INTERPRETATION IC 62-1999-25 OF
ANSI/ASHRAE STANDARD 62-1999
VENTILATION FOR ACCEPTABLE INDOOR AIR QUALITY

TRANSFER TO 62-1999 APPROVED: August 14, 2000

Originally issued as interpretation of Standard 62-1989 (IC 62-1989-17) on September 11 and 27, 1994, but transferred to Standard 62-1999. Since no changes were made to the relevant sections of Standard 62-1999, no revisions were made to the interpretation as part of this transfer.

Request from: Paul B. Miskowicz, P.E., Integrated Planning & Engineering, Inc., 3333 S. Wadsworth Blvd., Suite D231, Lakewood, CO, 80227

References. This request refers to the requirements given in ANSI/ASHRAE Standard 62-1989, Subsections 5.4, 6.1.3.4 and 6.1.3.1.

Background No. 1. Mr. Miskowicz's letter of June 28, 1994 states:

Subsection 5.4 reads:
"5.4 When the supply of air is reduced during times when the space is occupied, provision shall be made to maintain acceptable indoor air quality throughout the occupied zone."

Subsection 6.1.3.4 states in part:
"6.1.3.4 Intermittent or Variable Occupancy. Ventilating systems for spaces with intermittent or variable occupancy may have their outdoor air quantity adjusted by use of dampers or by stopping and starting the fan system to provide sufficient dilution to maintain contaminant concentrations within acceptable levels at all times."

Table 2 lists "Outdoor Air Requirements for Ventilation" based on the type of space.

IP&E's Interpretation No. 1. IP&E interprets that supply fans can be duty cycled on and off during occupied times for energy conservation, provided that the supply of outdoor air to the occupied space provides sufficient dilution to maintain contaminant concentrations within acceptable levels at all times, even if this produces a time-averaged rate of outside air introduction that is less than the rate set forth in Table 2.

Background No. 2. Subsection 6.1.3.1 Multiple Spaces gives a procedure for determining the system outdoor air quantity, and Table 2 lists "outdoor air requirements for ventilation" based on the type of space.

IP&E's Interpretation No. 2. IP&E interprets that it is acceptable to provide less than the quantity of outside air called for in Table 2 to the critical space in an application where one supply system serves multiple spaces with differing outside air requirements, example:

Consider a system that serves two spaces with Table 2 outdoor air requirements (e.g., cfm/person x persons) of 100 and 500 cfm (47 and 236 l/s) respectively, and supply airflow rates (dictated by temperature control requirements) of 1000 cfm (472 l/s) each. Equation 6-1 yields a corrected outdoor-air-in-system fraction (OAF) of 0.375. But at this OAF, the rate of outdoor air delivered to the critical space with 1000 cfm (472 l/s) of total supply is 375 cfm (177 l/s) versus the 500 cfm (236 l/s) requirement calculated from Table 2.

IP&E interprets Subsection 6.1.3.1 to allow the corrected (reduced) amount of outside air to be used to avoid designing a system that consumes an excess amount of energy while maintaining a minimum level of acceptable ventilation.

Question 1. Is IP&E's Interpretation No. 1 correct?

Answer 1. No.

Comment: When the user of the standard chooses the ventilation rate procedure involving Table 2, the time-averaged rate of outdoor air is required to be at least that specified in Table 2. The indoor air quality procedure of clause 6.2 must be used if methods other than outdoor ventilation rate are used to control contaminants so that the time-averaged ventilation rates drop below that of Table 2.

Question 2. Is IP&E's Interpretation No. 2 correct?

Answer 2. Yes.

Comment: This is a direct application of Equation 6-1.

Using the symbols of that equation, the uncorrected fraction of outdoor air in the system supply, X, is 600/2000 = 0.3. The fraction of outdoor air in the critical space, Z, is 500/1000 = 0.5. Therefore, the corrected fraction of outdoor air in the system supply is $0.3/(1 + 0.3 - 0.5) = 0.375$.

The outdoor air supplied to the system must be 0.375(2000) = 750 cfm (354 l/s). The total outdoor air, 750 cfm (354 l/s), is greater than the 600 cfm (283 l/s) required by Table 2 if two separate outdoor air supplies were available, yet less than the 1000 cfm (472 l/s) required if the outdoor air supply were set by the critical space requiring 500 cfm (236 l/s).