



ADDENDA

2015 Supplement

**ANSI/ASHRAE Addenda a, c, j, k, q, r, and s to
ANSI/ASHRAE Standard 62.1-2013**

Ventilation for Acceptable Indoor Air Quality

See Annex for approval dates.

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**ASHRAE Standing Standard Project Committee 62.1 for Addendum a
Cognizant TC: 4.3, Ventilation Requirements and Infiltration
SPLS Liaison: John F. Dunlap**

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Cognizant TC: TC 4.3, Ventilation Requirements and Infiltration
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ANSI/ASHRAE Standard 62.1-2013,
Ventilation for Acceptable Indoor Air Quality

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sleeping unit: a room or space in which people sleep that can also include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Such rooms and spaces that are also part of a dwelling unit are not sleeping units.

FOREWORD

Currently, ASHRAE Standard 62.1 has responsibility for multifamily residential buildings which are four stories or more, and ASHRAE Standard 62.2 has responsibility for residential buildings three stories and less. The ventilation rates for dwelling units in Standard 62.1 are different from the rates in Standard 62.2 and this inconsistency has caused concern for some. Additionally, Standard 62.1 does not address modest retrofits, whereas Standard 62.2 does. The retrofit market is a major user of ASHRAE ventilation standards. This addendum is a scope change that will do away with the building height threshold, bringing the dwelling units themselves into Standard 62.2 regardless of height, while common areas would be covered by Standard 62.1. The change will allow for consistency across dwelling units and also allow application of ASHRAE ventilation standards to the multifamily retrofit market.

A corresponding change to the scope of Standard 62.2 is also in process. These two scope changes must remain consistent with each other.

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

Addendum a to Standard 62.1-2013

Revise Section 2.1 as follows.

2. SCOPE

2.1 This standard applies to ~~all~~ spaces intended for human occupancy within buildings except those within dwelling units in residential occupancies in which occupants are non-transient, single-family houses, multi-family structures of three stories or fewer above grade, vehicles, and aircraft.

Add the following new definitions to Section 3. The remainder of Section 3 is unchanged.

3. DEFINITIONS

dwelling unit: a single unit providing complete, independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking, and sanitation.

nontransient: occupancy of a dwelling unit or sleeping unit for more than 30 days.

residential occupancies: occupancies that are not classified as institutional by the authority having jurisdiction and that also contain permanent provisions for sleeping.

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FOREWORD

ASHRAE Standard 62.1 contains requirements for ventilation of spaces that are free of environmental tobacco smoke (ETS). It also contains requirements for separation of an ETS-free area from any spaces containing ETS.

Since the current language relating to ETS was added to the standard, electronic smoking devices (commonly called “e-cigarettes”) have come on the market and are increasingly popular. Also, some jurisdictions have legalized the smoking of cannabis.

This addendum revises the current definition of ETS to include emissions from electronic smoking devices, as well as cannabis smoke. The existing requirements for separation of ETS-free spaces from ETS spaces remain unchanged.

This addendum clarifies the intent of the standard that provision of acceptable indoor air quality is incompatible with the presence of ETS, including cannabis smoke and e-cigarette emissions. The ventilation rates determined in accordance with the provisions of the standard apply only to spaces where these emissions are not present and that are adequately separated from spaces where they are present.

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 Standard 62.1-2013

Modify Section 3 as follows.

environmental tobacco smoke (ETS): the “aged” and diluted combination of both side-stream smoke (smoke from the lit end of a cigarette or other tobacco product) and exhaled mainstream smoke (smoke that is exhaled by a smoker). ETS is commonly referred to as *secondhand smoke*. This definition includes smoke produced from the combustion of cannabis and controlled substances and the emissions produced by electronic smoking devices.

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FOREWORD

This addendum adds requirements to the Indoor Air Quality Procedure (IAQP) for determining minimum ventilation rates by including consideration of the combined effects of multiple contaminants of concern on individual organ systems. This additive effect is already implicit in the Ventilation Rate Procedure. This change is intended to improve the IAQP by requiring consideration of these additive effects that are well established in the literature for many organ systems.

The change requires identifying those contaminants of concern that act on individual organs and identifying those contaminants as a "contaminant mixture of concern." A new calculation is provided for determining whether a particular ventilation rate maintains the concentration of the mixture within acceptable limits.

The addendum does not require that the list of contaminants of concern for a particular application be any different than it would be without the change, nor will the individual concentration limits for those contaminants be any different. The only change is to consider a combined concentration for the mixture rather than to consider each contaminant individually.

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 j to Standard 62.1-2013

Add the following definition to Section 3.

contaminant mixture: two or more contaminants that target the same organ system.

Revise Section 6.3 as follows (the remainder of Section 6.3 is unchanged).

6.3 Indoor Air Quality (IAQ) Procedure. Breathing zone outdoor airflow (V_{bz}) ~~and/or system outdoor air intake flow (V_{ot})~~ shall be determined in accordance with Sections 6.3.1 through 6.3.5.

6.3.1 Contaminant Sources. ~~Contaminants~~ Each contaminant of concern, or mixtures of concern for purposes of the design, shall be identified. For each contaminant of concern, indoor sources (e.g., occupants and materials) and outdoor sources shall be identified, and the emission rate for each contaminant of concern from each source shall be determined. Where two or more contaminants of concern target the same organ system, these contaminants shall be considered to be a contaminant mixture.

Note: Appendix B lists information for some potential contaminants of concern, including the organs they affect.

6.3.2 Contaminant Concentration. For each contaminant of concern, a concentration limit and its corresponding exposure period and an appropriate reference to a cognizant authority shall be specified. For each contaminant mixture of concern, the ratio of the concentration of each contaminant to its concentration limit shall be determined, and the sum of these ratios shall be no greater than one.

Exception: Consideration of odors in determining concentration limits is not required.

Notes:

- Odors are addressed in Section 6.3.4.2.
- Appendix B includes concentration guidelines for some potential contaminants of concern.

[. . .]

6.3.4.1 Mass Balance Analysis. Using a steady-state or dynamic mass-balance analysis, determine the minimum outdoor airflow rates required to achieve the concentration limits specified in Section 6.3.2 for each contaminant or contaminant mixture of concern within each zone served by the system.

Notes:

- Appendix D includes steady-state mass-balance equations that describe the impact of air cleaning on outdoor air and recirculation rates for ventilation systems serving a single zone.
- In the completed building, measurement of the concentration of contaminants or contaminant mixtures of concern may be useful as a means of checking the accuracy of the design mass-balance analysis, but such measurement is not required for compliance.

[. . .]

6.3.4.3 Similar Zone. The minimum outdoor airflow rates shall be no less than those found in accordance with Section 6.3.4.2 for a substantially similar zone (i.e., in a zone with identical contaminants and contaminant mixtures of concern, concentration limits, air cleaning efficiency, and specified level of acceptability; and with similar contaminant sources and emission rates).

6.3.5 Combined IAQ Procedure and Ventilation Rate Procedure. The IAQ procedure in conjunction with the Ventilation Rate Procedure may be applied to a zone or system. In this case, the Ventilation Rate Procedure shall be used to determine the required zone minimum outdoor airflow, and the IAQ Procedure shall be used to determine the additional outdoor air or air cleaning necessary to achieve the concentration limits of the contaminants and contaminant mixtures of concern.

Note: The improvement of indoor air quality through the use of air cleaning or provision of additional outdoor air in conjunction with minimum ventilation rates may be quantified using the IAQ procedure.

6.3.6 Documentation. When the IAQ Procedure is used, the following information shall be included in the design documentation: the contaminants and contaminant mixtures of concern considered in the design process, the sources and emission rates of the contaminants of concern, the concentra-

tion limits and exposure periods and the references for these limits, and the analytical approach used to determine ventilation rates and air cleaning requirements. The contaminant monitoring and occupant and/or visitor evaluation plans shall also be included in the documentation.

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FOREWORD

This addendum modifies the standard such that laboratory exhaust is assigned a default of Air Class 4, but explicitly allows a responsible EH&S professional to determine that a lower air class is appropriate for particular systems. If they assign a lower air class, then the use of heat wheel energy recovery would be allowed. The SSPC believes that determination of the appropriate air class is best made by a qualified professional on a case-by-case basis.

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

Addendum k to Standard 62.1-2013

Modify Table 5.16.1 as follows.

TABLE 5.16.1 Airstreams or Sources

Description	Air Class
Diazo printing equipment discharge	4
Commercial kitchen grease hoods	4
Commercial kitchen hoods other than grease	3
Laboratory hoods	4 ^a
Residential kitchen vented hoods	3
Hydraulic elevator machine room	2

a. Air Class 4 unless determined otherwise by the Environmental Health and Safety professional responsible to the owner or to the owner's designee

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FOREWORD

This addendum modifies Section 5.2, "Exhaust Duct Location," to clarify requirements by including air classes instead of descriptive language, and modifies the requirements by allowing positively pressurized exhaust ducts inside the space of origin.

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

Addendum q to Standard 62.1-2013

Revise Section 5.2 as shown below.

5.2 Exhaust Duct Location

5.2.1 Exhaust ducts that convey Class 4 air ~~potentially harmful contaminants~~ shall be negatively pressurized relative

to ducts, plenums or occupiable spaces through which the ducts they pass, ~~so that exhaust air cannot leak into occupied spaces; supply, return, or outdoor air ducts; or plenums.~~

5.2.2 Exhaust ducts under positive pressure that convey Class 2 or Class 3 air shall not extend through ducts, plenums or occupiable spaces other than the space from which the exhaust air is drawn.

Exception: Exhaust ducts conveying Class 2 air and exhaust ducts conveying air from residential kitchen hoods that are sealed in accordance with SMACNA Seal Class A.²

Revise Table 5.16.1 as shown below.

TABLE 5.16.1 Airstreams

Description	Air Class
Diazo printing equipment discharge	4
Commercial kitchen grease hoods	4
Commercial kitchen hoods other than grease	3
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Residential kitchen vented hoods	3
Hydraulic elevator machine room	2

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FOREWORD

This addendum deletes Sections 6.2.7.1.2 and 6.2.7.1.3, relating to demand control ventilation (DCV), and removes an informative note to Section 6.2.7.1.1. The deleted sections remove language that was potentially confusing; the essential requirement for DCV, as stated in Section 6.2.7.1.1, are retained. The changes remove the assumption that the standard is intended for use only as calculations for code review and not physical operation.

Changes to Section 5.9.2, "Exfiltration," clarify the requirements and extend them to apply under conditions of DCV control operation.

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

Addendum r to Standard 62.1-2013

Revise Section 5.9.2 as shown below.

5.9.2 Building Exfiltration. For a building, the ~~v~~ventilation system(s) for a building shall be designed to ensure that the ~~total building minimum~~ outdoor air intake equals or

exceeds the ~~total building maximum~~ exhaust under all load and dynamic reset conditions airflow.

Exceptions:

1. Where excess exhaust is required by process considerations and approved by the authority having jurisdiction, such as in certain industrial facilities.
2. When outdoor air dry-bulb temperature is below the indoor space dew-point design temperature.

Note: Although individual zones within a building may be neutral or negative with respect to outdoors or to other zones, net positive mechanical intake airflow for the building as a whole reduces infiltration of untreated outdoor air.

Revise Section 6.2.7.1.1 to delete the note as shown below.

6.2.7.1.1 The breathing zone outdoor airflow (V_{bz}) shall be reset in response to current occupancy and shall be no less than the building component ($R_a \times A_z$) of the DCV zone.

~~**Note:** Examples of reset methods or devices include population counters, carbon dioxide (CO₂) sensors, timers, occupancy schedules or occupancy sensors.~~

Delete Sections 6.2.7.1.2 and 6.2.7.1.3, and renumber 6.2.7.1.4.

~~**6.2.7.1.2** The ventilation system shall be controlled such that at steady state it provides each zone with no less than the breathing zone outdoor airflow (V_{bz}) for the current zone population.~~

~~**6.2.7.1.3** The current total outdoor air intake flow with respect to the coincident total exhaust airflow for the building shall comply with Section 5.9.2.~~

6.2.7.1.4 6.2.7.1.2 Documentation. [. . .]

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FOREWORD

This addendum modifies Table 6.5, "Minimum Exhaust Rates" to clarify confusing language related to locker and dressing rooms.

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Addendum s to Standard 62.1-2013

Modify Table 6.5 as follows.

TABLE 6.5 Minimum Exhaust Rates

Occupancy Category	Exhaust Rate, cfm/unit	Exhaust Rate, cfm/ft ²	Notes	Exhaust Rate, L/s-unit	Exhaust Rate, L/s-m ²	Air Class
[. . .]						
Locker/dressing rooms	—	0.25		—	1.25	2
Locker rooms	—	0.50		—	2.5	2
<u>Locker rooms for athletic, industrial and health care facilities</u>	—	<u>0.50</u>		—	<u>2.5</u>	<u>2</u>
<u>All other locker rooms</u>	—	<u>0.25</u>		—	<u>1.25</u>	<u>2</u>
<u>Shower rooms</u>	<u>20/50</u>		<u>G,I</u>	<u>10/25</u>		<u>2</u>
[. . .]						

Add Note I to Table 6.5.

[. . .]

G For continuous system operation, the lower rate may be used. Otherwise use the higher rate.

I Rate is per showerhead.

[. . .]

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INFORMATIVE ANNEX

18-MONTH SUPPLEMENT—ADDENDA TO ANSI/ASHRAE STANDARD 62.1-2013

This 18-month supplement includes Addenda a, c, j, k, q, r, and s to ANSI/ASHRAE Standard 62.1-2013. The following table lists each addendum and describes the way in which the standard is affected by the change. It also lists the ASHRAE and ANSI approval dates for each addendum.

Addendum	Section(s) Affected	Description of Changes*	Approval Dates: • Standards Committee • ASHRAE BOD • ANSI
a	2; 3	Currently, ASHRAE Standard 62.1 has responsibility for multifamily residential buildings that are four stories or more, and ASHRAE Standard 62.2 has responsibility for residential buildings three stories and less. The ventilation rates for dwelling units in Standard 62.1 are different from the rates in Standard 62.2, and this inconsistency has caused concern. Additionally, Standard 62.1 does not address modest retrofits, whereas Standard 62.2 does. The retrofit market is a major user of ASHRAE ventilation standards. This addendum is a scope change that will do away with the building height threshold, bringing the dwelling units themselves into Standard 62.2, regardless of height, while common areas would be covered by Standard 62.1. The change will allow for consistency across dwelling units and also allow application of ASHRAE ventilation standards to the multifamily retrofit market.	September 16, 2014 October 3, 2014 October 29, 2014
c	3	<p>Standard 62.1 contains requirements for ventilation of spaces which are free of environmental tobacco smoke (ETS-free). It also contains requirements for separation of an ETS-free area from any spaces containing environmental tobacco smoke.</p> <p>Since the current language relating to ETS was added to the standard, electronic smoking devices (commonly called <i>e-cigarettes</i>) have come on the market and are increasingly popular. Also, some jurisdictions have legalized the smoking of cannabis.</p> <p>This addendum revises the current definition of ETS to include emissions from electronic smoking devices and from smoking of cannabis. The existing requirements for separation of ETS-free spaces from ETS spaces remain unchanged.</p> <p>This addendum clarifies the intent of the standard that provision of acceptable indoor air quality is incompatible with the presence of ETS, including cannabis smoke and e-cigarette emissions. The ventilation rates determined in accordance with the provisions of the standard apply only to spaces where these emissions are not present that are adequately separated from spaces where they are present.</p>	January 28, 2015 January 28, 2015 (Technology Council) January 29, 2015

* These descriptions may not be complete and are provided for information only.

Addendum	Section(s) Affected	Description of Changes*	Approval Dates:
			<ul style="list-style-type: none"> • Standards Committee • ASHRAE BOD • ANSI
j	3; 6.3	<p>This addendum adds requirements to the Indoor Air Quality Procedure (IAQP) for determining minimum ventilation rates by including consideration of the combined effects of multiple contaminants of concern on individual organ systems. This additive effect is already implicit in the Ventilation Rate Procedure. The change is intended to improve the IAQP by requiring consideration of these additive effects that are well established in the literature for many organ systems.</p> <p>The change requires identifying those contaminants of concern that act on individual organs and identifying those contaminants as a “contaminant mixture of concern.” A new calculation is provided for determining whether a particular ventilation rate maintains the concentration of the mixture within acceptable limits.</p> <p>The addendum does not require that the list of contaminants of concern for a particular application be any different than it would be without the change, nor will the individual concentration limits for those contaminants be any different. The only change is to consider a combined concentration for the mixture rather than to consider each contaminant individually.</p>	September 26, 2013 November 8, 2013 December 5, 2013
k	Table 5.16.1	<p>This addendum modifies the standard such that laboratory exhaust is assigned a default of Air Class 4 but explicitly allows a responsible EH&S professional to determine that a lower air class is appropriate for particular systems. If they assign a lower air class, then the use of heat wheel energy recovery would be allowed. The SSPC believes that determination of the appropriate air class is best made by a qualified professional on a case-by-case basis.</p>	June 28, 2014 July 2, 2014 July 3, 2014
q	5.2; Table 5.16.1	<p>This addendum modifies Section 5.2, “Exhaust Duct Location,” to clarify requirements by including air classes instead of descriptive language, and modifies the requirements by allowing positively pressurized exhaust ducts inside the space of origin.</p>	January 28, 2015 January 28, 2015 (Technology Council) January 29, 2015
r	5.9.2; 6.2.7.1.1; 6.2.7.1.2; 6.2.7.1.3	<p>This addendum deletes Sections 6.2.7.1.2 and 6.2.7.1.3 relating to demand control ventilation (DCV) and removes an informative note to Section 6.2.7.1.1. The deleted sections remove language that was potentially confusing while retaining the essential requirement for DCV as stated in Section 6.2.7.1.1. The changes remove the assumption that the standard is intended for use only as calculations for code review and not physical operation.</p> <p>Changes to Section 5.9.2, “Exfiltration,” clarify the requirements and extend them to apply under conditions of DCV control operation.</p>	September 16, 2014 October 3, 2014 October 6, 2014
s	Table 6.5	<p>This addendum modifies Table 6.5, “Minimum Exhaust Rates,” to clarify confusing language related to locker and dressing rooms.</p>	January 18, 2014 January 22, 2014 January 23, 2014

* These descriptions may not be complete and are provided for information only.

NOTE

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

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.

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.

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