

**INTERPRETATION IC 62-2001-44 OF
ANSI/ASHRAE STANDARD 62-2001
VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY**

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Reference: This request for interpretation refers to Section 6.1.3.1 of ANSI/ASHRAE Standard 62-2001 relating to the outdoor air ventilation requirements for multiple spaces.

Background: The procedure for computing required outdoor air in a system serving multiple spaces includes Equation 6-1 and the following definitions:

$$Y = X / (1 + X - Z) \qquad \text{Eq. 6-1}$$

Y = V_{ot}/V_{st} = corrected fraction of outdoor air in system supply

X = V_{on}/V_{st} = uncorrected fraction of outdoor air in system supply

Z = V_{oc}/V_{sc} = fraction of outdoor air in critical space

V_{ot} = corrected total outdoor air flow rate

V_{st} = total supply flow rate, i.e., the sum of all supply for all branches of the system

V_{on} = sum of outdoor air flow rates for all branches on system

V_{oc} = outdoor air flow rate required in critical spaces [sic]

V_{sc} = supply flow rate in critical space

The Standard stipulates that "the critical space is that space with the greatest required fraction of outdoor air in the supply to this space." It is obvious by definition that there can be only one critical space served by a system. What is not obvious is whether there may be more than one space whose required fraction of outdoor air exceeds the corrected fraction of outdoor air in the system supply (Y). We assume that the overall satisfaction of Equation 6-1 assures that all spaces served are individually satisfied, so long as their individual supply air flow rates are taken into consideration in the equation.

As an example, consider a system which serves assorted offices, conference rooms, and support spaces. (Refer to the accompanying spreadsheet.) Analysis of the system reveals that Conference Room 1169 is the Critical Space, requiring an outdoor air fraction of 0.45 (or 45% OA). When the pertinent system values are inserted into Equation 6-1, it is shown that a corrected fraction of outdoor air of 0.28 is required to ensure sufficient outdoor air to the Critical Space. However, the tabularized data also show that two other spaces -- viz., Conference Room 1168 and Huddle Room 1165 -- require outdoor air fractions which exceed the corrected outdoor air fraction of 0.28; these rooms require 0.433 and 0.343, respectively. It is our assumption that these two rooms will be satisfied, from a ventilation standpoint, because the overall Equation 6-1 is satisfied for this system.

Interpretation: Application of Equation 6-1 allows more than one space whose required fraction of outdoor air exceeds Y, the corrected fraction of outdoor air in the system supply.

Question: Is this Interpretation correct?

Answer: Yes

Comments: Equation 6-1 results in intake airflow sufficient to satisfy the ventilation requirement of the ventilation-critical zone. The outdoor air fraction in the primary air is a combination of first-pass outdoor air from the intake and unused recirculated outdoor air. The primary outdoor air fraction equals the critical zone fraction (0.45 in your example). All zones receive the same primary outdoor air fraction, so the critical zone is properly ventilated and all other zones are over-ventilated. Note: The accompanying spreadsheet, as referenced above, was included for illustrative purposes but was not necessary for the interpretation.