ADDENDA

ANSI/ASHRAE Addendum e to
ANSI/ASHRAE Standard 62.1-2016

Ventilation for Acceptable Indoor Air Quality

Approved by the ASHRAE Standards Committee on January 20, 2018; by the ASHRAE Technology Council on January 24, 2018; and by the American National Standards Institute on January 25, 2018.

This addendum was approved by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. The change submittal form, instructions, and deadlines may be obtained in electronic form from the ASHRAE website (www.ashrae.org) or in paper form from the Senior Manager of Standards.

The latest edition of an ASHRAE Standard may be purchased on the ASHRAE website (www.ashrae.org) or from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: orders@ashrae.org. Fax: 678-539-2129. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in US and Canada). For reprint permission, go to www.ashrae.org/permissions.

 ISSN 1041-2336

Approved American National Standard
ANSI
www.ansi.org

SPECIAL NOTE

This American National Standard (ANS) is a national voluntary consensus Standard developed under the auspices of ASHRAE. *Consensus* is defined by the American National Standards Institute (ANSI), of which ASHRAE is a member and which has approved this Standard as an ANS, as "substantial agreement reached by directly and materially affected interest categories. This signifies the concurrence of more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that an effort be made toward their resolution." Compliance with this Standard is voluntary until and unless a legal jurisdiction makes compliance mandatory through legislation.

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

ASHRAE Standards are prepared by a Project Committee appointed specifically for the purpose of writing the Standard. The Project Committee Chair and Vice-Chair must be members of ASHRAE; while other committee members may or may not be ASHRAE members, all must be technically qualified in the subject area of the Standard. Every effort is made to balance the concerned interests on all Project Committees.

The Senior Manager of Standards of ASHRAE should be contacted for

a. interpretation of the contents of this Standard,
b. participation in the next review of the Standard,
c. offering constructive criticism for improving the Standard, or
d. permission to reprint portions of the Standard.

DISCLAIMER

ASHRAE uses its best efforts to promulgate Standards and Guidelines for the benefit of the public in light of available information and accepted industry practices. However, ASHRAE does not guarantee, certify, or assure the safety or performance of any products, components, or systems tested, installed, or operated in accordance with ASHRAE's Standards or Guidelines or that any tests conducted under its Standards or Guidelines will be nonhazardous or free from risk.

ASHRAE INDUSTRIAL ADVERTISING POLICY ON STANDARDS

ASHRAE Standards and Guidelines are established to assist industry and the public by offering a uniform method of testing for rating purposes, by suggesting safe practices in designing and installing equipment, by providing proper definitions of this equipment, and by providing other information that may serve to guide the industry. The creation of ASHRAE Standards and Guidelines is determined by the need for them, and conformance to them is completely voluntary.

In referring to this Standard or Guideline and in marking of equipment and in advertising, no claim shall be made, either stated or implied, that the product has been approved by ASHRAE.

(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

FOREWORD

Appendices F and I first appeared in 62.1-2010. In 2007, the information was located in the body of the standard. To move informative documentation out of the standard, informative appendices were added. These referred primarily to the United States and to information regarding the NAAQS. To add international information, these appendices are rewritten to provide up-to-date links and combine information on outdoor air into one informative appendix.

Please note that there is no current map for when the most recent three-year average annual fourth-highest daily maximum eight-hour average ozone concentration exceeds 0.107 ppm (209 μg/m^3). Therefore the map and reference to it are deleted by this addendum.

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum e to Standard 62.1-2016

Modify the Informative Note in Section 4.1.1 as shown.

4.1.1 In the United States, compliance status shall be either in "attainment" or "nonattainment" with the *National Ambient Air Quality Standards* (NAAQS) [1]. In the United States, areas with no U.S. Environmental Protection Agency (USEPA) compliance status designation shall be considered "attainment" areas.

Informative Note: The NAAQS are shown in ~~Table I-1~~ Table F-1 of Informative Appendix ~~I~~ F.

Delete the Informative Note in Section 6.2.1.3 as shown.

6.2.1.3 Air-cleaning devices for ozone shall be provided when the most recent three-year average annual fourth-highest daily maximum eight-hour average ozone concentration exceeds 0.107 ppm (209 μg/m^3).

Such air-cleaning devices shall have a volumetric ozone removal efficiency of not less than 40% where installed, operated, and maintained in accordance with manufacturer recommendations and shall be approved by the authority having jurisdiction. Such devices shall be operated where the outdoor ozone levels are expected to exceed 0.107 ppm (209 μg/m3).

Exceptions: Air cleaning for ozone shall not be required where

1. the system design outdoor air intake flow is 1.5 ach or less,
2. controls are provided that sense outdoor ozone level and reduce intake airflow to 1.5 ach or less while complying with the outdoor airflow requirements of Section 6, or
3. outdoor air is brought into the building and heated by direct-fired makeup air units.

~~***Informative Note:*** See Informative Appendix F for a map of United States locations exceeding the most recent three-year average annual fourth-highest daily maximum eight-hour average ozone concentration of 0.107 ppm (209 μg/m^3).~~

Modify Informative Appendix F as shown. Delete current Table F-1 and replace with the table shown. Delete Figure F-1.

(This appendix is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

INFORMATIVE APPENDIX F
INFORMATION ON SELECTED NATIONAL STANDARDS AND GUIDELINES FOR PM10, PM2.5, AND OZONE

~~**Table F-1 Information Sources for Identifying Noncomplying Locations** (Information Current as of October 1, 2015)~~
~~**Figure F-1 California 8-hour ozone nonattainment areas.** (Source: USEPA)~~

Standard 62.1, Section 4, requires that the status of compliance with National Ambient Air Quality Standards (NAAQS) shall be determined for the geographical area of the building site. Table F-1 is a representative table presenting the NAAQS information for the United States. Links to the detailed information on the ambient air quality standards and contaminant levels for other select counties and regions can be found at the following links:

- The United States National Ambient Air Quality Standards (NAAQS) can be found at https://www.epa.gov/green-book and at: https://www.epa.gov/criteria-air-pollutants/naaqs-table
- The Canadian Ambient Air Quality Standards can be found at http://www.ec.gc.ca/default.asp?lang=En&n=56D4043B-1&news=A4B2C28A-2DFB-4BF4-8777-ADF29B4360BD
- The Hong Kong Air Quality Objectives can be found at http://www.epd.gov.hk/epd/english/environmentinhk/air/air_quality_objectives/air_quality_objectives.html
- Singapore Air quality Targets can be found at http://www.nea.gov.sg/anti-pollution-radiation-protection
- European Commission Air Quality Standards can be found at http://ec.europa.eu/environment/air/quality/standards.htm
- The Brazil Air Quality Standards can be found at http://transportpolicy.net/index.php?title=Brazil:_Air_Quality_Standards

- The Indian National Ambient Air Quality Standards (NAAQS) can be found at http://cpcb.nic.in/National_Ambient_Air_Quality_Standards.php
- The Lebanese National Ambient Air Quality Standards (NAAQS) can be found at http://www.undp.org/content/dam/lebanon/docs/Energy%20and%20Environment/Publications/SOER_en.pdf
- The Saudi Arabian National Ambient Air Quality Standards (NAAQS) can be found at https://www.rcjy.gov.sa/en-US/AboutUs/Environment/Pages/default.aspx
- World Health Organization (WHO) Air Quality Guideline Values can be found at http://www.who.int/mediacentre/factsheets/fs313/en/

The Clean Air Act (https://www.epa.gov/clean-air-act-overview), which was last amended in 1990, requires USEPA to set National Ambient Air Quality Standards (40 CFR part 50) for pollutants considered harmful to public health and the environment. The Clean Air Act identifies two types of national ambient air quality standards. *Primary standards* provide public health protection, including protecting the health of "sensitive" populations, such as asthmatics, children, and the elderly. *Secondary standards* provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The USEPA has set National Ambient Air Quality Standards for six principal pollutants, which are called "criteria" air pollutants (https://www.epa.gov/criteria-air-pollutants). Periodically, the standards are reviewed and may be revised. The current standards are listed in Table F-1. Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb) by volume, and micrograms per cubic metre of air ($\mu g/m^3$).

Table F-1 National Ambient Air Quality Standards for the Unites States
(https://www.epa.gov/criteria-air-pollutants/naaqs-table)

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO) https://www.epa.gov/co-pollution/table-historical-carbon-monoxide-co-national-ambient-air-quality-standards-naaqs		Primary	Eight (8) hours	9 ppm	Not to be exceeded more than once per year
			One (1) hour	35 ppm	
Lead (Pb) https://www.epa.gov/lead-air-pollution/table-historical-lead-pb-national-ambient-air-quality-standards-naaqs		Primary and secondary	Rolling three (3) month average	0.15 μg/m^3 (Note 1)	Not to be exceeded
Nitrogen Dioxide (NO_2) https://www.epa.gov/no2-pollution/table-historical-nitrogen-dioxide-national-ambient-air-quality-standards-naaqs		Primary	One (1) hour	100 ppb	Ninety-eighth (98th) percentile of one-hour daily maximum concentrations, averaged over three years
		Primary and secondary	One (1) year	53 ppb (Note 2)	Annual mean
Ozone (O_3) https://www.epa.gov/ozone-pollution/table-historical-ozone-national-ambient-air-quality-standards-naaqs		Primary and secondary	Eight (8) hours	0.070 ppm (Note 3)	Annual fourth-highest daily maximum eight-hour concentration, averaged over three years
Particle Pollution (PM) https://www.epa.gov/pm-pollution/table-historical-particulate-matter-pm-national-ambient-air-quality-standards-naaqs	PM2.5	Primary	One (1) year	12.0 μg/m^3	Annual mean, averaged over three years
		Secondary	One (1) year	15.0 μg/m^3	Annual mean, averaged over three years
		Primary and secondary	Twenty-four (24) hours	35 μg/m^3	Ninety-eight (98th) percentile, averaged over three years
	PM10	Primary and secondary	Twenty-four (24) hours	150 μg/m^3	Not to be exceeded more than once per year on average over three years
Sulfur Dioxide (SO_2) https://www.epa.gov/so2-pollution/table-historical-sulfur-dioxide-national-ambient-air-quality-standards-naaqs		Primary	One (1) hour	75 ppb (Note 4)	Ninety-ninth (99th) percentile of one-hour daily maximum concentrations, averaged over three years
		Secondary	Three (3) hours	0.5 ppm	Not to be exceeded more than once per year

Note 1: In areas designated "nonattainment" for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 μg/m^3 as a calendar quarter average) also remain in effect.

Note 2: The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purpose of clearer comparison to the one-hour standard level.

Note 3: Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

Note 4: The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (a) any area for which it is not yet one year since the effective date of designation under the current (2010) standards, and (b) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and that is designated "nonattainment" under the previous SO_2 standards or is not meeting the requirements of an SIP call under the previous SO_2 standards (40 CFR 50.4(3)). An SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Delete Informative Appendix I.

(This appendix is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

INFORMATIVE APPENDIX I
NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

For locations within the United States, the following table shows the ambient air quality standards that determine the regional air quality status of "attainment" or "nonattainment" for the building location.

Table I-1 National Ambient Air Quality Standards (NAAQS)[I-1]

Pollutant	Primary Stds.	Averaging Times	Secondary Stds.
Carbon monoxide	9 ppm (10 mg/m^3)	8-hour[a]	None
	35 ppm (40 mg/m^3)	1-hour[a]	None
Lead	0.15 µg/m^3	Rolling three-month average	Same as primary
Nitrogen dioxide	100 ppb	1-hour[b]	—
	0.053 ppm (100 µg/m^3)	Annual (arithmetic mean)	Same as primary
Particulate matter (PM10)	150 µg/m^3	24-hour[c]	Same as primary
Particulate matter (PM2.5)	12 µg/m^3	Annual[d] (arithmetic mean)	15 µg/m^3
	35 µg/m^3	24-hour[b]	Same as primary
Ozone	0.075 ppm	8-hour[e]	Same as primary
Sulfur dioxide	75 ppb	1-hour[f]	—
	—	3-hour[(1)]	0.5 ppm

a. Not to be exceeded more than once per year.
b. 98th percentile, averaged over 3 years
c. Not to be exceeded more than once per year on average over 3 years.
d. Average over three years.
e. 3-year average of the fourth-highest daily maximum 8-hour average ozone concentration.
f. 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years.

REFERENCES

I-1. *National Primary and Secondary Ambient Air Quality Standards, Code of Federal Regulations, Title 40 Part 50 (40 CFR 50)*, as amended July 30, 2004 and Oct. 17, 2006. U.S. Environmental Protection Agency. www.epa.gov/air/criteria.html, accessed January 30, 2013.

POLICY STATEMENT DEFINING ASHRAE'S CONCERN FOR THE ENVIRONMENTAL IMPACT OF ITS ACTIVITIES

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.

ASHRAE · 1791 Tullie Circle NE · Atlanta, GA 30329 · www.ashrae.org

About ASHRAE

ASHRAE, founded in 1894, is a global society advancing human well-being through sustainable technology for the built environment. The Society and its members focus on building systems, energy efficiency, indoor air quality, refrigeration, and sustainability. Through research, Standards writing, publishing, certification and continuing education, ASHRAE shapes tomorrow's built environment today.

For more information or to become a member of ASHRAE, visit www.ashrae.org.

To stay current with this and other ASHRAE Standards and Guidelines, visit www.ashrae.org/standards.

Visit the ASHRAE Bookstore

ASHRAE offers its Standards and Guidelines in print, as immediately downloadable PDFs, on CD-ROM, and via ASHRAE Digital Collections, which provides online access with automatic updates as well as historical versions of publications. Selected Standards and Guidelines are also offered in redline versions that indicate the changes made between the active Standard or Guideline and its previous version. For more information, visit the Standards and Guidelines section of the ASHRAE Bookstore at www.ashrae.org/bookstore.

IMPORTANT NOTICES ABOUT THIS STANDARD

To ensure that you have all of the approved addenda, errata, and interpretations for this Standard, visit www.ashrae.org/standards to download them free of charge.

Addenda, errata, and interpretations for ASHRAE Standards and Guidelines are no longer distributed with copies of the Standards and Guidelines. ASHRAE provides these addenda, errata, and interpretations only in electronic form to promote more sustainable use of resources.