

Proposal Summary



Multifamily Compartmentalization and Balanced Ventilation

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Introduction

The document summarizes proposed revisions to the California Energy Code (Title 24, Part 6) that will be discussed during a utility-sponsored stakeholder meeting on February 21, 2023. The Statewide Utility Codes and Standards Enhancement (CASE) Team is seeking input and feedback. To provide your comments, email info@title24stakeholders.com by March 3, 2023.

Measure Description

The 2019 and 2022 version of Title 24 requires multifamily units to comply with either of the following: providing balanced ventilation or meeting a compartmentalization maximum of 0.3 cfm/sf @50 Pa. This proposed measure would add a mandatory measure for all multifamily units to:

- Use supply-only or balanced ventilation as a whole dwelling unit strategy. In other words, use of exhaust-only ventilation could not be used for whole dwelling unit ventilation.
and
- Require a mandatory compartmentalization at a maximum of level of 0.3 cfm/sf @50Pa.

Local exhaust systems should still be used to meet local exhaust requirements, such as in bathrooms, kitchens, and dryers, and exhaust fans could be used as part of a balanced ventilation approach. The proposed requirement would affect all new construction multifamily units.

In addition to these changes to the mandatory requirements, the Statewide CASE Team proposes the following changes to the prescriptive requirements and compliance options to promote energy savings:

- Revising the prescriptive requirement in the 2022 Title 24, Part 6 that requires multifamily dwelling units in Climate Zones 1, 2, and 11-16 that use the balanced ventilation path to include an HRV or ERV. The proposed change is to



prescriptively require all multifamily dwelling units in Climate Zones 1, 2, and 11-16 to use balanced ventilation with an HRV or ERV. Multifamily dwelling units in these climate zones that use a performance path could use supply-only or ventilation without heat recovery, but would need to compensate by exceeding code requirements for another measure.

- Providing a compliance option in the Alternative Calculation Method (ACM) for projects that achieve the tighter compartmentalization value of 0.23 cfm/sf @50Pa.

The primary purpose for the proposed mandatory measure (compartmentalization and balanced / supply-only ventilation) is to promote good indoor air quality (IAQ). Compartmentalization reduces pollutant transfer between units and particle infiltration. A mechanical source of supply air for ventilation is important for IAQ as a unit's envelope is tightened to ensure adequate outdoor air. The two components of the measure also work hand-in-hand. Because compartmentalization tightens a unit's envelope on all sides—with the exterior, and with adjacent spaces (e.g., corridor, adjacent units, trash chutes, etc.), the measure also saves energy by reducing leakage to the exterior, thereby reducing heating and cooling energy. In addition, compartmentalization reduces noise transfer between units and with the exterior.

The prescriptive H/ERV requirement is proposed for energy savings, and is cost effective in the proposed climate zones.

The proposed compliance option for tight sealing down to 0.23 cfm/sf or lower is optional, but allows project teams to claim additional energy savings in the performance path.

The proposal does not make changes for additions or alterations. But since the additions and alterations sections reference the new construction requirements, the Statewide CASE Team proposes revised language so the technical requirements remain the same for additions and alterations.

Data Needs/Stakeholder Information Requests

Data needs may include:

- **Energy Savings** – quantifiable savings (in BTUs, kW, etc.) that can be attributed to each measure.
- **Technical Feasibility** – how well-established the technology or practice is in the industry
- **Market Readiness** – availability in the market, and certainty regarding performance, reliability and cost
- **Non-energy Benefits** – consumer or societal benefits such as improved health and safety, reduced water use, and GHG emission reductions

- **Costs** –
 - Life Cycle Costs
 - First Costs
 - Operational Costs
- **Economic Impacts** – job creation, environment and social justice, equity

Data may be provided anonymously. To participate or provide information, please email Marian Goebes MGoebes@trccompanies.com directly and cc info@title24stakeholders.com.

Draft Code Language

The proposed changes to the Standards and Reference Appendices are provided below. Changes to the 2022 documents are marked with red underlining (new language) and ~~strikethroughs~~ (deletions). Expected sections or tables of the proposed code (but not specific changes at this time) are highlighted in **yellow**.

Section 100.1(b) – Definitions: Recommends revised definitions for the following terms:

VENTILATION SYSTEM, BALANCED is a one or more mechanical device or devices intended to remove air from buildings, and simultaneously replace it with outdoor air.

VENTILATION SYSTEM, EXHAUST is a one or more mechanical device or devices intended to remove air from buildings, causing outdoor air to enter by ventilation inlets or normal leakage paths through the building envelope.

VENTILATION SYSTEM, SUPPLY is a one or more mechanical device or devices intended to bring outdoor air into buildings, causing indoor air to flow out of the building through ventilation relief outlets or normal leakage paths through the building envelope.

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Section 160.2(b)2A.iv

iv. Whole-Dwelling Unit Mechanical Ventilation. Multifamily attached dwelling units shall comply with subsections a, ~~and~~ b, and c below.

- a. Mechanical ventilation airflow shall be provided at rates greater than or equal to the value determined in accordance with Equation 160.2-B.

Total Required Ventilation Rate [ASHRAE 62.2:4.1.1].

$$Q_{tot} = 0.03A_{floor} + 7.5(N_{br} + 1) \quad (\text{Equation 160.2-B})$$

WHERE:

Qtot = total required ventilation rate, cfm

Afloor = dwelling-unit floor area, ft²

Nbr = number of bedrooms (not to be less than 1)

- b. All dwelling units in a multifamily building shall use the same whole-dwelling unit ventilation system type. The system type installed throughout the building shall be only one of the following three types: supply, exhaust, or balanced.
- c. The dwelling unit shall comply with ~~one of the following~~ subsections 1 ~~and~~ ~~or~~ 2 below.
 - 1. Balanced ~~or supply~~ ventilation. A balanced ~~or supply~~ ventilation system shall provide the required whole-dwelling unit ventilation airflow. Systems with heat recovery or energy recovery that serve a single dwelling unit shall have a fan efficacy of ≤ 1.0 W/cfm; ~~and~~ ~~or~~
 - 2. ~~Supply or Exhaust Ventilation with~~ Compartmentalization Testing. ~~Continuously operating supply ventilation systems, or continuously operating exhaust ventilation systems shall be allowed to be used to provide the required whole-dwelling unit ventilation airflow only if t~~ The dwelling unit envelope leakage ~~shall be is~~ less than or equal to 0.3 cubic feet per minute at 50 Pa (0.2 inch water) per ft² of dwelling unit envelope surface area as confirmed by HERS field verification and diagnostic testing in accordance with the procedures specified in Reference Appendix RA3.8 or NA2.3 as applicable.

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Section 170.2(c)3Biv. Prescriptive Requirements

- iv. Balanced Ventilation Systems ~~with Heat Recovery in Climate Zones 1, 2, and 11-16. When~~ A balanced ventilation systems ~~with heat or energy recovery shall be~~ are used to meet Section 160.2(2)Aivb, they ~~and~~ shall meet the applicable requirements of a; ~~or~~ b; ~~or~~ c below.
 - a. In Climate Zones 1, 2, and 11-16, balanced ventilation systems serving individual dwelling units shall:
 - 1. Be an energy recovery ventilator (ERV) or heat recovery ventilator (HRV)
 - 2. Have a minimum sensible recovery efficiency of 67 percent, rated at 32°F (0°C), and
 - 3. Have a fan efficacy less than or equal to 0.6 W per cfm.
 - b. In Climate Zones 1, 2, and 11-16, balanced ventilation systems serving multiple dwelling units in buildings with four or more habitable stories shall:

1. Be an ERV or HRV
2. Have a minimum sensible recovery efficiency or effectiveness of 67 percent, rated at 32°F (0° C),
3. Meet the fan power requirements of Section 170.2(c)4A, and
4. Have recovery bypass or control to directly economize with ventilation air based on outdoor air temperature limits specified in Table 170.2-G.

These measures shall be field verified in accordance with NA7.18.4.

v. ~~e~~. In buildings with three habitable stories or less in Climate Zones 4-10, when a heat pump space conditioning system is installed to meet the requirements of Section 170.2(c)3Ai, balanced ventilation systems without an ERV or HRV shall have a fan efficacy less than or equal to 0.4 W/cfm.

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Section 180.1(a)2. for Additions. [*The following revisions are needed so that the proposed change to the new construction sections do not affect additions.*]

2. **Mechanical ventilation for indoor air quality.** Additions to existing buildings shall comply with Section 160.2 subject to the requirements specified in Subsections A and B below. When HERS field verification and diagnostic testing are required by Section 180.1(a)2, buildings with three habitable stories or less shall use the applicable procedures in the Residential Appendices, and buildings with four or more habitable stories shall use the applicable procedures in Nonresidential Appendices NA1 and NA2.

A. Whole-dwelling unit mechanical ventilation

- i. Dwelling units that meet the conditions in Subsection a or b below shall not be required to comply with the whole-dwelling unit ventilation airflow specified in Section 160.2(b)2Aiv or 160.2(b)2Av
 - a. Additions to an existing dwelling unit that increase the conditioned floor area of the existing dwelling unit by less than or equal to 1000 square feet
 - b. Junior Accessory Dwelling Units (JADU) that are additions to an existing building.
- ii. Additions to an existing dwelling unit that increase conditioned floor area by more than 1,000 square feet shall have mechanical ventilation airflow in accordance with Section 160.2(b)2Aiv or 160.2(b)2Av, as applicable. The mechanical ventilation airflow rate shall be based on the conditioned floor area of the entire dwelling unit comprising the existing dwelling unit

conditioned floor area plus the addition conditioned floor area.

Mechanical ventilation systems in additions may be exhaust, supply, or balanced ventilation systems.

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Section 180.2(b)5 for Alterations [*The following revisions are needed so that the proposed change to the new construction sections do not affect alterations.*]

5. **Mechanical ventilation and indoor air quality for dwelling units.** Alterations to existing buildings shall comply with subsections A and B below as applicable. When HERS field verification and diagnostic testing is required by Section 180.2(b)5, buildings with three habitable stories or less shall use the applicable procedures in the Residential Appendices, and buildings with four or more habitable stories shall use the applicable procedures in Nonresidential Appendices NA1 and NA2.

A. **Entirely new or complete replacement ventilation systems.** Entirely new or complete replacement ventilation systems shall comply with all applicable requirements in Section 160.2(b)2. An entirely new or complete replacement ventilation system includes a new ventilation fan component and an entirely new duct system. An entirely new or complete replacement duct system is constructed of at least 75 percent new duct material, and up to 25 percent may consist of reused parts from the dwelling unit's existing duct system, including but not limited to registers, grilles, boots, air filtration devices and duct material, if the reused parts are accessible and can be sealed to prevent leakage.

Exception: New or replacement ventilation systems in existing dwelling units may be an exhaust, supply, or balanced ventilation system.

B. **Altered ventilation systems.** Altered ventilation system components or newly installed ventilation equipment serving the alteration shall comply with Section 160.2(b)2 as applicable subject to the requirements specified in Subsections i and ii below.

i. **Whole-dwelling unit mechanical ventilation**

a. Whole-dwelling unit strategy. The altered ventilation system may be an exhaust, supply, or balanced ventilation system.

b. **A Whole-dwelling unit airflow.** If the whole-dwelling ventilation fan is altered or replaced, then one of the following Subsections 1 or 2 shall be used for compliance as applicable.

- i. Dwellings that were required by a previous building permit to comply with the whole dwelling unit airflow requirements in Section 160.2(b)2, 120.1(b) or 150.0(o) shall meet or exceed the whole-dwelling unit mechanical ventilation airflow specified in Section 160.2(b)2Aiva or 160.2(b)2Av as confirmed through HERS field verification and diagnostic testing in accordance with the applicable procedures specified in Reference Appendix RA3.7 or NA2.2.

c. ~~b.~~ **Replacement ventilation fans.** *[No changes except to numbering]*

d. ~~c.~~ **Air filters.** *[No changes except to numbering]*

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Section 180.2(c) Performance approach. *[No changes needed. The performance approach refers users to the prescriptive alterations requirements for ventilation.]*

ACM Reference Manual Changes:

[Placeholder for update to ACM for compliance credit, with energy savings for achieving 0.23 cfm50/sf compared to mandatory requirement – 0.3 cfm50/sf. Energy savings depend on climate zone.]

Standards

Reference Appendices