

**INTERPRETATION IC 62.1-2013-3 OF
ANSI/ASHRAE STANDARD 62.1-2013
VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY**

Approved: January 25, 2015

Request from: Dennis A. Stanke (Dstanke47@gmail.com), N4959 Oakview Drive, West Salem, WI 54669.

Reference: This request for interpretation refers to the requirements presented in ANSI/ASHRAE Standard 62.1-2013, Sections 6.3.1 thru 6.3.6, regarding the Indoor Air Quality (IAQ) Procedure.

Background No. 1:

“6.3.1 Contaminant Sources. Contaminants or mixtures of concern, for purposes of the design, shall be identified. For each contaminant or mixture of concern, indoor sources (occupants and materials) and outdoor sources shall be identified, and the emission rate for each contaminant of concern from each source shall be determined.”

This section requires the identification of either individual contaminants or contaminant mixtures, which the designer or design team deems to be “of concern” for the project. Many contaminants are present indoors at low levels. Contaminants and contaminant mixtures vary by building type, use and maintenance. The standard includes no comprehensive, normative list of potential contaminants or mixtures of concern, either directly or by reference, and it does not require specific methods or criteria to be used to establish a list of any contaminants or mixtures of concern. (Appendix B includes informative partial lists and references some resources for indoor contaminants and contaminant mixtures, but these lists and references are not part of the Standard.)

Furthermore, this section requires identification of sources for each contaminant or contaminant mixture (and indirectly, each mixture constituent) deemed to be of concern, but it does not require specific methods or criteria to be used to identify such sources.

Lastly, this section requires determination of the emission rate of each contaminant of concern from each identified source, but it does not require the use of standard methods to determine such emission rates. Also, it does not require the determination of the emission rate for each mixture (or mixture constituent) of concern.

Interpretation No. 1a: The standard requires the identification of contaminants or mixtures of concern, the identification of each source for each contaminant or mixture of concern, and the determination of contaminant emission rates for each identified contaminant (but not for each mixture) from each identified source.

Question No. 1a: Is this interpretation correct?

Answer No. 1a: Yes

Comments 1a: The section in question has been modified by Addendum j to Standard 62.1-2013.

Interpretation No. 1b: Since the standard does not require specific methods or criteria to be used to make such identifications and determinations, all of these requirements must be met based on the judgment of the designer or design team, using personal expertise or other resources, which are not specified in the standard.

Question No. 1b: Is this interpretation correct?

Answer No. 1b: Yes

Background No. 2:

“6.3.2 Contaminant Concentration. For each contaminant of concern, a concentration limit and its corresponding exposure period and an appropriate reference to a cognizant authority shall be specified.”

- 1) For each contaminant of concern, this section requires specification of a concentration limit and a corresponding exposure time-period. While the purpose for specifying an appropriate reference to a cognizant authority is unclear, it is presumably to cite an appropriate reference-source for the concentration limits and exposure periods used to do the IAQP calculations. Information related to contaminant concentration limits and exposure times for each contaminant of concern must be obtained from the specified cognizant authority.
- 2) This section only addresses contaminants of concern; it does not address contaminant mixtures of concern or the constituents of such mixtures.

Interpretation No. 2a: Without specific normative resources or other selection criteria, identification of cognizant authorities to cite as a reference for the concentration limit and corresponding exposure time for each contaminant of concern must be established based on the judgment of the designer or design team.

Question No. 2a: Is this interpretation correct?

Answer No. 2a: Yes

Interpretation No. 2b: Although mixtures of concern must be identified (along with their sources) to comply with Section 6.3.1, no limits or exposure times for mixtures of concern need be determined and no cognizant authorities need be specified for mixtures or mixture constituents.

Question No. 2b: Is this interpretation correct?

Answer No. 2b: Yes

Comments 2b: Currently, the relevant Section 6.3.2 is limited to the term contaminant and does not include requirements for mixtures. The section in question has been modified by Addendum j to Standard 62.1-2013.

Background No.3:

“6.3.3. Perceived Indoor Air Quality. The design level of indoor air acceptability shall be specified in terms of the percentage of building occupants and/or visitors expressing satisfaction with perceived IAQ.”

This text does not indicate whether the specified percentage must be a minimum, maximum or absolute target. It would be logical that it means, implicitly, a minimum percentage.

As written, using “and/or” as part of the normative language, three optional unique compliance alternatives seem possible:

- 1) The percentage of building occupants (adapted persons) expressing satisfaction with the acceptability of perceived indoor air quality must be specified.
- 2) The percentage of building visitors (unadapted persons) expressing satisfaction with the acceptability of perceived indoor air quality must be specified.
- 3) The percentage of both building occupants and visitors (both adapted and unadapted persons) expressing satisfaction with the acceptability of perceived indoor air quality must be specified.

The percentage of individuals in a class (occupant or visitor) who are satisfied with the perceived IAQ must be specified, apparently at the discretion of the designer or design team. The class of individuals judging IAQ acceptability may be building occupants, visitors, or both occupants and visitors, apparently at the discretion of the designer or design team. (In contrast, the VRP rates are based on the assumption of 80% satisfaction of a single class, namely adapted occupants.)

Interpretation No. 3a: For design purposes, compliance with the IAQP requires specification of the minimum satisfaction percentage of a class of individuals, even though “minimum” is implicit.

Question No. 3a: Is this interpretation correct?

Answer No. 3a: Yes

Interpretation No. 3b: The class of individual is permitted to be either building occupants, visitors or both occupants and visitors.

Question No. 3b: Is this interpretation correct?

Answer No. 3b: Yes

Interpretation No. 3c: Both the specified percentage satisfied and the class of individuals to be satisfied is to be based on the judgment of the designer or design team.

Question No. 3c: Is this interpretation correct?

Answer No. 3c: Yes

Background No. 4:

“6.3.4 Design Approach. Zone and system outdoor airflow rates shall be the larger of those determined in accordance with Section 6.3.4.1 and either Section 6.3.4.2 or 6.3.4.3, based on emission rates, concentration limits, and other relevant design parameters (e.g., air cleaning efficiencies and supply airflow rates).

6.3.4.1 Mass Balance Analysis. Using a steady-state or dynamic mass-balance analysis, determine the minimum outdoor airflow rates required to achieve the concentration limits specified in Section 6.3.2 for each contaminant or mixture of concern within each zone served by the system.

6.3.4.2 Subjective Evaluation. Using a subjective occupant evaluation conducted in the completed building, determine the minimum outdoor airflow rates required to achieve the level of acceptability specified in Section 6.3.3 within each zone served by the system.

6.3.4.3 Similar Zone. The minimum outdoor airflow rates shall be no less than those found in accordance with Section 6.3.4.2 for a substantially similar zone (i.e., in a zone with identical contaminants of concern, concentration limits, air cleaning efficiency, and specified level of acceptability; and with similar contaminant sources and emission rates).”

Section 6.3.4 requires that both zone and system outdoor airflow rates (V_{bz} and V_{ot}) be determined in accordance with Section 6.3.4.1 AND either Section 6.3.4.2 or 6.4.3.3. However, as written, Section 6.3.4.1 thru 6.3.4.3 applies only to the determination of zone outdoor airflow (V_{bz}) rates. In other words, although 6.3.4 requires the determination of system outdoor air intake rates (V_{ot}), the subsections only address requirements for zone outdoor airflow. Once established in accordance with Section 6.3.4, zone outdoor airflow rates could be used with the equations in Section 6.2.3 – 6.2.5 to find outdoor air intake flow (V_{ot}), but the IAQP neither requires nor prohibits this. Since their use is not specifically prohibited, the Section 6.2.3 – 6.2.5 equations seem to be an acceptable approach for determining outdoor air intake flow (V_{ot}), even when zone outdoor airflow is found using the IAQP.

Interpretation No. 4: Section 6.3.4 “design approach” must be used to determine zone outdoor airflow rates (V_{bz}) based on contaminants of concern, sources, emission rates, target concentrations for specific exposure times, and air cleaning efficiency where relevant, but since the text in Section 6.3.4.1 conflicts with the text in Section 6.3.4, the IAQP need not be used to determine system outdoor air intake flow (V_{ot}).

Question No. 4: Is this interpretation correct?

Answer No. 4: Yes

Comments 4: The section in question has been modified by Addendum j to Standard 62.1-2013.