

## DOCKETED

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**Comments on nonresidential IAQ CASE measure**

*Additional submitted attachment is included below.*

To: Statewide Codes and Standards Team  
From: Hwakong Cheng  
Subject: Comments on Title 24 2019 CASE Report, Nonresidential IAQ, Draft Report  
Date: June 23, 2017

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I have reviewed the draft CASE report for Nonresidential IAQ.

**General comments:**

- I have strong hesitations about changing the basis of the ventilation requirements in California to match Standard 62.1. For multiple zone systems, the requirements of 62.1 are very complicated, very poorly understood, and virtually unenforceable. Too much engineering judgment is required. 10 designers instructed to determine Vot for a given design will come up with 10 different values, likely with a large spread. Standard 62.1 may theoretically represent the best science with respect to indoor air quality but that may be moot if the actual implementations are applied inconsistently.
- Much of the language in the CASE report focuses on “aligning” and “harmonizing” the ventilation requirements in California with Standard 62.1 and the ventilation in the rest of the country. But yet this proposal continues to set a different standard for the California building energy efficiency standard. The proposed rates are higher than anywhere else, the occupancy categories have been reorganized, and the body of the ventilation requirements has been reorganized and rephrased. Designers in California would potentially have to comply with 3 ventilation standards, all originally based on Std 62.1: T24 Part 6 (this proposal), T24 Part 4 (CMC, based on Std 62.1), and potentially a different version of Std 62.1 (if pursuing LEED). As proposed, incorporating the 62.1 requirements in Part 6 duplicates much of what already exists in Part 4, but with the great risk of inconsistencies and contradictions because the proposed requirements and language are reorganized. Updates for future code cycles may be further complicated by the modified language and if code update cycles are not aligned.
- The section references in the proposed new language, and in adjacent existing paragraphs need to be reviewed and revised carefully.

**Recommendation:**

Adopt Std 62.1 ventilation to match the ventilation requirements in the rest of the country by referring to the existing requirements in Part 4 (which match 62.1 verbatim), so that there is a single ventilation requirement for projects in California (and remove reference in Part 4 to Part 6 ventilation). If the best science suggests that higher ventilation rates are required, then a continuous maintenance proposal should be brought to ASHRAE SSPC 62.1 so that that standard is updated throughout the nation. Surely, there is no justification for California to need higher ventilation rates than in the other 49 states. That effort may already be underway too. If



62.1 is updated to increase by 30% and T24 Part 6 also keeps the 30% better requirement, then California may eventually end up with 69% better ventilation.

Below are detailed comments on the draft CASE report:

1. Table 2: The values in red parentheses appear to be negative savings, or increases in energy and demand. I think it would be more clear to just use a negative sign, or at least add a note to explain.
2. Section 2.1 Measure Overview: This section says the measure will harmonize with T24 Part 4, but yet the proposed rates are different at 30% higher and the occupancy categories have all been altered as well. The 62.1 language has also been rewritten and reorganized, which creates inconsistencies with the CM and 62.1. This will make it harder to update with future changes to 62.1 and more difficult for engineers to have to review and interpret two ventilation codes that are very similar but slightly different.
3. Section 3.3.4 Impact on Building Owners and Occupants: This generic section says building owners will benefit from lower energy bills. But the actual conclusion of this analysis expects energy bills to increase!
4. Section 7 Proposed Revisions to Code Language: Rather than re-interpret and re-iterate the ventilation requirements in T24 Part 6, I think it would be much cleaner and easier to just eliminate the current requirements in Part 6 and refer instead to the existing language in Part 4. The current proposal is confusing, creates inconsistencies, and will be difficult to maintain. For example:
  - a. 120.1(f)1.: This paragraph requires that zone parameters be determined in accordance with Section 120.1(f), which is the parent paragraph. That doesn't make sense.
  - b. 120.1(f)5. and 120.1(f)6 are confusing as written. 120.1(f)5.B. only provides a single approach to determine  $E_v$  by the simplified lookup table in Table 120.1-C. But 120.1(f)6 provides an alternative parallel path using the multiple spaces equation. 120.1(f)5.B. should be revised to say: "in accordance with TABLE 120.1-C or 120.1(f)6."
  - c. 120.1(f)6.B.iii: I think this should be listed as an exception to Section 120.1(f)6.B.ii (not 120.1(b)2). Also, normally, the Exception paragraph is not numbered.
  - d. 120.1(f)6.B.iv: How do you define unusual? That is ambiguous and unenforceable that is not appropriate code language. Why don't you just keep the air classifications in Std 62.1?
  - e. 120.1(f)6.B.iv and 120.1(f)6.B.v: These paragraphs should be indented one more level.
  - f. 120.1(g): The wrong table is referenced. This should reference Table 120.1-D.
  - g. 120.1(h): The language for this code section was omitted for brevity but actually it does change because the paragraph references all need to be updated.
  - h. 120.1(h): The existing Title 24 120.1(c)5.E requires ventilation to drop to 25% of normal rate in Table 120.1-A. But the note in new 120.1-A follows Std 62.1



occupied standby mode which drops ventilation to 0. This inconsistency needs to be fixed.

- i. Table 120.1-A: The notes column from this table in Std 62.1 was omitted, which changes the meaning of some requirements and omits clarifications.
- j. Table 120.1-A: The occupancy categories are different from those in the CMC. This is likely to lead to confusion and contradictions. For example, CMC has higher rates for occupiable storage for liquids and gels, but that is not included in this table. So engineers will now need to always look at categories in both tables to see which apply and which are higher? Is supply ventilation for auto repair really required – this is not “aligned” or “harmonized” with Std 62.1 which does not require supply ventilation to auto repair. The exhaust ventilation will almost always dwarf this at 1.5 cfm/sf.
- k. Table 120.1-D: The notes column from this table in Std 62.1 was omitted, which changes the meaning of some requirements and omits clarifications, such as how to use the rates with two values.