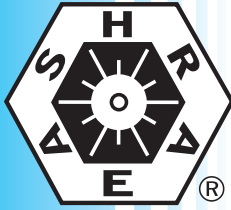


ANSI/ASHRAE Standard 62.1-2004
(Includes ANSI/ASHRAE Addenda listed in Appendix H)



ASHRAE STANDARD

Ventilation for Acceptable Indoor Air Quality

See Appendix H for approval dates by the ASHRAE Standards Committee, the ASHRAE Board of Directors, and the American National Standards Institute.

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

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- b. participation in the next review of the Standard,
- c. offering constructive criticism for improving the Standard,
- d. permission to reprint portions of the Standard.

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NOTE

When addenda, interpretations, or errata to this standard have been approved, they can be downloaded free of charge from the ASHRAE Web site at <http://www.ashrae.org>.

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FOREWORD

ANSI/ASHRAE Standard 62.1-2004 is the latest edition of Standard 62, which has been given the new designation of 62.1 to distinguish it from ANSI/ASHRAE Standard 62.2-2004, Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings. The 2004 edition combines Standard 62-2001 and the seventeen approved and published addenda to the 2001 edition, thereby providing an easy-to-use consolidated standard. Specific information on the contents of each addendum and its approval dates are included in informative Appendix H at the end of this standard.

First published in 1973, Standard 62.1 is now updated on a regular basis using ASHRAE's continuous maintenance procedures. According to these procedures, Standard 62.1 is continuously revised—potentially several times a year—by addenda that are publicly reviewed, approved by ASHRAE and ANSI, and published on the ASHRAE web site. Because the standard changes as new addenda are published, users are encouraged to sign up for the free internet list server for this standard, which provides notice of all public reviews and approved and published addenda and errata. Users who prefer not to subscribe to the list server may periodically review the ASHRAE web site to ensure that they have all of the published addenda.

Standard 62.1 has undergone some key changes over the years to reflect the benefits of experience and ongoing research about air quality. While the purpose of the standard has remained consistent—“to specify minimum ventilation rates and indoor air quality that will be acceptable to human occupants and are intended to minimize the potential for adverse health effects”—the means of achieving this goal have evolved. In its first edition the standard adopted a prescriptive approach to ventilation by specifying both minimum and recommended outdoor air flow rates to obtain acceptable indoor air quality for a variety of indoor spaces. In the 1981 edition of the standard an alternative procedure, the Indoor Air Quality (IAQ) Procedure, was introduced. This performance-based procedure allowed the use of any amount of outdoor air deemed necessary if the designer can show that the levels of indoor air contaminants are held below recommended limits. Today the standard still retains the two procedures for ventilation design, the IAQ Procedure and the Ventilation Rate Procedure.

Since 2001, the last time the standard was published in its entirety, it has been updated and revised in a number of significant ways:

- *The IAQ Procedure is modified by converting the material in the standard into requirements that are stated in mandatory and enforceable language. (Addendum 62h)*
- *The Ventilation Rate Procedure is revised to reflect recent information regarding ventilation impacts on*

indoor air quality and to clarify the adjustments necessary for space air distribution and system efficiency of multi-zone recirculating systems. The breathing zone ventilation rate now includes both an area-related component and an occupant-density-related component, which are added together to determine the required ventilation for the space. (Addendum 62n)

- *The Minimum Ventilation Rate table is revised to apply only to no-smoking spaces by deleting smoking lounges from the list of occupancy categories. Also, some rates are lowered based upon their application to no-smoking spaces only. For smoking-permitted spaces, additional (but unspecified) ventilation in excess of the rates listed in the table is required. (Addendum 62o)*
- *A new informative appendix, Appendix G, is added. Entitled “Application and Compliance,” Appendix G provides guidance on when the standard applies to new and existing buildings. It also contains a code-intended language version that could be adopted, with or without modification, by jurisdictions that have not adopted a building code. (Addendum 62k)*
- *Requirements concerning indoor air humidity and the building envelope are added and other requirements are clarified to avoid potential indoor air quality problems. Building pressurization is required to minimize infiltration of moist indoor air. (Addendum 62x)*
- *Requirements are added to ensure that air distribution systems are capable of delivering outdoor air to the occupied spaces. (Addendum 62v)*
- *A requirement is added for particle filtration when outdoor air particulate levels are deemed harmfully high by cognizant authorities. (Addendum 62r)*
- *Air is classified with respect to contaminant and odor intensity, and limits are placed on the recirculation of lower-quality air into spaces containing air of higher quality. (Addendum 62y)*
- *Air cleaning requirements are added for ozone in outdoor air. Gaseous air cleaning is required when the second-highest daily maximum one-hour average concentration exceeds 0.160 ppm (313 $\mu\text{g}/\text{m}^3$). (Addendum 62z)*
- *Informative Appendix B, is updated and clarified. Renamed to “Summary of Selected Air Quality Guidelines,” Appendix B provides resources for designers using the Indoor Air Quality Procedure. (Addendum 62ad)*
- *The purpose and scope of the standard are revised to clarify its relevance to new and existing buildings and its coverage of laboratory and industrial spaces. (Addendum 62af)*

For more specific information on these changes and on other revisions made to the standard by other addenda, refer to informative Appendix H at the end of this standard.

Users of the standard are encouraged to use the continuous maintenance procedure to suggest changes for further improvements. A form for submitting proposed changes to the standard is included in the back of this edition. The project committee for Standard 62.1 will take formal action on all proposals received.

1. PURPOSE

1.1 The purpose of this standard is to specify minimum ventilation rates and indoor air quality that will be acceptable to human occupants and are intended to minimize the potential for adverse health effects.

1.2 This standard is intended for regulatory application to new buildings, additions to existing buildings, and those changes to existing buildings that are identified in the body of the standard.

1.3 This standard is intended to be used to guide the improvement of indoor air quality in existing buildings.

2. SCOPE

2.1 This standard applies to all indoor or enclosed spaces that people may occupy, except where other applicable standards and requirements dictate larger amounts of ventilation than this standard. Release of moisture in residential kitchens and bathrooms, locker rooms, and swimming pools is included in the scope of this standard.

2.2 Additional requirements for laboratory, industrial, and other spaces may be dictated by workplace and other standards, as well as by the processes occurring within the space.

2.3 Although the standard may be applied to both new and existing buildings, the provisions of this standard are not intended to be applied retroactively when the standard is used as a mandatory regulation or code.

2.4 This standard considers chemical, physical, and biological contaminants that can affect air quality. Thermal comfort requirements are not included in this standard.

2.5 Acceptable indoor air quality may not be achieved in all buildings meeting the requirements of this standard for one or more of the following reasons:

- (a) because of the diversity of sources and contaminants in indoor air;
- (b) because of the many other factors that may affect

occupant perception and acceptance of indoor air quality, such as air temperature, humidity, noise, lighting, and psychological stress;

- (c) because of the range of susceptibility in the population; and
- (d) because outdoor air brought into the building may be unacceptable or may not be adequately cleaned.

3. DEFINITIONS (see Figure 3.1)

acceptable indoor air quality: air in which there are no known contaminants at harmful concentrations as determined by cognizant authorities and with which a substantial majority (80% or more) of the people exposed do not express dissatisfaction.

air-cleaning system: a device or combination of devices applied to reduce the concentration of airborne contaminants, such as microorganisms, dusts, fumes, respirable particles, other particulate matter, gases, and/or vapors in air.

air conditioning: the process of treating air to meet the requirements of a conditioned space by controlling its temperature, humidity, cleanliness, and distribution.

air, ambient: the air surrounding a building; the source of outdoor air brought into a building.

air, exhaust: air removed from a space and discharged to outside the building by means of mechanical or natural ventilation systems.

air, indoor: the air in an enclosed occupiable space.

air, makeup: any combination of outdoor and transfer air intended to replace exhaust air and exfiltration.

air, outdoor: ambient air that enters a building through a ventilation system, through intentional openings for natural ventilation, or by infiltration.

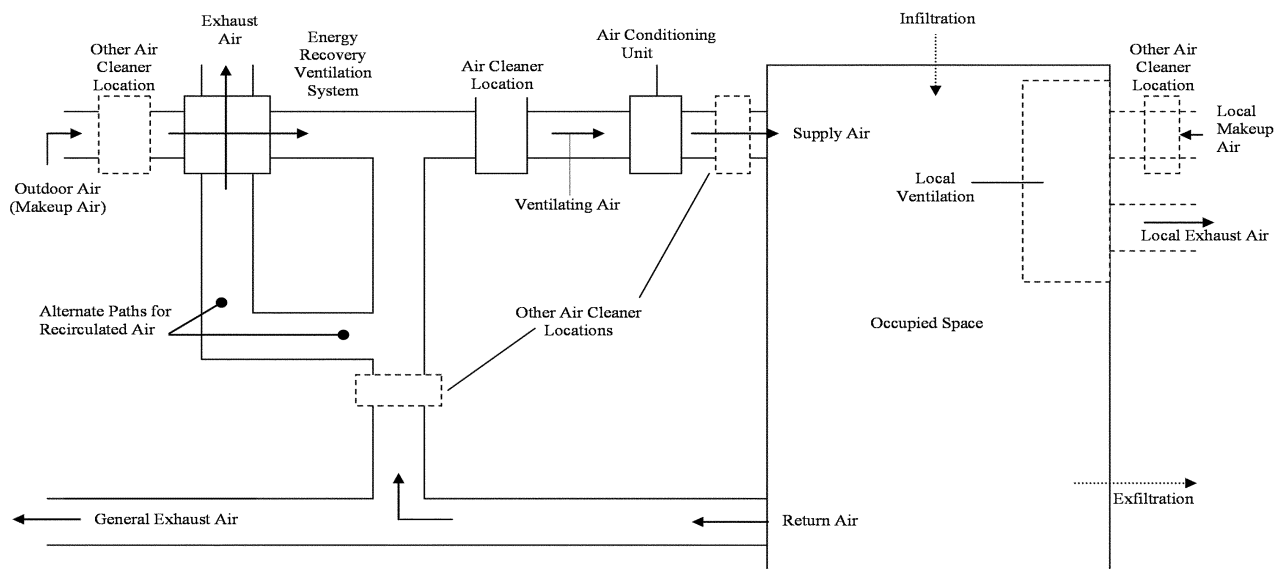


Figure 3.1 Ventilation system.