ANSI/ASHRAE Addendum h to

Ventilation for Acceptable Indoor Air Quality

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ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

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outdoor air treatment when necessary

The requirements for outdoor air quantities are for 100% outdoor air, they also set the amount of air required to dilute contaminants to acceptable levels. Therefore, it is necessary that at least this amount of air be delivered to the conditioned space at all times the building is in use except as modified in 6.1.3.4.

Properly cleaned air may be recirculated. Under the ventilation rate procedure, for other than intermittent variable occupancy as defined in 6.1.3.4, outdoor air flow rates may not be reduced below the requirements in Table 2. If cleaned, recirculated air is used to reduce the outdoor air flow rate below the values shown in Table 2, the Air Quality Procedure, 6.2, must be used. The air-cleaning system for the recirculated air may be located in the recirculated air or in the mixed outdoor and recirculated air stream (see Fig. 1).

The recirculation rate for the system is determined by the air-cleaning system efficiency. The recirculation rate must be increased to achieve full benefit of the air-cleaning system. The air-cleaning used to clean recirculated air should be designed to reduce particulate and, where necessary and feasible, gaseous contaminants. The system shall be capable of providing indoor air quality equivalent to that obtained using outdoor air at a rate specified in Table 2. Appendix E may be referenced for assistance in calculating the air flow requirements for commonly used air distribution systems.

Delete existing Section 6.3 and replace with the following:

6.3 Indoor Air Quality Procedure

The Indoor Air Quality (IAQ) Procedure is a performance-based design approach in which the building and its ventilation system are designed to maintain the concentrations of specific contaminants at or below certain limits identified during the building design and to achieve the design target level of perceived indoor air quality acceptability by building occupants and/or visitors. For the purposes of this procedure, acceptable perceived indoor air quality excludes dissatisfaction related to thermal comfort, noise and vibration, lighting, and psychological stressors.

6.3.1 Designs employing the Indoor Air Quality Procedure shall comply with the requirements in the following sections.

6.3.1.1 Contaminant Sources. Contaminants of concern for purposes of the design shall be identified. For each contaminant of concern, indoor and outdoor sources shall be identified, and the strength of each source shall be determined.

6.3.1.2 Contaminant Concentration. For each contaminant of concern, a target concentration limit and its corresponding exposure period and an appropriate reference to a cognizant authority shall be specified. (See Appendix B for some contaminant concentration guidelines.)

6.3.1.3 Perceived Indoor Air Quality. The criteria to achieve the design level of acceptability shall be specified in terms of the percentage of building occupants and/or visitors expressing satisfaction with perceived indoor air quality.

6.3.1.4 Design Approaches. Select one or a combination of the following design approaches to determine minimum space and system outdoor airflow rates and all other design parameters deemed relevant (e.g., air cleaning efficiencies and supply airflow rates).

(a) Mass balance analysis. The steady-state equations in Appendix D, which describe the impact of air cleaning on outdoor air and recirculation rates, may be used as part of a mass balance analysis for ventilation systems serving a single space.
(b) Design approaches that have proved successful in similar buildings.

(c) Approaches validated by contaminant monitoring and subjective occupant evaluations in the completed building. An acceptable approach to subjective evaluation is presented in Appendix B, which may be used to validate the acceptability of perceived air quality in the completed building.

(d) Application of one of the preceding design approaches (a, b, or c) to specific contaminants and the use of the Ventilation Rate Procedure to address the general aspects of indoor air quality in the space being designed. In this situation, the Ventilation Rate Procedure would be used to determine the design ventilation rate of the space and the IAQ Procedure would be used to address the control of the specific contaminants through air cleaning or some other means.

6.3.2 Documentation. When the IAQ Procedure is used, the following information shall be included in the design documentation: the contaminants of concern considered in the design process; the sources and source strengths of the contaminants of concern; the target concentration limits and exposure periods and the references for these limits; the design approach used to control the contaminants of concern; and the background or justification for this design approach. If the design is based on an approach that has proved successful for similar buildings, the documentation shall include the basis for concluding that the design approach was successful in the other buildings and the basis for concluding that the previous buildings are relevant to the new design. If contaminant monitoring and occupant evaluation are to be used to demonstrate compliance, then the monitoring and evaluation plans shall also be included in the documentation.

Delete References 29 and 30 from Section 9. [Text containing these references has been deleted from the body of the standard.]


ASHRAE is concerned with the impact of its members’ activities on both the indoor and outdoor environment. ASHRAE’s members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted standards and the practical state of the art.

ASHRAE’s short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the standards and guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive technical committee structure, continue to generate up-to-date standards and guidelines where appropriate and adopt, recommend, and promote those new and revised standards developed by other responsible organizations.

Through its Handbook, appropriate chapters will contain up-to-date standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating standards and guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system’s intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE’s primary concern for environmental impact will be at the site where equipment within ASHRAE’s scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.