consists of (check all that apply)		
01	02	03
Air System(s)	Wet System Components	Dry System Components
<input type="checkbox"/> Heating Air System	<input type="checkbox"/> Water Economizer	<input type="checkbox"/> Air Economizer
<input type="checkbox"/> Cooling Air System	<input type="checkbox"/> Pumps	<input type="checkbox"/> Electric Resistance Heat
Mechanical Controls	<input type="checkbox"/> Hydronic System Piping	<input type="checkbox"/> Fan Systems
<input type="checkbox"/> Mechanical Controls (existing to remain, altered or new)	<input type="checkbox"/> Cooling Towers	<input type="checkbox"/> Ductwork (existing to remain, altered or new)
	<input type="checkbox"/> Chillers	<input type="checkbox"/> Ventilation
	<input type="checkbox"/> Boilers	<input type="checkbox"/> Zonal Systems/ Terminal Boxes

C. COMPLIANCE RESULTS ?

Table Instructions: If any cell on this table says "DOES NOT COMPLY" or "COMPLIES with Exceptional Conditions" refer to Table D. for guidance.

01	AND	02	AND	03	AND	04	AND	05	AND	06	AND	07	AND	08	09
System Summary §110.1 , §110.2 , §140.4		Pumps §140.4(k)		Fans/ Economizers §140.4(c) , §140.4(e)		System Controls §110.2 , §120.2 , §140.4(f)		Ventilation §120.1		Terminal Box Controls §140.4(d)		Distribution Controls §120.3 , §140.4(l)		Cooling Towers §110.2(e)2	Compliance Results
(See Table F)		(See Table G)		(See Table H)		(See Table I)		(See Table J)		(See Table K)		(See Table L)		(See Table M)	
No								No							DOES NOT COMPLY
Mandatory Measures Compliance (See Table Q for Details)															DOES NOT COMPLY

CA Building Energy Efficiency Standards - 2019 Nonresidential Compliance: <http://www.energy.ca.gov/title24/2019standards/>

July 2020

120.1(b)1

High-rise Residential Buildings, Air Filtration

CHANGE TYPE: Addition

CHANGE SUMMARY: This is a new section that focuses on indoor air quality (IAQ) for high-rise residential buildings and includes filtration system efficiency and ventilation system design requirements.

2019 CODE:

(b) High-rise Residential Buildings.

Attached dwellings units shall comply with the requirements of subsections 1 and 2 below. Occupiable spaces other than attached dwelling units shall comply with the requirements of Section 120.1(c).

1. Air Filtration.

A. System types specified in subsections i, ii, and iii shall be provided with air filters in accordance with Sections 120.1(b)1B through 1D. System types specified in subsection i shall also comply with Section 120.1(b)1E.

- i. Mechanical space conditioning systems that supply air to an occupiable space through ductwork exceeding 10 ft (3 m) in length.
- ii. Mechanical supply-only ventilation systems that provide outside air to an occupiable space.
- iii. The supply side of mechanical balanced ventilation systems, including heat recovery ventilation systems and energy recovery ventilation systems that provide outside air to an occupiable space.

B. System Design and Installation.

- i. The system shall be designed to ensure that all recirculated air or outdoor air supplied to the occupiable space is filtered before passing through any system thermal conditioning components.

EXCEPTION to Section 120.1(b)1Bi: For heat recovery ventilators and energy recovery ventilators the location of the filters required by Section 120.1(b) may be downstream of a system thermal conditioning component, provided the system is equipped with ancillary filtration upstream of the system's thermal conditioning component.

- ii. All systems shall be designed to accommodate the clean-filter pressure drop imposed by the system air filter(s). The design airflow rate, and maximum allowable clean-filter pressure drop at the design airflow rate applicable to each air filter shall be determined and reported on labels according to subsection iv below.

Systems specified in Section 120.1(b)1Ai shall be equipped with air filters that meet either subsection a or b below:

- a. Nominal two-inch minimum depth filter(s) shall be sized by the system designer; or

- b. Nominal one-inch minimum depth filter(s) shall be allowed if the filter(s) are sized according to Equation 120.1-A, based on a maximum face velocity of 150 ft per minute and according to the maximum allowable clean filter pressure drop specified in Section 120.1(b)1Dii

$$A_{\text{face}} = Q_{\text{filter}} / V_{\text{face}} \quad (\text{Equation 120.1-A})$$

Where,

A_{face} = air filter face area, the product of air filter nominal length x nominal width, ft²

Q_{filter} = design airflow rate for the air filter, ft³/min

V_{face} = air filter face velocity ≤ 150, ft/min

- iii. All system air filters shall be located and installed in such a manner as to be accessible for regular service by the system owner.
- iv. All system air filter installation locations shall be labeled to disclose the applicable design airflow rate and the maximum allowable clean-filter pressure drop. The labels shall be permanently affixed to the air filter installation location, readily legible, and visible to a person replacing the air filter.

C. **Air Filter Efficiency.** The system shall be provided with air filter(s) having a designated efficiency equal to or greater than MERV 13 when tested in accordance with ASHRAE Standard 52.2, or a particle size efficiency rating equal to or greater than 50 percent in the 0.30–1.0 μm range and equal to or greater than 85 percent in the 1.0–3.0 μm range, when tested in accordance with AHRI Standard 680.

D. **Air Filter Pressure Drop.** All systems shall be provided with air filter(s) that conform to the applicable maximum allowable clean-filter pressure drop specified by i, ii or iii below, when tested using ASHRAE Standard 52.2, or as rated using AHRI Standard 680, for the applicable design airflow rate(s) for the system air filter(s).

- i. The maximum allowable clean-filter pressure drop determined by the system design for the nominal two inch minimum depth air filter required by Section 120.1(b)1Biia; or
- ii. A maximum of 25 PA (0.1 in. of water) clean-filter pressure drop shall be allowed for a nominal one-inch depth air filter sized according to Section 120.1(b)1Biib; or
- iii. For system specified in 120.1(b)1Aii, and 120.1(b)1Aiii, the maximum allowable clean filter pressure drop determined by the system design.

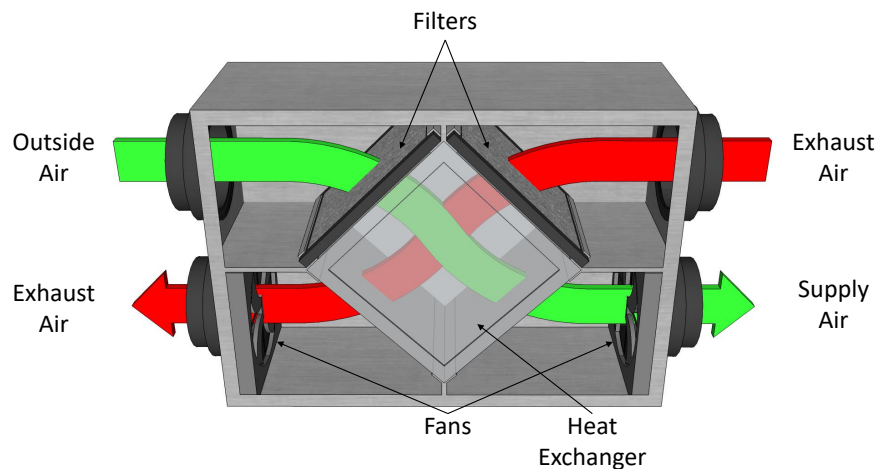
E. **Air Filter Product Labeling.** Systems described in 120.1(b)1Ai shall be equipped with air filters that have been labeled by the manufacturer to disclose the efficiency and pressure drop ratings that demonstrate conformance with Sections 120.1(b)1.

EXCEPTION to Section 120.1(b)1: Evaporative coolers are not subject to the air filtration requirements of Section 120.1(b)1.

CHANGE SIGNIFICANCE: Section 120.1(b)1 improves indoor air quality of high-rise residential dwelling units by increasing the air filtration particle size efficiency requirement in space conditioning systems from MERV 6 to MERV 13. Air filters are now required to be at least 2 inches in depth for improved filter airflow, or 1 inch in depth if 0.1 inch w.c. (25 Pascals) pressure drop and 150 feet per minute filter face velocity are used for the design.

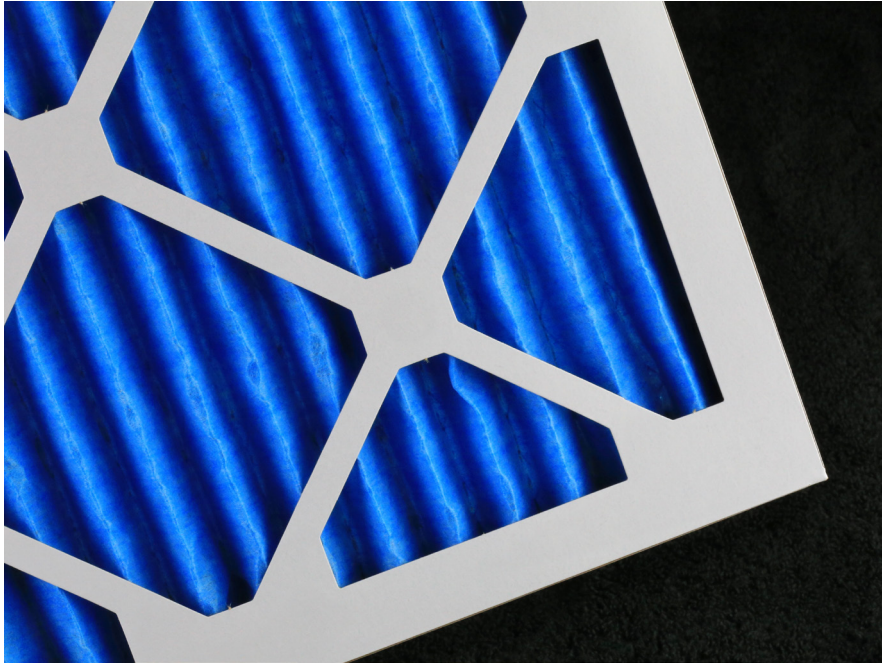
Supply ventilation systems and the supply side of balanced ventilation systems (including heat recovery ventilation and energy recovery ventilation systems) are now required to have MERV 13 air filtration. Ventilation system filters are not required to be two inches and the ventilation system pressure drop may be determined by the designer while maintaining the required ventilation rate delivered to the dwelling unit.

New information about the effects of indoor particulate pollutants was a consideration of new and amended standards for 2019, noting that filters meeting current MERV 6 and MERV 8 requirements are only moderately effective at filtering out airborne particulates (PM10) and are unable to capture or filter out fine particulates (PM2.5). Energy Commission staff identified a MERV rating of 13 as being effective at filtering out fine particulate matter (PM2.5).



Energy Recovery Ventilator – The supply air (green arrow) must pass through a MERV 13 filter.

Source: California Energy Commission



Getty Images

HVAC Filter – MERV 13 Filters are now required for ducted HVAC systems, and on the the supply side of ventilation systems.