INTERPRETATION IC 62.1-2013-4 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, Section 6.3.4, regarding the Indoor Air Quality Procedures Design Approach: Air Cleaning.

Background:

"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)."

Section 6.3.4 requires that zone outdoor airflow be determined based in part on a mass balance analysis (Section 6.3.4.1). The mass balance analysis must be based on emission rates, concentration limits, and "other relevant parameters" (perhaps, air cleaning efficiencies and supply airflow rates). This requirement implies, but does not specifically state, that air cleaning devices are allowed as a means of reducing zone contaminant concentrations and thus, are allowed to be used to reduce zone outdoor airflow requirements.

For example, if a 100% outdoor-air VAV system serves the zones in a building, the equations in Appendix D can be used as part of a mass balance analysis to find steady-state values for zone outdoor airflow (*Vbz*) for each zone. Assume the following: Formaldehyde (HCHO) is identified as a contaminant of concern, the target 8-hour HCHO concentration limit Cbz in any zone is 27 ppb (0.033 mg/m3), the indoor emission rate N in a specific zone is 155 mg/hr, the outdoor HCHO concentration Co is 0.0068 mg/m3, all zones have a zone air distribution effectiveness of Ez = 1.0 and the specific zone considered is at design airflow (Fr = 1.0). Without HCHO air cleaning Ef = 0 and the zone would require at least *Vbz* = 3520 cfm of outdoor air, (*Vbz* = N/{(Ez)(Fr)[Cbz – (1 – Ef)(Co)]} = 155/{(1.0)(1.0)[0.0330 – (1 – 0)(0.0068)]} = 3520 cfm) at design. With HCHO air cleaning at an HCHO removal efficiency of 50% (Ef = 0.50), the outdoor air needed for this zone at design would be reduced to 3120 cfm.

Note: The outdoor airflow rate needed for each contaminant of concern for this zone would also need to be calculated using a mass balance analysis; then presumably, the highest zone outdoor airflow rate would be used as the design minimum rate.

Interpretation: Using the required mass balance analysis to determine zone outdoor airflow rate, the phrase "other relevant parameters" allows the use of gaseous air cleaners, particle filters

or both to remove contaminants and thereby to reduce the outdoor airflow required for a zone, compared to a zone without air cleaning.

Question: Is this interpretation correct?

Answer: Yes

Comments: It is important to recognize that the IAQP is intended to provide acceptable indoor air quality in the breathing zone of the occupant. Therefore, the analysis must account for the performance and spatial impact of the air cleaning device.