



ADDENDA

**ANSI/ASHRAE Addendum s to
ANSI/ASHRAE Standard 62.1-2016**

Ventilation for Acceptable Indoor Air Quality

Approved by the ASHRAE Standards Committee on June 22, 2019; by the ASHRAE Board of Directors on June 26, 2019; and by the American National Standards Institute on July 24, 2019.

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. Instructions for how to submit a change can be found on the ASHRAE® website (<https://www.ashrae.org/continuous-maintenance>).

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.

© 2019 ASHRAE

ISSN 1041-2336



ASHRAE Standing Standard Project Committee 62.1
Cognizant TC: 4.3, Ventilation Requirements and Infiltration
SPLS Liaison: Karl L. Peterman

Hoy R. Bohanon, Jr.*, <i>Chair</i>	Enrica Galasso	Lisa C. Ng
Jennifer A. Isenbeck*, <i>Co-Vice-Chair</i>	Elliott Gall	Daniel C. Pettway*
Wayne R. Thomann*, <i>Co-Vice-Chair</i>	Gregg Gress*	Stephen Ray*
Nick H. Agopian	Brian J. Hafendorfer*	Tom Rice
Hugo Aguilar	Nathan L. Ho*	Daniel J. Redmond*
Charlene W. Bayer	Elliott Horner*	Jeffrey K. Smith*
Lance R. Brown*	Eli P. Howard, III*	Erica Stewart*
Robin M. Bristol	Zalmie Hussein*	Drayton P. Stott
Tina M. Brueckner*	Jennifer Kane	Dean T. Tompkins
Brendon J. Burley*	Lauren MacGowens*	David Vigue
Abdel K. Darwich*	Stephany I. Mason	Donald Weekes, Jr.
James E. Dennison*	Meghan K. McNulty	Marwa Zaatari*
Henry W. Ernst, Jr.	Maria A. Menchaca Brandan	
Richard B. Fox	John Nelson, Jr.*	

* Denotes members of voting status when the document was approved for publication

ASHRAE STANDARDS COMMITTEE 2019–2020

Wayne H. Stoppelmoor, Jr., <i>Chair</i>	Susanna S. Hanson	Lawrence J. Schoen
Drury B. Crawley, <i>Vice-Chair</i>	Rick M. Heiden	Steven C. Sill
Els Baert	Jonathan Humble	Richard T. Swierczynna
Charles S. Barnaby	Srinivas Katipamula	Christian R. Taber
Niels Bidstrup	Essam E. Khalil	Russell C. Tharp
Robert B. Burkhead	Kwang Woo Kim	Adrienne G. Thomle
Thomas E. Cappellin	Larry Kouma	Michael W. Woodford
Douglas D. Fick	Cesar L. Lim	Craig P. Wray
Michael W. Gallagher	Karl L. Peterman	Jaap Hogeling, <i>BOD ExO</i>
Walter T. Grondzik	Erick A. Phelps	Malcolm D. Knight, <i>CO</i>

Steven C. Ferguson, *Senior Manager of Standards*

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

- interpretation of the contents of this Standard,
- participation in the next review of the Standard,
- offering constructive criticism for improving the Standard, or
- 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 objections on informative material are not offered the right to appeal at ASHRAE or ANSI.)

FOREWORD

The ventilation rate procedure in Standard 62.1-2016 contains requirements in notes. This addendum relocates requirements to the body of the standard. Another change clarifies that in the presence of unusual sources, the rates in the VRP must be supplemented by additional ventilation to be determined by the IAQ procedure or an EHS professional. The default values per person in Table 6.2.2.1, "Minimum Ventilation Rates in Breathing Zone," do not contain any adjustments for E_v , and, in many cases, are taken out of context. They are not used in the ventilation calculations. These values are deleted.

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 s to Standard 62.1-2016

Add a new definition in Section 3 as shown. The remainder of Section 3 is unchanged.

3. DEFINITIONS (SEE FIGURE 3.1)

unusual source: an item or activity that could create or emit contaminants that occurs rarely within an occupancy category.

Modify Section 6.1.1 as shown.

6.1.1 Ventilation Rate Procedure. The prescriptive design procedure presented in Section 6.2, in which outdoor air intake rates are determined based on space type/application, occupancy level, and floor area, shall be permitted to be used for any zone or system.

~~**Informative Note:** The Ventilation Rate Procedure minimum rates are based on contaminant sources and source strengths that are typical for the listed occupancy categories.~~

Modify Section 6.2.2.1 as shown. The current Section 6.2.2.1.1.2, "Laboratories," was added by Addendum w to 62.1-2016. Published addenda are free to download at <https://www.ashrae.org/technical-resources/standards-and-guidelines/standards-addenda>.

6.2.2.1 Breathing Zone Outdoor Airflow. The outdoor airflow required in the breathing zone (V_{bz}) of the occupiable space or spaces in a ventilation zone shall be not less than the value determined in accordance with Equation 6.2.2.1.

$$V_{bz} = R_p \times P_z + R_a \times A_z \quad (6.2.2.1)$$

where

A_z = zone floor area, the net occupiable floor area of the ventilation zone, ft² (m²)

P_z = zone population, the number of people in the ventilation zone during use

R_p = outdoor airflow rate required per person as determined from Table 6.2.2.1

Informative Note: These values are based on adapted occupants.

R_a = outdoor airflow rate required per unit area as determined from Table 6.2.2.1

Informative Notes:

1. Equation 6.2.2.1 accounts for people-related sources and area-related sources independently in the determination of the outdoor air rate required at the breathing zone. The use of Equation 6.2.2.1 in the context of this standard does not necessarily imply that simple addition of outdoor airflow rates for different sources can be applied to any other aspect of indoor air quality.
2. The rates in Table 6.2.2.1 are based on all other applicable requirements of this standard being met. If other requirements of the standard are not met, then the rates do not apply.

6.2.2.1.1 Unlisted Occupancy. Where the occupancy category for a proposed space or zone is not listed, the requirements for the listed occupancy category that is most similar in terms of occupant density, activities, and building construction shall be used.

6.2.2.1.2 Source Strengths. The Ventilation Rate Procedure minimum rates are based on contaminant sources and source strengths that are typical for the listed occupancy categories. Where unusual sources are expected, the additional ventilation or air cleaning required shall be calculated using Section 6.3.6 of the IAQ procedure or criteria established by the Environmental Health and Safety (EHS) professional responsible to the owner.

Informative Note:

1. Zones where emissions are expected from stored hazardous materials are not typical for any listed occupancy category.
2. Dry ice, theatrical smoke, and smoke-producing activities are not typical for any listed occupancy categories.

6.2.2.1.3 Air density. Volumetric airflow rates are based on dry air density of 0.075 lb_{da}/ft³ (1.2 kg_{da}/m³) at a barometric pressure of 1 atm (101.3 kPa) and an air temperature of 70°F (21°C). Rates shall be permitted to be adjusted for actual density.

6.2.2.1.4 Dwelling Units with Transient Occupancy. Air from one residential dwelling shall not be recirculated or transferred to any other space outside of that dwelling.

6.2.2.1.1.2.5 Laboratories. Laboratory spaces that comply with all requirements of ANSI/AIHA Z9.5⁶ are not required to comply with the rates in Table 6.2.2.1.

6.2.2.1.46 Design Zone Population. Design zone population (P_z) shall equal the largest (peak) number of people expected to occupy the ventilation zone during typical use.

Exceptions to 6.2.2.1.6:

1. Where the number of people expected to occupy the ventilation zone fluctuates, zone population equal to the average number of people shall be permitted, provided such average is determined in accordance with Section 6.2.6.2.
2. Where the largest or average number of people expected to occupy the ventilation zone cannot be established for a specific design, an estimated value for zone population shall be permitted, provided such value is the product of the net occupiable area of the ventilation zone and the default occupant density listed in Table 6.2.2.1.

6.2.2.1.6.1 Design Zone Population for Dwelling Units with Transient Occupancy. Default occupancy for dwelling units shall be two persons for studio and one-bedroom units, with one additional person for each additional bedroom.

Add new Section 6.2.5.1.3 as shown.

6.2.5.1.3 Other Ventilation Requirements. When a zone ventilation rate is obtained from criteria other than this standard, the ventilation rate shall be converted to cfm or L/s and the value added to V_{ou} for use in system design calculations.

Modify Section 6.2.7.1 as shown. The remainder of Section 6.2.7.1 is unchanged.

6.2.7.1 Demand Control Ventilation (DCV). DCV shall be permitted as an optional means of dynamic reset.

Exception to 6.2.7.1: CO₂-based DCV shall not be applied in zones with indoor sources of CO₂ other than occupants or with CO₂ removal mechanisms, such as gaseous air cleaners.

6.2.7.1.1 For DCV zones in the occupied mode, breathing zone outdoor airflow (V_{bz}) shall be reset in response to current population. Current population estimates used in DCV control calculations shall not result in ventilation rates that are less than those required by the actual population during any one-hour time period.

6.2.7.1.2 For DCV zones in the occupied mode, breathing zone outdoor airflow (V_{bz}) shall be not less than the building component ($R_a \times A_z$) for the zone.

Exception: 6.2.7.1.3 For DCV zones in the occupied stand-by mode, breathing zone outdoor airflow shall be permitted to be reduced to zero for zones in occupied stand-by mode for the occupancy categories indicated "OS" in Table 6.2.2.1, provided that airflow is restored to V_{bz} whenever occupancy is detected.

Modify Table 6.2.2.1 as shown.

TABLE 6.2.2.1 Minimum Ventilation Rates in Breathing Zone
(Table 6.2.2.1 shall be used in conjunction with the accompanying notes.)

Occupancy Category	People Outdoor Air Rate R_p		Area Outdoor Air Rate R_a		Notes	Default Values				
	cfm/person	L/s/person	cfm/ft ²	L/s·m ²		Occupant Density (see Note 4)	Combined-Outdoor-Air Rate (see Note 5)		Air Class	OS (6.2.7.1.3)
						#/1000 ft ² or #/100 m ²	cfm/person	L/s/person		
Correctional Facilities										
Cell	5	2.5	0.12	0.6		25	10	4.9	2	
Dayroom	5	2.5	0.06	0.3		30	7	3.5	1	
Guard stations	5	2.5	0.06	0.3		15	9	4.5	1	
Booking/waiting	7.5	3.8	0.06	0.3		50	9	4.4	2	
Educational Facilities										
Daycare (through age 4)	10	5	0.18	0.9		25	17	8.6	2	
Daycare sickroom	10	5	0.18	0.9		25	17	8.6	3	
Classrooms (ages 5–8)	10	5	0.12	0.6		25	15	7.4	1	
Classrooms (age 9 plus)	10	5	0.12	0.6		35	13	6.7	1	
Lecture classroom	7.5	3.8	0.06	0.3	H	65	8	4.3	1	X
Lecture hall (fixed seats)	7.5	3.8	0.06	0.3	H	150	8	4.0	1	X
Art classroom	10	5	0.18	0.9		20	19	9.5	2	
Science laboratories	10	5	0.18	0.9		25	17	8.6	2	
University/college laboratories	10	5	0.18	0.9		25	17	8.6	2	
Wood/metal shop	10	5	0.18	0.9		20	19	9.5	2	
Computer lab	10	5	0.12	0.6		25	15	7.4	1	
<u>Libraries</u>	<u>5</u>	<u>2.5</u>	<u>0.12</u>	<u>0.6</u>		<u>10</u>			<u>1</u>	
Media center	10	5	0.12	0.6	A	25	15	7.4	1	
Music/theater/dance	10	5	0.06	0.3	H	35	12	5.9	1	X
Multiuse assembly	7.5	3.8	0.06	0.3	H	100	8	4.1	1	X
Food and Beverage Service										
Restaurant dining rooms	7.5	3.8	0.18	0.9		70	10	5.1	2	
Cafeteria/fast-food dining	7.5	3.8	0.18	0.9		100	9	4.7	2	
Bars, cocktail lounges	7.5	3.8	0.18	0.9		100	9	4.7	2	
Kitchen (cooking)	7.5	3.8	0.12	0.6		20	14	7.0	2	

GENERAL NOTES FOR TABLE 6.2.2.1

- 1 Related requirements:** The rates in this table are based on all other applicable requirements of this standard being met.
- 2 Environmental Tobacco Smoke:** This table applies to ETS-free areas. Refer to Section 5.17 for requirements for buildings containing ETS areas and ETS-free areas.
- 3 Air density:** Volumetric airflow rates are based on dry air density of 0.075 lb_{da}/ft³ (1.2 kg_{da}/m³) at a barometric pressure of 1 atm (101.3 kPa) and an air temperature of 70°F (21°C). Rates shall be permitted to be adjusted for actual density.
- 4 Default occupant density:** The default occupant density shall be used where the actual occupant density is not known.
- 5 Default combined outdoor air rate (per person):** Rate is based on the default occupant density.
- 6 Unlisted occupancies:** Where the occupancy category for a proposed space or zone is not listed, the requirements for the listed occupancy category that is most similar in terms of occupant density, activities, and building construction shall be used.

ITEM-SPECIFIC NOTES FOR TABLE 6.2.2.1

- For high-school and college libraries, the values shown for “Public Assembly Spaces—Libraries” shall be used.
- Rate may not be sufficient where stored materials include those having potentially harmful emissions.
- Rate does not allow for humidity control. “Deck area” refers to the area surrounding the pool that is capable of being wetted during pool use or when the pool is occupied. Deck area that is not expected to be wetted shall be designated as an occupancy category.
- Rate does not include special exhaust for stage effects such as dry-ice vapors and smoke.
- Where combustion equipment is intended to be used on the playing surface or in the space, additional dilution ventilation, source control, or both shall be provided.
- Default occupancy for dwelling units shall be two persons for studio and one-bedroom units, with one additional person for each additional bedroom.
- Air from one residential dwelling shall not be recirculated or transferred to any other space outside of that dwelling.
- Ventilation air for this occupancy category shall be permitted to be reduced to zero when the space is in occupied-standby mode.

TABLE 6.2.2.1 Minimum Ventilation Rates in Breathing Zone (Continued)

(Table 6.2.2.1 shall be used in conjunction with the accompanying notes.)

Occupancy Category	People Outdoor Air Rate R_p		Area Outdoor Air Rate R_a		Notes	Default Values					
	cfm/person	L/s/person	cfm/ft ²	L/s/m ²		Occupant Density (see Note 4)	Combined Outdoor Air Rate (see Note 5)			Air Class	OS (6.2.7.1.3)
							#/1000 ft ² or #/100 m ²	cfm/person	L/s/person		
General											
Break rooms	5	2.5	0.06	0.3	H	25	7	3.5	1	X	
Coffee stations	5	2.5	0.06	0.3	H	20	8	4	1	X	
Conference/meeting	5	2.5	0.06	0.3	H	50	6	3.1	1	X	
Corridors	—	—	0.06	0.3	H	—	—	—	1	X	
Occupiable storage rooms for liquids or gels	5	2.5	0.12	0.6	B	2	65	32.5	2		
Hotels, Motels, Resorts, Dormitories											
Bedroom/living room	5	2.5	0.06	0.3	H	10	14	5.5	1	X	
Barracks sleeping areas	5	2.5	0.06	0.3	H	20	8	4.0	1	X	
Laundry rooms, central	5	2.5	0.12	0.6		10	17	8.5	2		
Laundry rooms within dwelling units	5	2.5	0.12	0.6		10	17	8.5	1		
Lobbies/prefunction	7.5	3.8	0.06	0.3	H	30	10	4.8	1	X	
Multipurpose assembly	5	2.5	0.06	0.3	H	120	6	2.8	1	X	
Office Buildings											
Breakrooms	5	2.5	0.12	0.6		50	7	3.5	1		
Main entry lobbies	5	2.5	0.06	0.3	H	10	14	5.5	1	X	
Occupiable storage rooms for dry materials	5	2.5	0.06	0.3		2	35	17.5	1		
Office space	5	2.5	0.06	0.3	H	5	17	8.5	1	X	
Reception areas	5	2.5	0.06	0.3	H	30	7	3.5	1	X	
Telephone/data entry	5	2.5	0.06	0.3	H	60	6	3.0	1	X	

GENERAL NOTES FOR TABLE 6.2.2.1

- 1 Related requirements:** The rates in this table are based on all other applicable requirements of this standard being met.
- 2 Environmental Tobacco Smoke:** This table applies to ETS-free areas. Refer to Section 5.17 for requirements for buildings containing ETS areas and ETS-free areas.
- 3 Air density:** Volumetric airflow rates are based on dry air density of 0.075 lb_{air}/ft³ (1.2 kg_{air}/m³) at a barometric pressure of 1 atm (101.3 kPa) and an air temperature of 70°F (21°C). Rates shall be permitted to be adjusted for actual density.
- 4 Default occupant density:** The default occupant density shall be used where the actual occupant density is not known.
- 5 Default combined outdoor air rate (per person):** Rate is based on the default occupant density.
- 6 Unlisted occupancies:** Where the occupancy category for a proposed space or zone is not listed, the requirements for the listed occupancy category that is most similar in terms of occupant density, activities, and building construction shall be used.

ITEM-SPECIFIC NOTES FOR TABLE 6.2.2.1

- For high-school and college libraries, the values shown for "Public Assembly Spaces—Libraries" shall be used.
- Rate may not be sufficient where stored materials include those having potentially harmful emissions.
- Rate does not allow for humidity control. "Deck area" refers to the area surrounding the pool that is capable of being wetted during pool use or when the pool is occupied. Deck area that is not expected to be wetted shall be designated as an occupancy category.
- Rate does not include special exhaust for stage effects such as dry-ice vapors and smoke.
- Where combustion equipment is intended to be used on the playing surface or in the space, additional dilution ventilation, source control, or both shall be provided.
- Default occupancy for dwelling units shall be two persons for studio and one-bedroom units, with one additional person for each additional bedroom.
- Air from one residential dwelling shall not be recirculated or transferred to any other space outside of that dwelling.
- Ventilation air for this occupancy category shall be permitted to be reduced to zero when the space is in occupied-standby mode.

TABLE 6.2.2.1 Minimum Ventilation Rates in Breathing Zone (Continued)

(Table 6.2.2.1 shall be used in conjunction with the accompanying notes.)

Occupancy Category	People Outdoor Air Rate		Area Outdoor Air Rate		Notes	Default Values				
	R_p		R_a			Occupant Density (see Note 4)	Combined Outdoor Air Rate (see Note 5)		Air Class	OS (6.2.7.1.3)
	cfm/person	L/s/person	cfm/ft ²	L/s/m ²		#/1000 ft ² or #/100 m ²	cfm/person	L/s/person		
Miscellaneous Spaces										
Bank vaults/safe deposit	5	2.5	0.06	0.3	H	5	17	8.5	2	X
Banks or bank lobbies	7.5	3.8	0.06	0.3	H	15	12	6.0	1	X
Computer (not printing)	5	2.5	0.06	0.3	H	4	20	10.0	1	X
Freezer and refrigerated spaces (<50°F)	10	5	0	0	E	0	0	0	2	
General manufacturing (excludes heavy industrial and processes using chemicals)	10	5.0	0.18	0.9		7	36	18	3	
Pharmacy (prep. area)	5	2.5	0.18	0.9		10	23	11.5	2	
Photo studios	5	2.5	0.12	0.6		10	17	8.5	1	
Shipping/receiving	10	5	0.12	0.6	B	2	70	35	2	
Sorting, packing, light assembly	7.5	3.8	0.12	0.6		7	25	12.5	2	
Telephone closets	—	—	0.00	0.0		—			1	
Transportation waiting	7.5	3.8	0.06	0.3	H	100	8	4.1	1	X
Warehouses	10	5	0.06	0.3	B	—			2	
Public Assembly Spaces										
Auditorium seating area	5	2.5	0.06	0.3	H	150	5	2.7	1	X
Places of religious worship	5	2.5	0.06	0.3	H	120	6	2.8	1	X
Courtrooms	5	2.5	0.06	0.3	H	70	6	2.9	1	X
Legislative chambers	5	2.5	0.06	0.3	H	50	6	3.1	1	X
Libraries	5	2.5	0.12	0.6		10	17	8.5	1	
Lobbies	5	2.5	0.06	0.3	H	150	5	2.7	1	X
Museums (children's)	7.5	3.8	0.12	0.6		40	11	5.3	1	
Museums/galleries	7.5	3.8	0.06	0.3	H	40	9	4.6	1	X

GENERAL NOTES FOR TABLE 6.2.2.1

- 1 Related requirements:** The rates in this table are based on all other applicable requirements of this standard being met.
- 2 Environmental Tobacco Smoke:** This table applies to ETS-free areas. Refer to Section 5.17 for requirements for buildings containing ETS areas and ETS-free areas.
- 3 Air density:** Volumetric airflow rates are based on dry air density of 0.075 lb_{da}/ft³ (1.2 kg_{da}/m³) at a barometric pressure of 1 atm (101.3 kPa) and an air temperature of 70°F (21°C). Rates shall be permitted to be adjusted for actual density.
- 4 Default occupant density:** The default occupant density shall be used where the actual occupant density is not known.
- 5 Default combined outdoor air rate (per person):** Rate is based on the default occupant density.
- 6 Unlisted occupancies:** Where the occupancy category for a proposed space or zone is not listed, the requirements for the listed occupancy category that is most similar in terms of occupant density, activities, and building construction shall be used.

ITEM SPECIFIC NOTES FOR TABLE 6.2.2.1

- For high-school and college libraries, the values shown for "Public Assembly Spaces—Libraries" shall be used.
- Rate may not be sufficient where stored materials include those having potentially harmful emissions.
- Rate does not allow for humidity control. "Deck area" refers to the area surrounding the pool that is capable of being wetted during pool use or when the pool is occupied. Deck area that is not expected to be wetted shall be designated as an occupancy category.
- Rate does not include special exhaust for stage effects such as dry ice vapors and smoke.
- Where combustion equipment is intended to be used on the playing surface or in the space, additional dilution ventilation, source control, or both shall be provided.
- Default occupancy for dwelling units shall be two persons for studio and one-bedroom units, with one additional person for each additional bedroom.
- Air from one residential dwelling shall not be recirculated or transferred to any other space outside of that dwelling.
- Ventilation air for this occupancy category shall be permitted to be reduced to zero when the space is in occupied standby mode.

TABLE 6.2.2.1 Minimum Ventilation Rates in Breathing Zone (Continued)

(Table 6.2.2.1 shall be used in conjunction with the accompanying notes.)

Occupancy Category	People Outdoor Air Rate R_p		Area Outdoor Air Rate R_a		Notes	Default Values				
	cfm/person	L/s/person	cfm/ft ²	L/s/m ²		Occupant Density (see Note 4)	Combined Outdoor Air Rate (see Note 5)		Air Class	OS (6.2.7.1.3)
						#/1000 ft ² or #/100 m ²	cfm/person	L/s/person		
Transient Residential										
Dwelling unit	5	2.5	0.06	0.3	F, G, H	F			1	X
Common corridors	—	—	0.06	0.3	H				1	X
Retail										
Sales (except as below)	7.5	3.8	0.12	0.6		15	16	7.8	2	
Mall common areas	7.5	3.8	0.06	0.3	H	40	9	4.6	1	X
Barbershop	7.5	3.8	0.06	0.3	H	25	10	5.0	2	X
Beauty and nail salons	20	10	0.12	0.6		25	25	12.4	2	
Pet shops (animal areas)	7.5	3.8	0.18	0.9		10	26	12.8	2	
Supermarket	7.5	3.8	0.06	0.3	H	8	15	7.6	1	X
Coin-operated laundries	7.5	3.8	0.12	0.6		20	14	7.0	2	
Sports and Entertainment										
Gym, sports arena (play area)	20	10	0.18	0.9	E	7	45	23	2	
Spectator areas	7.5	3.8	0.06	0.3	H	150	8	4.0	1	X
Swimming (pool & deck)	—	—	0.48	2.4	C	—			2	
Disco/dance floors	20	10	0.06	0.3	H	100	24	10.3	2	X
Health club/aerobics room	20	10	0.06	0.3		40	22	10.8	2	
Health club/weight rooms	20	10	0.06	0.3		10	26	13.0	2	
Bowling alley (seating)	10	5	0.12	0.6		40	13	6.5	1	
Gambling casinos	7.5	3.8	0.18	0.9		120	9	4.6	1	
Game arcades	7.5	3.8	0.18	0.9		20	17	8.3	1	
Stages, studios	10	5	0.06	0.3	D, H	70	14	5.4	1	X

GENERAL NOTES FOR TABLE 6.2.2.1

- 1 Related requirements:** The rates in this table are based on all other applicable requirements of this standard being met.
- 2 Environmental Tobacco Smoke:** This table applies to ETS-free areas. Refer to Section 5.17 for requirements for buildings containing ETS areas and ETS-free areas.
- 3 Air density:** Volumetric airflow rates are based on dry air density of 0.075 lb_{air}/ft³ (1.2 kg_{air}/m³) at a barometric pressure of 1 atm (101.3 kPa) and an air temperature of 70°F (21°C). Rates shall be permitted to be adjusted for actual density.
- 4 Default occupant density:** The default occupant density shall be used where the actual occupant density is not known.
- 5 Default combined outdoor air rate (per person):** Rate is based on the default occupant density.
- 6 Unlisted occupancies:** Where the occupancy category for a proposed space or zone is not listed, the requirements for the listed occupancy category that is most similar in terms of occupant density, activities, and building construction shall be used.

ITEM SPECIFIC NOTES FOR TABLE 6.2.2.1

- A** For high-school and college libraries, the values shown for “Public Assembly Spaces—Libraries” shall be used.
- B** Rate may not be sufficient where stored materials include those having potentially harmful emissions.
- C** Rate does not allow for humidity control. “Deck area” refers to the area surrounding the pool that is capable of being wetted during pool use or when the pool is occupied. Deck area that is not expected to be wetted shall be designated as an occupancy category.
- D** Rate does not include special exhaust for stage effects such as dry ice vapors and smoke.
- E** Where combustion equipment is intended to be used on the playing surface or in the space, additional dilution ventilation, source control, or both shall be provided.
- F** Default occupancy for dwelling units shall be two persons for studio and one-bedroom units, with one additional person for each additional bedroom.
- G** Air from one residential dwelling shall not be recirculated or transferred to any other space outside of that dwelling.
- H** Ventilation air for this occupancy category shall be permitted to be reduced to zero when the space is in occupied standby mode.

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.

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, 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.