ANSI/ASHRAE Addenda c, d, i, and p to
ANSI/ASHRAE Standard 62.1-2007

ASHRAE STANDARD

Ventilation for Acceptable Indoor Air Quality

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Addenda d and p

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Addenda c and i

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FOREWORD

This addendum adds a MERV 11 filtration requirement for systems located in areas where fine particulate matter (PM2.5) concentration exceeds the national standard or guideline. It also updates prescriptive requirements related to ozone air cleaning to reflect current EPA reporting of 8-hour averages, rather than previous EPA reporting of 1-hour averages. References to EPA sources for designers within the US have been clarified and detailed to increase the likelihood that all designers in a given location will use the same monitored data to make decisions related to outdoor air cleaning. An informative appendix has been added to provide information on national requirements, such as links to selected national standards or guidelines. The appendix also provides a list of areas within the U.S. where ozone filtration is required.

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 c to 62.1-2007

Revise Section 6.2.1.1 as follows:

6.2.1.1 Particulate Matter smaller than 10 micrometers (PM10). When the building is located in an area where the national standard or guideline for PM10[1] is exceeded, particle filters or air cleaning devices shall be provided to clean the outdoor air at any location prior to its introduction to occupied spaces. Particulate matter filters or air cleaners shall have a Minimum Efficiency Reporting Value (MERV) of 6 or higher when rated in accordance with ASHRAE Standard 52.2.[15]

Note: See Appendix XX for resources regarding selected PM10 national standards and guidelines.

Insert new Section 6.2.1.2 as follows:

6.2.1.2 Particulate Matter smaller than 2.5 micrometers (PM2.5). When the building is located in an area where the national standard or guideline for PM2.5[1] is exceeded, particle filters or air cleaning devices shall be provided to clean the outdoor air at any location prior to its introduction to occupied spaces. Particulate matter filters or air cleaners shall have a Minimum Efficiency Reporting Value (MERV) of 11 or higher when rated in accordance with ASHRAE Standard 52.2.[15]

Note: See Appendix XX for resources regarding selected PM2.5 national standards and guidelines.

Renumber existing Section 6.2.1.2 to be Section 6.2.1.3 and revise as follows:

6.2.1.3~~2~~ Ozone. Air-cleaning devices for ozone shall be provided when the most recent 3-year average annual fourth-highest daily maximum 8-hour average ozone concentration exceeds 0.107 ppm (209 µg/m^3) ~~second highest daily maximum one hour average concentration exceeds 0.160 ppm (313 µg/m^3). The ozone concentration for design purposes shall be determined in accordance with Appendix H to subchapter C, 40 CFR 50,[1] or equivalent.~~

Note: ~~Monitored values for historical one hour average ozone concentrations are available for United States locations at the AIRData Web site, located under www.epa.gov.~~ See Appendix XX for a list of United States locations exceeding the most recent 3-year average annual fourth-highest daily maximum 8-hour average ozone concentration of 0.107 ppm.

Such air-cleaning devices shall have a minimum volumetric ozone removal efficiency of 40% when installed, operated, and maintained in accordance with manufacturer recommendations and shall be approved by the authority having jurisdiction. Such devices shall be operated whenever outdoor ozone levels are expected to exceed 0.107 ppm (209 µg/m^3)~~0.160 ppm (313 µg/m^3)~~.

~~***Note:*** For United States locations, the one hour average ozone concentration is expected to exceed the 0.160 ppm (313 µg/m3) limit when the Air Quality Index forecast exceeds 151 (category red, purple, or maroon). This forecast is available in local media or at the AIRNow Web site, located under www.epa.gov.~~

Exceptions: Air cleaning for ozone is not required when:

a. The minimum system design outdoor air intake flow results in 1.5 air changes per hour or less.
b. Controls are provided that sense outdoor ozone level and reduce intake airflow to result in 1.5 air changes per hour or less while complying with the outdoor airflow requirements of Section 6.
c. Outdoor air is brought into the building and heated by direct-fired, makeup air units.

Renumber existing Section 6.2.1.3 to be Section 6.2.1.4.

Revise Section 9 as follows:

9. REFERENCES

[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 ~~July 1, 2004~~. U.S. Environmental Protection Agency. www.epa.gov/air/criteria.html, accessed June 20, 2008.~~June 25, 2005~~.

[15] *ANSI/ASHRAE Standard 52.2-2007-~~1999~~, Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size.* American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., Atlanta, GA.

Insert new informative Appendix as follows:

(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 XX
INFORMATION ON SELECTED NATIONAL STANDARDS AND GUIDELINES FOR PM10, PM 2.5 AND OZONE

TABLE XX-1 Information Sources for Identifying Non-Complying Locations (Information Current as of June 20, 2008)

Country	PM10	PM2.5	Ozone
United States	Find non-attainment areas at: http://epa.gov/air/airpollutants.html	Find non-attainment areas at: http://epa.gov/air/airpollutants.html	**ASHRAE 62.1-2007 air cleaning requirement**: See Table XX-2 for a list of U.S. locations exceeding the 0.107 level as of 06/20/08
Canada	National Building Code of Canada 2010—Part 6, HVAC www.nationalcodes.ca	National Building Code of Canada 2010—Part 6, HVAC www.nationalcodes.ca	National Building Code of Canada 2010—Part 6, HVAC www.nationalcodes.ca

TABLE XX-2 United States Locations Exceeding Design Value of 0.107 ppm for Ozone (Locations as of June 20, 2008)

State Name	County Name
California	Riverside
California	Kern
California	Los Angeles
California	San Bernardino

1. Design values for locations in the United States can be found at www.epa.gov/airtrends and by clicking at the Design Values tab. At the time of publication, this information could be found directly at http://www.epa.gov/air/airtrends/pdfs/dv_ozone_2004_2006.xls, column N of the Appendix tab.

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FOREWORD

This addendum addresses submitted change proposals, CM62.1-05-12-0002/001 and CM62.1-05-12-0003/001, and committee member suggested additions to Table 6-1.

- *Rates for "Kitchen (cooking)" have been added under the subheading "Food and Beverage Service".*
- *Rates for "Occupiable storage rooms for liquids or gels" have been added under "General."*
- *Rates for "Breakrooms" and "Occupiable storage rooms for dry materials" have been added under the subheading "Office Buildings". (This change reduces the likelihood that a storage room in an office building will be the critical ventilation zone.)*
- *Rates for "Banks or bank lobbies," "Sorting, packing, light assembly" and "General manufacturing (excludes heavy industrial and processes using chemicals)" have been added under the subheading "Miscellaneous Spaces."*
- *"Hydraulic elevator machine room" with Class 2 designation is added to Table 5-2.*
- *"Electrical equipment rooms" and "Elevator machine rooms" have been deleted from Table 6-1.*

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 d to 62.1-2007

Add the following to Table 5-2:

TABLE 5-2 Airstreams

Description	Air Class
Hydraulic elevator machine room	2

Revise Table 6-1 as follows (for brevity only modified lines of the table are included):

TABLE 6-1 Minimum Ventilation Rates in Breathing Zone

Occupancy Category	People Outdoor Air Rate, R_P		Area Outdoor Air Rate, R_A		Notes	Default Values			Air Class
						Occupant Density (see Note 4)	Combined Outdoor Air Rate (see Note 5)		
	cfm/person	L/s•person	cfm/ft^2	L/s•m^2		#/1000 ft^2 (#/100 m^2)	cfm/person	L/s•person	
Food and Beverage Service									
Kitchen (cooking)	7.5	3.8	0.12	0.6		20	14	7.0	2
General									
Occupiable storage rooms for liquids or gels	5	2.5	0.12	0.6	B	2	65	32.5	~~1~~2
Office Buildings									
Breakrooms	5	2.5	0.12	0.6		50	7	3.5	1
Occupiable storage rooms for dry materials	5	2.5	0.06	0.3		2	35	17.5	1
Miscellaneous Spaces									
Banks or bank lobbies	7.5	3.8	0.06	0.3		15	12	6.0	1
Sorting, packing, light assembly	7.5	3.8	0.12	0.6		7	25	12.5	2
General manufacturing (excludes heavy industrial and processes using chemicals)	10	5.0	0.18	0.9		7	36	18	3
~~Electrical equipment rooms~~	—	—	~~0.06~~	~~0.3~~	~~B~~	—	—	—	~~1~~
~~Elevator machine rooms~~	—	—	~~0.12~~	~~0.6~~	~~B~~	—	—	—	~~1~~

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FOREWORD

In response to comments received on previous drafts of 62.1i, this addendum deletes Section 6.2.9.

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 i to 62.1-2007

Delete existing Section 6.2.9:

~~**6.2.9** Ventilation in Smoking Areas. Smoking areas shall have more ventilation and/or air cleaning than comparable no-smoking areas. Specific ventilation rate requirements cannot be determined until cognizant authorities determine the concentration of smoke that achieves an acceptable level of risk. Air from smoking areas shall not be recirculated or transferred to no-smoking areas.~~

(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

This addendum addresses separation distance requirements between outdoor air intakes and other openings in buildings with respect to sources of contaminants and exhaust locations. To reduce the need for interpretation and judgment, building exhaust and relief airstreams are characterized using the Classes of Air already defined in the Standard rather than simple descriptions of the air quality.

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.

Revise Section 5.6.1and Table 5-1 as follows:

Addendum p to 62.1-2007

Note that Addendum a to 62.1-2007 (included in the 2008 Supplement) made changes to Section 5.6.1 and Table 5-1 in the published standard. The 2008 Supplement is available for free download from the ASHRAE website at http://www.ashrae.org/technology/page/132.

5.6.1 Location. Outdoor air intakes (including openings ~~doors and windows~~ that are required as part of a natural ventilation system) shall be located such that the shortest distance from the intake to any specific potential outdoor contaminant source shall be equal to or greater than the separation distance listed in Table 5-1.

Exception: Other minimum separation distances shall be permitted, provided it can be shown analytically that an equivalent or lesser rate of introduction of contaminants from outdoor sources~~outdoor air contaminants~~ will be attained**.**

Note: Appendix F presents an analytical method for determining the minimum separation distances based on dilution of outdoor contaminants.

TABLE 5-1 Air Intake Minimum Separation Distance

Object	Minimum Distance, ft (m)
Class 2 air exhaust/relief outlet (Note 1)	10 (3)
Class 3 air exhaust/relief outlet ~~Significantly contaminated exhaust~~ (Note 1)	15 (5)
Class 4 air exhaust/relief outlet ~~Noxious or dangerous exhaust~~ (Notes 2 ~~and 3~~)	30 (10)
Plumbing vents terminating less than 3 ft (1 m) above the level of the outdoor air intake	10 (3)
Plumbing vents terminating at least 3 ft (1 m) above the level of the outdoor air intake	3 (1)
Vents, chimneys, and flues from combustion appliances and equipment (Note 3~~4~~)	15 (5)
Garage entry, automobile loading area, or drive-in queue (Note 4~~5~~)	15 (5)
Truck loading area or dock, bus parking/idling area (Note 4~~5~~)	25 (7.5)
Driveway, street, or parking place (Note 4~~5~~)	5 (1.5)
Thoroughfare with high traffic volume	25 (7.5)
Roof, landscaped grade, or other surface directly below intake (Notes 5~~6~~ and 6~~7~~)	1 (0.30)
Garbage storage/pick-up area, dumpsters	15 (5)
Cooling tower intake or basin	15 (5)
Cooling tower exhaust	25 (7.5)

Note 1: This requirement applies to the distance from the outdoor air intakes for one ventilation system to the exhaust/relief outlets for any other ventilation system. ~~Significantly contaminated exhaust is exhaust air with significant contaminant concentration, significant sensory-irritation intensity, or offensive odor.~~

Note 2: Minimum distance listed does not apply to laboratory fume hood exhaust air outlets. Separation criteria for fume hood exhaust shall be in compliance with NFPA 45[3] and ANSI/AIHA Z9.5.[4]

~~Note 3: Noxious or dangerous exhaust is exhaust air with highly objectionable fumes or gases and/or exhaust air with potentially dangerous particles, bioaerosols, or gases at concentrations high enough to be considered harmful. Information on separation criteria for industrial environments can be found in the ACGIH Industrial Ventilation Manual[5] and in the *ASHRAE Handbook—HVAC Applications*.[6]~~

Note 3~~4~~: Shorter separation distances shall be permitted when determined in accordance with (a) ANSI Z223.1/NFPA 54[7] for fuel gas burning appliances and equipment; (b) NFPA 31[8] for oil burning appliances and equipment, or (c) NFPA 211[9] for other combustion appliances and equipment.

Note 4~~5~~: Distance measured to closest place that vehicle exhaust is likely to be located.

Note 5~~6~~: Shorter separation distances shall be permitted where outdoor surfaces are sloped more than 45 degrees from horizontal or are less than 1 in. (3 cm) wide.

Note 6~~7~~: Where snow accumulation is expected, the surface of the snow at the expected average snow depth constitutes the "other surface directly below intake."

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.