ADDENDA

ANSI/ASHRAE/ASHE Addendum j to
ANSI/ASHRAE/ASHE Standard 170-2017

Ventilation of Health Care Facilities

Approved by ASHRAE Standards Committee on November 4, 2020; by the ASHRAE Board of Directors on November 18, 2020; by the American Society for Health Care Engineering on September 30, 2020; and by the American National Standards Institute on December 16, 2020.

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FOREWORD

Addendum j continues the process of reorganizing the standard into three components—Hospital, Outpatient, and Residential Health Care and Support—in alignment with the FGI Guidelines' transition to three separate standards. The intent is not to create additional requirements for outpatient or residential facilities but to separate these from hospital requirements and thus eliminate confusion over which requirements apply to which occupancies. The result will be clarification of a requisite level of requirements for outpatient and residential health facilities by separating these from the requirements of inpatient facilities.

This addendum comprises the entirety of Standard 179, Section 8, and incorporates previously published Addendum n. Generally, changes are as follows:

- *Refines the applicability of Table 8.1 to specialized outpatient facility types in coordination with* FGI Guidelines for Design and Construction of Hospitals and Outpatient Facilities
- *Incorporates new Table 8.2 to define ventilation requirements for General Outpatient Spaces, which includes offering an alternative compliance path modeled after Standard 62.1.*
- *Aligns content with Addendum a updated filtration requirements.*
- *Revises the space name terminology, table organization, and subheadings to better correlate with the* 2018 FGI Guidelines for Design and Construction of Hospitals and Outpatient Facilities. *For each space in the tables, the paragraph numbers of the relevant section of the FGI Guidelines is presented in italicized text as informative text for ease of user reference.*
- *Several spaces have relocated within the two Tables (Table 8.1 & Table 8.2). Table 8.1 and notes are reorganized into a new Table 8.1 and notes and new Table 8.2 and notes as shown; cyan highlighted spaces move to new Table 8.1 and notes and green highlighted spaces move to new Table 8.2 and notes, otherwise Table changes are shown in underline (new table) and strikethrough (old table).*

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 170-2017

Add the following new definition to Section 3 as shown. The remainder of Section 3 is unchanged.

facility: a discrete physical entity composed of various functional units as described in the FGI Guidelines.

Informative Note: This may be a portion of a building or a portion of a floor within a building.

Revise Section 8 as shown. Only changes are shown in underline and strikethrough.

8. SPACE VENTILATION—OUTPATIENT SPACES

The ventilation requirements of this standard are minimums that provide control of environmental comfort, asepsis, and odor in outpatient spaces. However, because they are minimum requirements and because of the diversity of the population and variations in susceptibility and sensitivity, these requirements do not provide assured protection from discomfort, airborne transmission of contagions, and odors.

8.1 ~~General Requirements.~~Specialized Outpatient Facility Requirements. The following facility types shall comply with this section: outpatient surgical, endoscopy, infusion, renal dialysis, freestanding emergency departments, and imaging facilities with Class 2 and 3 imaging rooms. The following general requirements shall apply for space ventilation:

a. Spaces shall be ventilated according to Table 8.1.

   1. Design of the ventilation system shall provide air movement that is generally from clean to less-clean areas. If any form of variable-air-volume or load-shedding system is used for energy conservation, it shall not compromise the pressure balancing relationships or the minimum air changes required by the table.

   2. The ventilation requirements in this table are intended to provide for comfort as well as for asepsis and odor control in spaces of a health care facility that directly affect patient care. For spaces not specifically listed here, ventilation requirements shall be that of functionally equivalent spaces in the table. If no functionally equivalent spaces exist in the table, ventilation requirements shall be obtained from ANSI/ASHRAE Standard 62.1 [1] in the absence of other codes or standards that govern those space ventilation rate requirements. Where spaces with prescribed rates in both Standard 62.1 and Table 8.1 of this standard exist, the higher of the two air change rates shall be used.

   3. For design purposes, the minimum number of total air changes indicated shall be either supplied for positive pressure rooms or exhausted for negative pressure rooms. Spaces that are required in Table 8.1 to be at a negative pressure relationship and ~~that~~ are not required to be exhausted shall ~~use~~ utilize the supply airflow rate to compute the minimum total air changes per hour required. For spaces that require a positive or negative pressure relationship, the number of air changes can be reduced when the space is unoccupied, provided that the required pressure relationship to adjoining spaces is maintained while the space is unoccupied and that the minimum number of air changes indicated is reestablished anytime the space becomes occupied. Controls intended to switch the required pressure relationships between spaces from positive to negative, and vice versa, shall not be permitted. Air change rates in excess of the minimum values are expected in some cases in order to maintain room temperature and design relative humidity conditions based on the space cooling or heating load. A night setback or unoccupied mode (to maintain a temperature range of 55°F to 85°F (13°C to 30°C) with a maximum of 65% design relative humidity) is permitted where pressurization is not required and where facilities are closed and unoccupied for blocks of time such as nights and weekends.

   4. The entire minimum outdoor air changes per hour required by Table 8.1 for the space shall meet the filtration requirements of Section 8.1.

   5. For spaces where Table 8.1 permits air to be recirculated by room units, the portion of the minimum total air changes per hour required for a space that is greater than the minimum outdoor air changes per hour required component may be provided by recirculating room HVAC units. Such recirculating room HVAC units shall

      i. not receive nonfiltered, nonconditioned outdoor air;

      ii. serve only a single space; and

      iii. provide a minimum MERV 6 filter for airflow passing over any surface that is designed to condense water. This filter shall be located upstream of any such cold surface, so that all of the air passing over the cold surface is filtered.

   6. For air-handling systems serving multiple spaces, system minimum outdoor air quantity shall be calculated using one of the following methods:

      i. System minimum outdoor air quantity for an air-handling system shall be calculated as the sum of the individual space requirements as defined by this standard.

      ii. System minimum outdoor air quantity shall be calculated by the Ventilation Rate Procedure (multiple zone formula) of ASHRAE Standard 62.1~~1~~. The minimum outdoor air change rate listed in this standard shall be interpreted as the *Voz* (zone out- door airflow) for purposes of this calculation.

b. Air filtration for spaces shall comply with Section 6.4 and Table 8.1.

c. Supply air outlets for spaces shall comply with Table 6.7.2.

d. In AII rooms, protective environment rooms, operating and procedure rooms, heating with supply air or radiant panels that meet the requirements of Section 6.5.3 shall be provided.

e. In a building that contains a mixture of spaces programmed for outpatient care as well as spaces programmed for inpatient care, the outpatient care spaces shall be designed in accordance with Table 8.1, and the inpatient care spaces shall be designed in accordance with Table 7.1.

Table 8.1 Design Parameters ~~for Outpatient-Specific Spaces~~—Specialized Outpatient Spaces

Function of Space (f)	Pressure Relationship to Adjacent Areas (n)	Minimum Outdoor ach	Minimum Total ach	All Room Air Exhausted Directly to Outdoors (j)	Air Recirculated by Means of Room Units (a)	Minimum Filter Efficiencies (c)	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
~~COMMON SPACES IN OUTPATIENT FACILITIES~~								
AII anteroom (i)~~ (3.1–3.4.3)~~	(e)	NR	10	Yes	No	~~7/~~NR	NR	NR
AII room (i)~~ (3.1–3.4.2)~~	Negative	2	12	Yes	No	~~7/~~NR	Max 60	70–75/21–24
Bronchoscopy~~, sputum collection, and pentamidine administration~~ (n)	Negative	2	12	Yes	No	~~7/~~NR	NR	68-73/20-23
Clean supply storage~~ (3.1–3.6.9)~~	Positive	2	4	NR	NR	~~7/~~NR	Max 60	72–78/22–26
~~Emergency~~ waiting~~ rooms~~	Negative	2	12	Yes (q)	NR	~~7/~~NR	Max. 65	70-75/21-24
Environmental services room~~ (3.1–5.5.1)~~	Negative	NR	10	Yes	No	~~7/~~NR	NR	NR
~~General purpose~~ examination/observation ~~room (3.1–3.2.2)~~	NR	2	4	NR	NR	~~7/~~NR	Max 60	70–75/21–24
Laboratory ~~testing~~/work~~ area if in a separate dedicated room (3.1–4.1.2)~~	Negative	2	6	Yes	NR	~~7/~~NR	NR	70–75/21–24
~~Medical~~ waste holding~~ spaces (3.1–5.4.1.3)~~	Negative	2	10	Yes	No	~~7/~~NR	NR	NR
Med~~ication preparation room programmed to compound sterile~~ prep~~arations~~ (b)~~ (3.1–3.6.6.2)~~	Positive	2	4	NR	NR	~~7/ HEPA (s)~~	NR	NR
Soiled holding ~~room (3.1–3.6.10)~~	Negative	2	6	Yes	No	~~7/~~NR	NR	72–78/22–26
Special~~ purpose~~ exam~~ination~~ room~~ (3.1–3.2.3)~~	~~NR~~	2	6	~~NR~~	NR	~~7/~~NR	Max 60	70–75/21–24
~~SPACES SPECIFIC TO PARTICULAR OUTPATIENT FACILITIES~~						~~7/~~NR		
Cancer treatment area~~ (p) (3.6–3.2)~~	NR	2	6	NR	NR	~~7/~~NR	Max 60	70–75/21–24
Diagnostic imaging waiting~~ area (3.5–6.1.3.2) (g)~~	Negative	2	12	Yes (q), (r)	NR	~~7/~~NR	Max 60	70–75/21–24
ECT procedure room~~ (p) (3.11–3.3.2.2)~~	NR	2	4	NR	NR	~~7/~~NR	~~Max 60~~	70–75/21–24
Endoscopy procedure room (h)~~ (3.9–3.2.2)~~	NR	2	6	NR	No	~~7/~~NR	Max 60	68–73/20–23
~~Freestanding~~ urgent care~~ facility procedure room (3.5–3.2.2)~~	Positive	2	~~6~~	NR	No	~~7/~~NR	NR	70–75/21–24
Instrument processing room~~ (3.9–5.1)~~	Negative	2	10	Yes	No	~~7/~~NR	NR	NR
~~Office-based procedure room (p) (3.8–3.1)~~	~~NR~~	~~2~~	~~4~~	~~NR~~	~~NR~~	~~7/NR~~	~~Max 60~~	~~70–75/21–24~~
~~Outpatient surgical facility~~ operating room (m), (o)~~ (3.7–3.3)~~	Positive	4	20	NR	No	~~7/14~~	20–60	68–75/20–24
~~Outpatient surgical facility~~ procedure room~~ (o),~~ (d)~~ (3.7–3.2)~~	Positive	3	15	NR	No	~~7/~~NR	20–60	70–75/21–24
~~Postoperative~~ recovery~~ area (3.7–3.4.3)~~	NR	2	6	NR	No	~~7/~~NR	Max 60	70–75/21–24
~~Postprocedure~~ recovery~~ area~~ (u)~~ (3.9–3.3)~~	NR	2	2	NR	NR	~~7/~~NR	Max 60	70–75/21–24
Preprocedure patient care~~ area~~ (t)~~ (3.9–3.3)~~	NR	2	2	NR	NR	~~7/~~NR	Max 60	70–75/21–24

Note: NR = no requirement

Table 8.1 Design Parameters—Specialized Outpatient Spaces

Function of Space (f)	Pressure Relationship to Adjacent Areas (n)	Minimum Outdoor ach	Minimum Total ach	All Room Air Exhausted Directly to Outdoors (j)	Air Recirculated by Means of Room Units (a)	Minimum Filter Efficiencies (c)	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
SURGERY AND EMERGENCY DEPT (ED)								
Delivery (Caesarean) (m), (o), (v) (gg), *(FGI 2.1–3.2.3)*	Positive	4	20	NR	No	16 (dd)	20–60	68–75/20–24
ED human decontamination *(FGI 2.8–3.4.8)*	Negative	2	12	Yes	No	14 (cc)	NR	NR
ED exam/treatment room (p) *(FGI 2.8–3.4.2)*	NR	2	6	NR	NR	14 (cc)	Max 60	70–75/21–24
ED public waiting area *(FGI 2.8–6.2.3)*	Negative	2	12	Yes (q)	NR	8	Max 65	70–75/21–24
Operating room (m), (o), (v), (gg) *(FGI 2.1–3.2.3)*	Positive	4	20	NR	No	16 (dd)	20–60	68–75/20–24
Procedure room (d), (o), (p) *(FGI 2.1–3.2.2)*	Positive	3	15	NR	No	14	20–60	70–75/21–24
Phase I recovery (PACU) *(FGI 2.1–3.7.4)*	NR	2	6	NR	No	8	Max 60	70–75/21–24
Phase II recovery (u) *(FGI 2.1–3.7.5)*	NR	2	2	NR	NR	8	Max 60	70–75/21–24
Pre-procedure patient care (t) *(FGI 2.1–3.7.3)*	NR	2	2	NR	NR	8	Max 60	70–75/21–24
Trauma room (crisis or shock) (bb) *(FGI 2.8–3.4.4)*	Positive	3	15	NR	No	14	20–60	70–75/21–24
Triage *(FGI 2.8–6.2.2.2 and 6.2.2.3)*	Negative	2	12	Yes (q)	NR	8	Max 60	70–75/21–24
DIAGNOSTIC AND TREATMENT								
Class 1 imaging room (ff) *(FGI 2.1–3.5.2.4(1)(b)(i))*	NR	2	6	NR	NR	8	Max 60	72–78/22–26
Class 2 imaging room (d), (p), (ff) *(FGI 2.1–3.5.2.4(1)(b)(ii))*	Positive	3	15	NR	No	14	20–60	70–75/21–24
Class 3 imaging room (m), (o), (ff) *(FGI 2.1–3.5.2.4(1)(b)(iii))*	Positive	4	20	NR	No	16 (dd)	20–60	68–75/20–24
Diagnostic imaging waiting (g) *(FGI 2.1–3.5.10.4)*	Negative	2	12	Yes (q), (r)	NR	8	Max 60	70–75/21–24
AII anteroom (i) *(FGI 2.1–3.3.2.3)*	(e)	NR	10	Yes	No	8	NR	NR
AII room (i) *(FGI 2.1–3.3.2)*	Negative	2	12	Yes	No	8	Max 60	70–75/21–24
PE anteroom (n) (w) *(FGI 1.2–4.2.2.1(1)*	(e)	NR	10	NR	No	HEPA	NR	NR
Protective environment room (n) (w) *(FGI 1.2–4.2.2.1(1)*	Positive	2	12	NR	No	HEPA	Max 60	70–75/21–24
Cancer treatment area *(FGI 2.6–3.1)*	NR	2	6	NR	NR	8	Max 60	70–75/21–24
Dialysis treatment area *(FGI 2.10–3.2)*	NR	2	6	NR	NR	8	NR	72–78/22–26
Dialyzer reprocessing room *(FGI 2.10–3.8.12)*	Negative	NR	10	Yes	No	8	NR	NR
Bronchoscopy (n) (x) *(FGI 2.1–3.2.2.1)*	Negative	2	12	Yes	No	14	NR	68–73/20–23
Instrument processing room *(FGI 2.1–4.3.2.3)*	Negative	2	10	Yes	No	8	NR	NR
Endoscopy procedure room (h) *(FGI 2.9–3.2)*	NR	2	6	NR	No	8	Max 60	68–73/20–23

Note: NR = no requirement

Table 8.1 Design Parameters—Specialized Outpatient Spaces

Function of Space (f)	Pressure Relationship to Adjacent Areas (n)	Minimum Outdoor ach	Minimum Total ach	All Room Air Exhausted Directly to Outdoors (j)	Air Recirculated by Means of Room Units (a)	Minimum Filter Efficiencies (c)	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
DIAGNOSTIC AND TREATMENT *(Continued)*								
Examination/observation *(FGI 2.1–3.2.1)*	NR	2	4	NR	NR	8	Max 60	70–75/21–24
Specialty IC exam room (y) *(FGI 2.1–3.2.1.3)*	Negative	2	6	Yes	NR	8	Max 60	70–75/21–24
Laboratory work room (z) *(FGI 2.1–4.1.2.1)*	Negative	2	6	Yes	NR	8	NR	70–75/21–24
Pharmacy/~~M~~med prep (b) *(FGI 2.1–3.8.8.2 and 2.1–4.2.2)*	Positive	2	4	NR	NR	8	NR	NR
Laser eye room *(FGI 2.1–3.2.2)*	NR	2	6	NR	No	8	Max 60	68–73/20–23
Nuclear medicine (see Section 8.7) *(FGI 2.1–3.5.7)*	Negative	2	6	Yes	No	8	NR	70–75/21–24
Toilet or Toilet/Shower room *(FGI 2.1–3.10.2)*	Negative	NR	10	Yes	No	8	NR	NR
STERILE PROCESSING (aa)								
One-room sterile processing *(FGI 2.1–4.3.2.3)*	NR	2	6	NR	No	14 (ee)	NR	NR
Sterilizer equipment room *(FGI 2.1–4.3.2.2)*	Negative	NR	10	Yes	No	8	NR	NR
Clean workroom *(FGI 2.1–4.3.2.2.3)*	Positive	2	4	NR	No	14 (ee)	Max 60	60–73/16–23
Clean supply storage *(FGI 2.1–4.3.2.2.4)*	Positive	2	4	NR	NR	14 (ee)	Max 60	72–78/22–26
Supply receiving *(FGI 2.1–4.3.2.4)*	Negative	NR	10	Yes	No	8	NR	NR
Decontamination room *(FGI 2.1–4.3.2.2)*	Negative	2	6	Yes	No	8	NR	60–73/16–23
SERVICE/SUPPORT SPACE								
Environmental services room *(FGI 2.1–5.3.1)*	Negative	NR	10	Yes	No	8	NR	NR
Laundry/linen processing *(FGI 2.1–4.4.2.1)*	Negative	2	10	Yes	No	8	NR	NR
Clean workroom or clean supply *(FGI 2.1–3.8.11)*	Positive	2	4	NR	NR	8	NR	NR
Regulated waste holding *(FGI 2.1–5.2.1.3)*	Negative	2	10	Yes	No	8	NR	NR
Soiled workroom or soiled holding *(FGI 2.1–3.8.12)*	Negative	2	6	Yes	No	8	NR	72–78/22–26

Note: NR = no requirement

Normative Notes for Table 8.1:

a. Except where indicated by a "No" in this column, recirculating room HVAC units (with heating or cooling coils) are acceptable for providing that portion of the minimum total air changes per hour that is permitted by Section 8.1 (subparagraph [a][5]). Because of the cleaning difficulty and potential for buildup of contamination, recirculating room units shall not be used in areas marked "No." Recirculating devices with high-efficiency particulate air (HEPA) filters shall be permitted in existing facilities as interim, supplemental environmental controls to meet requirements for the control of airborne infectious agents. The design of either portable or fixed systems should prevent stagnation and short circuiting of airflow. The design of such systems shall also allow for easy access for scheduled preventative maintenance and cleaning.

b. Pharmacy compounding areas may have additional air change, differential pressure, and filtering requirements beyond the minimum of this table, depending on the type of pharmacy, the regulatory requirements (which may include adoption of USP 795, *General Pharmacy/Nonsterile Preparations*; USP 797, *Sterile Compounding*; and USP 800, *Hazardous Drugs Toxins*), the associated level of risk of the work, and the equipment used in the spaces. **(*Informative Notes:*** ~~See USP (2012) in Appendix B.~~[1] See USP 2017a and 2017b in Appendix B. [2] Hazardous drug sterile compounding follows USP 797 and then applies USP 800 as an overlay of requirements (e.g., hazardous drug storage follows USP 800 only.)

c. Table entries are the minimum filter efficiencies required for the space. Refer to Section 6.4 of this document for further clarification of filtration requirements. ~~The first table entry is the minimum filter efficiency for Filter Bank No. 1. The second table entry (after the slash) is the minimum filter efficiency for Filter Bank No. 2. The minimum efficiency reporting value (MERV) is based on the method of testing described in ANSI/ASHRAE Standard 52.2 ***Informative Note:*** See ASHRAE [2012] in Appendix B.~~The minimum efficiency reporting value (MERV) is based on the method of testing described in ANSI/ASHRAE Standard 52.2, *Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size*. (***Informative Note:*** See ASHRAE [2012] in Appendix B.)

d. Pressure relationships need not be maintained when the room is unoccupied.

e. See Section ~~8.2~~7.2.1 and its subsections for ventilation requirements, including pressure relationship requirements.

f. Parenthetic notations following a space name are paragraph references to the ~~2014~~2018 Facility Guidelines Institute document *Guidelines for Design and Construction of Hospitals and Outpatient Facilities* (***Informative Note:*** FGI [~~2014~~2018]). These FGI paragraph references are provided to the user of the standard to aid in the application of design requirements.

g. These ventilation requirements only apply to ~~urgent care facility~~ waiting areas where the ICRA determines that the diagnostic imaging waiting area requires special consideration to reduce the risk of airborne infection transmission. If the ICRA does not have these special consideration provisions then the ventilation requirements shall meet the provisions of ANSI/ASHRAE Standard 62.1.

h. If the planned space is designated in the organization's operational plan to be used for both bronchoscopy and gastrointestinal endoscopy, the design parameters for "bronchoscopy, sputum collection, and pentamidine administration" shall be used.

i. The AII room described in this standard shall be used for isolating the airborne spread of infectious diseases, such as measles, varicella, or tuberculosis. Supplemental recirculating devices using HEPA filters shall be permitted in the AII room to increase the equivalent room air exchanges; however, the minimum outdoor air changes of Table 8.1 are still required. When the AII room is not used for airborne infection isolation, the pressure relationship to adjacent areas, when measured with the door closed, shall remain unchanged, and the minimum total air change rate shall be 6 ach.

j. In some areas with potential contamination and/or odor problems, exhaust air shall be discharged directly to the outdoors and not recirculated to other areas. Individual circumstances may require special consideration for air exhausted to the outdoors. To satisfy exhaust needs, constant replacement air from the outdoors is necessary when the system is in operation.

k. The RH ranges listed are the minimum and/or maximum allowable at any point within the design temperature range required for that space.

l. Systems shall be capable of maintaining the rooms within the range during normal operation. Lower or higher temperature shall be permitted when patients' comfort and/or medical conditions require those conditions.

m. National Institute for Occupational Safety and Health (NIOSH) criteria documents regarding occupational exposure to waste anesthetic gases and vapors and control of occupational exposure to nitrous oxide indicate a need for both local exhaust (scavenging) systems and general ventilation of the areas in which the respective gases are used. Refer to NFPA 99 for other requirements.

n. If pressure-monitoring device alarms are installed, allowances shall be made to prevent nuisance alarms. Short-term excursions from required pressure relationships shall be allowed while doors are moving or temporarily open. Simple visual methods such as smoke trail, ball-in-tube, or flutterstrip shall be permitted for verification of airflow direction.

o. Surgeons or surgical procedures may require room temperatures, ventilation rates, humidity ranges, and/or air distribution methods that exceed the minimum indicated ranges.

Normative Notes for Table 8.1 (continued):

p. Treatment or procedure rooms used for bronchoscopy shall be treated as bronchoscopy rooms. Treatment or procedure rooms used for procedures with nitrous oxide shall contain provisions for exhausting anesthetic waste gases.

q. In a recirculating ventilation system, HEPA filters shall be permitted instead of exhausting the air from these spaces to the outdoors, provided that the return air passes through the HEPA filters before it is introduced into any other spaces. The entire minimum total air changes per hour of recirculating airflow shall pass through HEPA filters. When these areas are open to larger, nonwaiting spaces, the exhaust air volume shall be calculated based on the seating area of the waiting area. (***Informative Note:*** The intent here is to not require the volume calculation to include a very large space [(e.g., an atrium)] just because a waiting area opens onto it.)

r. The requirement that all room air be exhausted directly to outdoors applies only to radiology waiting rooms programmed to hold patients who are waiting for chest x-rays for diagnosis of respiratory disease.

s. As an alternative to the requirement for HEPA filters in Filter Bank No. 2, MERV-14 rated filters may be used in Filter Bank No. 2 if a tertiary terminal HEPA filter is provided for this space. High-efficiency particulate air (HEPA) filters are those filters that remove at least 99.97% of 0.3 micron-sized particles at the rated flow in accordance with the testing methods of IEST RP-CC001.3 (***Informative Note:*** See IEST [2005] in Appendix B.)

t. If anesthetic gases are administered in the area, the minimum total air changes shall be increased to 6.

u. If anesthetic gases are used during the preceding procedure, the minimum total air changes shall be increased to 6.

v. See Section 7.4.1 for ventilation requirements. The “Operating Room” designation includes surgical cystoscopic rooms.

w. See Section 7.2.2 for ventilation requirements.

x. This space includes sputum collection and pentamidine administration. See Section 8.5.2.

y. Examination rooms (identified as “Specialty infection control-IC exam rooms”) programmed for use by patients with undiagnosed gastrointestinal symptoms, undiagnosed respiratory symptoms, or undiagnosed skin symptoms.

z. This room is intended for basic blood and urine specimen testing and short-term storage only. Outpatient facilities that provide the following specialized service spaces/rooms should consult Table 7.1 of this standard for ventilation requirements: laboratory work areas, including the specialty lab services such as bacteriology, biochemistry, cytology, glasswashing, histology, media transfer, microbiology, nuclear medicine, pathology, serology and/or sterilizing.

aa. See AAMI Standard ST79 11 for additional information for these spaces.

bb. The term “trauma room,” as used herein, is a first-aid room and/or emergency department room used for general initial treatment of accident victims. The operating room (OR) within the trauma center that is routinely used for emergency surgery is considered to be an OR by this standard.

cc. A minimum MERV-A-8 filter may be utilized for this space in lieu of a minimum MERV-A-14 filter if all room air is exhausted directly to the outdoors and the pressure relationship to adjacent areas is kept negative. If a filter rated less than MERV-A-14 is utilized, the space shall be considered “Negative,” with regards to the table, and must comply with all other requirements for negative spaces within the standard.

dd. See section 7.4.1(c).

ee. Minimum MERV-A-14 filters shall be required for spaces where sterile equipment is packed into sterile packages. MERV-A-8 filters may be used in place of MERV-A-14 in spaces where sterile products are stored in sealed packaging but are not opened or otherwise handled outside of the sealed package.

ff. The facility governing body shall inform design engineers relating to room function or use (which function is applicable) for Class 1, Class 2 or Class 3 imaging rooms.

gg. As an exception to the standard, alternative ventilation is allowed that provides a fan mounted in a mechanical space outside the room that supplies air through a HEPA filter to the ceiling diffuser.

8.2 General Outpatient Facility Requirements. All outpatient facility types other than those indicated in Section 8.1 shall comply with this Section and Table 8.2.

Unless otherwise noted in this section, all requirements for space ventilation of general outpatient spaces are contained within this section and Table 8.2, and Sections 6, 7, 9, and 10 of this standard shall not apply. For requirements related to Sections 6 and 10, which are not found in this section, refer to local and state building codes. Where no local or state code is recognized, the requirements of ANSI/ASHRAE Standard 62.1[1] shall apply.

Informative Note: ASHRAE recognizes that ASHRAE standards are typically the foundation of state and local building codes. However, state and local codes also represent important regional interests and conditions. As such, state and local building codes shall also be followed to the maximum extent practicable.

The following requirements shall apply for space ventilation:

a. Spaces shall be ventilated according to Table 8.2.
   1. Design of the ventilation system shall provide air movement that is generally from clean to less-clean areas. If any form of variable-air-volume or load-shedding system is used for energy conservation, it shall not compromise the pressure balancing relationships or the minimum air changes required by the table.
   2. The ventilation rates in this table are intended to provide for comfort as well as for asepsis and odor control in spaces of a health care facility that directly affect patient care. Ventilation rates for clinical spaces not specified here shall be that of functionally equivalent spaces in the table. If no functionally equivalent spaces exist in the table, ventilation requirements shall be obtained from ANSI/ASHRAE Standard 62.1[1]. Where spaces with prescribed rates in both Standard 62.1 and Table 8.2 of this standard exist, the higher of the two air change rates shall be used.
   3. For design purposes, pressure relationships shall be achieved by the following methods:
      i. Spaces that require a positive or negative pressure relationship shall maintain the required pressure relationship during room occupied hours.
      ii. For systems utilizing air changes per hour, the minimum number of total air changes indicated shall be either supplied for positive pressure rooms or exhausted for negative pressure rooms. For spaces that require a positive or negative pressure relationship, the number of air changes can be reduced when the space is unoccupied, provided that the required pressure relationship to adjoining spaces is maintained while the space is unoccupied and that the minimum number of air changes indicated is reestablished anytime the space becomes occupied. Controls intended to switch the required pressure relationships between spaces from positive to negative, and vice versa, shall not be permitted. Air change rates in excess of the minimum values are expected in some cases in order to maintain room temperature and design relative humidity conditions based on the space cooling or heating load.
   4. All ventilation required by Table 8.2 shall meet the filtration requirements of Section 6.4 and Section 8.2.
   5. For spaces where Table 8.2 permits air to be recirculated by room units, the portion of the minimum total air changes per hour required for a space that is greater than the minimum outdoor air changes per hour required component may be provided by recirculating room HVAC units. Such recirculating room HVAC units shall
      i. not receive nonfiltered, nonconditioned outdoor air;
      ii. provide the manufacturer's recommended filter (or MERV-A-8 as a minimum) for airflow passing over any surface that is designed to condense water. This filter shall be located upstream of any such cold surface, so that all of the air passing over the cold surface is filtered.
   6. For air-handling systems utilizing the cfm/person and cfm/ft^2 outdoor air ventilation rates, system minimum outdoor air quantity shall be calculated by the Ventilation Rate Procedure of ASHRAE Standard 62.1[1]. The cfm/person rate shall be considered the R_p value, and the cfm/ft^2 rate shall be considered the R_a value in the calculation.
      i. The minimum space population is provided as a required minimum in the "R_p" column of Table 8.2. The design zone population (P_z) shall equal the largest (peak) number of people expected to occupy the room/space during typical use. When the

design zone population is less than the space population, use the minimum space population.

ii. A zone minimum primary airflow (for multiple-zone recirculating systems) shall be provided as follows: For each zone, the minimum primary airflow ($V_{pz\text{-}min}$) shall be determined by the equation $V_{pz\text{-}min} = V_{oz} \times 1.5$

7. For air-handling systems serving multiple spaces and utilizing the "Minimum Outdoor ach" column, system minimum outdoor air quantity shall be calculated using one of the following methods:
   i. System minimum outdoor air quantity for an air-handling system shall be calculated as the sum of the individual space requirements as defined by this standard.
   ii. System minimum outdoor air quantity shall be calculated by the Ventilation Rate Procedure (multiple zone formula) of ASHRAE Standard 62.1[1]. The minimum outdoor air change rate listed in this standard shall be interpreted as the zone outdoor airflow (V_{oz}) for purposes of this calculation.
8. In lieu of calculating ventilation via air change rate (ach), an optional path allows calculating ventilation rate using provided values for cfm/person (R_p) and cfm/ft^2 area (R_a) and air class. This alternative design path option excludes compliance with the space total air change rate (ach) requirement. This alternative design path option is *only* applicable to Table 8.2 spaces. (***Informative Note:*** There is no correlation expected or intended between the two design path options.)
9. A night setback or unoccupied mode (to maintain a temperature range of 55°F to 85°F (13°C to 30°C) with a maximum of 65% design relative humidity) is permitted where pressurization is not required and where facilities are closed and unoccupied for blocks of time such as nights and weekends.

~~8.2~~ 8.3 Additional Room-Specific Requirements

~~8.2.1~~ 8.3.1 Airborne Infection Isolation (AII) Rooms. Refer to Section 7.2.1 of this standard. ~~Ventilation for AII rooms shall meet the following requirements whenever an infectious patient occupies the room:~~

~~a. Each AII room shall comply with requirements of Tables 6.4, 6.7.2, and 8.1. AII rooms shall have a permanently installed device and/or mechanism to constantly monitor the differential air pressure between the room (when occupied by patients with a suspected airborne infectious dis- ease) and the corridor, whether or not there is an anteroom. A local visual means shall be provided to indicate when- ever negative differential pressure is not maintained.~~

~~b. All air from the AII room shall be exhausted directly to the outdoors.~~

~~**Exception to 8.2.1(b):** AII rooms that are retrofitted from standard patient rooms from which it is impractical to exhaust directly outdoors may be provided with recirculated air from the room's exhaust on the condition that the air first passes through a HEPA filter.~~

~~c. All exhaust air from the AII rooms, associated anterooms, and associated toilet rooms shall be discharged directly to the outdoors without mixing with exhaust air from any other non-AII room or exhaust system.~~

~~d. Exhaust air grilles or registers in the patient room shall be located directly above the patient bed, on the ceiling or on the wall near the head of the bed, unless it can be demonstrated that such a location is not practical.~~

~~e. The room envelope shall be sealed to provide a minimum differential pressure of 0.01 in. of water (2.5 Pa) across the envelope.~~

~~f. Differential pressure between AII rooms and adjacent spaces that are not AII rooms shall be a minimum of 0.01 in. of water (2.5 Pa). Spaces such as the toilet room and the anteroom (if present) that are directly associated with the AII room and open directly into the AII room are not required to be designed with a minimum pressure difference from the AII room but are still required to maintain the pressure relationships to adjacent areas specified in Table 8.1.~~

~~g. When an anteroom is provided, the pressure relationships shall be as follows: (1) the AII room shall be at a negative pressure with respect to the anteroom, and (2) the ante room shall be at a negative pressure with respect to the corridor.~~

8.3.2 Protective Environment (PE) Rooms. Refer to Section 7.2.2 of this standard.

~~8.3~~ 8.4 Surgery Rooms

~~8.3.1~~ 8.4.1 Operating Rooms, Operating/Surgical Cystoscopic Rooms, and Caesarean Delivery Rooms. Refer to Section 7.4.1 of this standard. ~~These rooms shall be maintained at a positive pressure with respect to all adjoining spaces at all times. A pressure differential shall be maintained at a value of at least +0.01 in. wc (2.5 Pa). Each room shall have individual temperature control. These rooms shall be provided with a primary supply diffuser array that is designed as follows:~~

~~a. The airflow shall be unidirectional, downwards, and the average velocity of the diffusers shall be 25 to 35 cfm/ft2 (127 to 178 L/s/m2). The diffusers shall be concentrated to provide an airflow pattern over the patient and surgical team. ***Informative Note:*** For more information, see Memarzadeh and Manning (2002) and Memarzadeh and Jiang (2004) in Appendix B.~~

~~b. The coverage area of the primary supply diffuser array shall extend a minimum of 12 in. (305 mm) beyond the footprint of the surgical table on each side. Within the portion of the primary supply diffuser array that consists of an area encompassing 12 in. (305 mm) on each side of the footprint of the surgical table, no more than 30% of this portion of the primary supply diffuser array area shall be used for nondiffuser uses such as lights, gas columns, equipment booms, access panels, sprinklers, etc.~~

~~Additional supply diffusers shall be permitted within the room, outside of the primary supply diffuser array, to provide additional ventilation to the operating room to achieve the environmental requirements of Table 8.1 that relate to temperature, humidity, or a portion of the required air change rates.~~

~~The room shall be provided with at least two low side wall return or exhaust grilles spaced at opposite corners or as far apart as possible, with the bottom of these grilles installed approximately 8 in. (203 mm) above the floor.~~

~~**Exception to 8.3.1:** In addition to the required low return (or exhaust) air grilles, such grilles may be placed high on the walls.~~

~~8.3.2~~ 8.4.2 Sterilization Rooms. Steam that escapes from a steam sterilizer shall be exhausted using an exhaust hood or other suitable means. Ethylene oxide that escapes from a gas sterilizer shall be exhausted using an exhaust hood or other suitable means.

~~**8.3.3 Imaging Procedure Rooms.** If invasive procedures occur in this type of room, ventilation shall be provided in accordance with the ventilation requirements for procedure rooms. If anesthetic gases are administered, ventilation shall be provided in accordance with the ventilation requirements for operating rooms.~~

~~8.4~~ 8.5 Support Spaces

~~8.4.1~~ 8.5.1 Nonrefrigerated Body-Holding Rooms. This space type is not listed in Tables 8.1 or 8.2; however, the following specific functional elements are relative to any facility with a body-holding room. A nonrefrigerated body-holding room is applicable only to facilities that do not perform autopsies on site and use the space for short periods while waiting for the body to be transferred. Ventilation for nonrefrigerated body-holding rooms shall meet the following requirements:

a. All exhaust air from nonrefrigerated body holding rooms shall be discharged directly to the outdoors without mixing with air from any other room or exhaust system.

~~8.4.2~~ 8.5.2 Bronchoscopy

a. Differential pressure between bronchoscopy procedure and sputum induction rooms and any adjacent spaces that have other functions shall be a minimum of –0.01 in. of water (–2.5Pa).
b. Local exhaust shall be provided for sputum collection procedures.

8.5.3 Medical/Anesthesia Gas Storage Rooms. Ventilation for medical/anesthesia gas storage rooms shall comply with NFPA 99[10].

~~8.5~~ 8.6 Psychiatric Patient Areas. All exposed equipment located with these spaces shall have enclosures with rounded corners and tamper-resistant fasteners. With the exception of HVAC room recirculating units, equipment shall be arranged such that maintenance personnel are not required to enter patient-care spaces for service.

8.7 Nuclear Medicine. Refer to Table 8.1 of this standard for both nuclear medicine treatment spaces and nuclear medicine hot-lab spaces when radiopharmaceutical preparation is performed on site (not premixed) and radioactive materials (radionuclides) are mixed/distributed from their protective containers within this room. If dose administration and on-site mixing and preparation uses only low-level premixed radioactive materials, then a hot lab is not indicated and these nuclear medicine spaces will follow the general examination room space in Table 8.2 of this standard for ventilation requirements.

Add new Table 8.2 and notes as shown.

Table 8.2 Design Parameters—General Outpatient Spaces (q)

Function of Space (f)	Pressure Relationship to Adjacent Areas (d)	ach Design Option: Min. Outdoor ach (q)	ach Design Option: Min. Total ach (q)	All Room Air Exhausted Directly to Outdoors (j)	Air Recirculated by Means of Room Units (a)	Min. Filter Efficiencies (c)	Design RH % (i)	Design Temperature °F/°C (k)	R_p-R_a Air-Class Design Option: Air Class (q)	R_p cfm/(L·s)/ person and Min. Space Population (q)	R_a cfm/ft/(L·s/m) (q)
GENERAL DIAGNOSTIC AND TREATMENT											
Birthing room *(FGI 2.4-2.2)*	NR	2	3	NR (h)	NR	14	Max 60	70–75/21–24	2	10 (5) / 4	0.18 / (0.9)
Urgent care exam (e) *(FGI 2.5-3.2.1)*	NR	2	3	NR	NR	8	NR	70–75/21–24	2	7.5 (3.8) / 3	0.12 / (0.6)
Urgent care treatment (e) *(FGI 2.5-3.2.2)*	NR	2	3	NR	NR	8	NR	70–75/21–24	2	7.5 (3.8) / 3	0.18 / (0.9)
Urgent care triage *(FGI 2.5-3.2.3)*	Negative	2	3	Yes	NR	8	Max 60	70–75/21–24	3	10 (5) / 3	0.18 / (0.9)
Urgent care observation *(FGI 2.5-3.3)*	NR	2	2	NR	NR	8	NR	70–75/21–24	2	5 (2.5) / 2	0.12 / (0.6)
General examination room *(FGI 2.1-3.2.1)*	NR	2	2	NR	NR	8	NR	70–75/21–24	1	7.5 (3.8) / 3	0.12 / (0.6)
Specialty IC exam room (b) *(FGI 2.5-3.2.3)*	Negative	2	3	Yes	NR	8	Max 60	70–75/21–24	3	10 (5) / 3	0.18 / (0.9)
Laboratory work room (l) *(FGI 2.1-4.1.2.1)*	NR	2	3	NR (h)	NR	8	NR	70–75/21–24	2	7.5 (3.8) / 2	0.12 / (0.6)
Medication room *(FGI 2.1-3.8.8.2)*	NR	2	2	NR	NR	8	Max 60	70–75/21–24	1	5 (2.5) / 2	0.18 / (0.9)
Class 1 Imaging rooms (g) *(FGI 2.1-3.5)*	NR	2	3	NR	NR	8	Max 60	72–78/22–26	1	7.5 (3.8) / 2	0.12 / (0.6)
Psychiatric examination room *(FGI 2.11-3.2.2)*	NR	2	3	NR	NR	8	NR	70–75/21–24	1	5 (2.5) / 2	0.06 / (0.3)
Psychiatric consultation room *(FGI 2.11-3.2.4)*	NR	2	3	NR	NR	8	NR	70–75/21–24	1	5 (2.5) / 2	0.06 / (0.3)
Psychiatric group room *(FGI 2.11-3.2.5)*	NR	2	3	NR	NR	8	NR	70–75/21–24	1	5 (2.5) / 2	0.06 / (0.3)
Psychiatric seclusion room *(FGI 2.11-3.2.7)*	NR	2	2	NR	NR	8	NR	70–75/21–24	2	10 (5) / 3	0.12 / (0.6)
ECT procedure room (FGI 2.11-3.2.9.2)	NR	2	2	NR	NR	8	NR	70–75/21–24	1	7.5 (3.8) / 3	0.12 / (0.6)
Physical therapy individual room *(FGI 2.12-3.2.2.1)*	NR	2	3	NR (h)	NR	8	NR	70–75/21–24	2	10 (5) / 3	0.12 / (0.6)
Physical therapy exercise area *(FGI 2.12-3.2.3)*	NR	2	3	NR (h)	NR	8	NR	70–75/21–24	2	20 (10) / 2	0.18 / (0.9)
Hydrotherapy *(FGI 2.12-3.2.4)*	Negative	2	3	Yes	NR	8	NR	72–80/22–27	3	20 (10) / 2	0.12 / (0.6)
Physical therapeutic pool *(FGI 2.12-3.2.4)*	Negative	2	10	Yes	NR	8	NR	72–80/22–27	3	—	0.48 / (2.4)
Speech therapy room *(FGI 2.12-3.3.2)*	NR	2	2	NR	NR	8	NR	70–75/21–24	1	5 (2.5) / 2	0.06 / (0.3)
Occupational therapy *(FGI 2.12-3.3)*	NR	2	3	NR	NR	8	NR	70–75/21–24	1	5 (2.5) / 2	0.06 / (0.3)
Prosthetics and orthotics room *(FGI 2.12-3.3.1)*	NR	2	3	NR	NR	8	NR	70–75/21–24	2	10 (5) / 3	0.18 / (0.9)
Dental treatment *(FGI 2.14-3.1.1)*	NR	2	3	NR	NR	8	NR	70–75/21–24	1	10 (5) / 3	0.18 / (0.9)
Other dental treatment areas *(FGI 2.14-3.2)*	NR	2	3	NR	NR	8	NR	70–75/21–24	1	5 (2.5) / 2	0.06 / (0.3)
Toilet room *(FGI 2.1-3.10.2)*	Negative	NR	4	Yes	No	8	NR	NR	3	—	—
SERVICE /SUPPORT SPACE											
Environmental services room *(FGI 2.1-5.3.1)*	Negative	NR	6	Yes	No	8	NR	NR	3	—	—
Clean supply (m) (n) *(FGI 2.1-3.8.11)*	NR	2	2	NR	NR	8	NR	NR	1	5 (2.5) / 2	0.12 / (0.6)
Soiled holding (m) (o) (p) *(FGI 2.1-3.8.12)*	Negative	NR	6	Yes	No	8	NR	NR	3	5 (2.5) / 2	0.12 / (0.6)

Informative Note: NR = no requirement

Normative Notes for Table 8.2

a. Except where indicated by a "No" in this column, recirculating room HVAC units (with heating or cooling coils) are acceptable for providing that portion of the minimum total air changes per hour that is permitted by Section 8.1(a)(5). Because of the cleaning difficulty and potential for buildup of contamination, recirculating room units shall not be used in areas marked "No."
b. Examination rooms (identified as specialty infection control-IC exam rooms) programmed for use by patients with undiagnosed gastrointestinal symptoms, undiagnosed respiratory symptoms, or undiagnosed skin symptoms.
c. Table entries are the minimum filter efficiencies required for the space. Refer to Section 6.4 of this document for further clarification of filtration requirements. The minimum efficiency reporting value (MERV) is based on the method of testing described in ANSI/ASHRAE Standard 52.2, *Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size*. (***Informative Note:*** See ASHRAE [2012] in Appendix B.)
d. Pressure monitoring devices are not required for any spaces indicated in Table 8.2. Simple visual methods such as ball-in-tube or flutterstrip are suggested should pressurization verification of airflow direction be desired or required by others.
e. Treatment rooms used for procedures with nitrous oxide shall contain provisions for exhausting anesthetic waste gases, and the minimum total air changes shall be increased to 6. When this condition occurs the R_p-R_a air-class design option cannot be used.
f. Parenthetic notations following a space name are paragraph references to the 2018 Facility Guidelines Institute document *Guidelines for Design and Construction of Hospitals and Outpatient Facilities* (***Informative Note:*** *FGI [2018]*). These FGI paragraph references are provided to the user of the standard to aid in the application of design requirements.
g. Refer to Table 8.1 under the space type "Diagnostic imaging waiting area" for space ventilation requirements in an instance where a facility proposes an imaging waiting area and their ICRA determines that the imaging waiting area requires special consideration to reduce the risk of airborne infection transmission.
h. In some areas with potential contamination and/or odor concerns, exhaust air shall be discharged to the outdoors and not recirculated to other areas. This exhaust may be localized by switch or timer or otherwise under operational control of the facility staff or patient.
i. The relative humidity ranges listed are the minimum and/or maximum allowable at any point within the design temperature range required for that space.
j. Unless otherwise noted via Note (h) above, the exhaust rate shall meet or exceed minimum total air change requirement.
k. Systems shall be capable of maintaining the rooms within the range during normal operation. Lower or higher temperature shall be permitted when patients' comfort and/or medical conditions require those conditions.
l. This room is intended for basic blood and urine specimen testing and short-term storage only. Outpatient facilities that provide the following specialized service spaces/rooms should consult Table 7.1 for ventilation requirements: laboratory work areas, including the specialty lab services such as bacteriology, biochemistry, cytology, glasswashing, histology, media transfer, microbiology, nuclear medicine, pathology, serology, and/or sterilizing.
m. Outpatient facilities that provide the following specialized service spaces/rooms should consult Table 8.1 for ventilation requirements: laundry, general, and soiled linen sorting and storage.
n. Refer to Table 8.1 under the space type "Clean workroom or clean supply" for space ventilation requirements if a clean workroom space is provided.
o. Refer to Table 8.1 under the space type "Soiled workroom or soiled holding" for space ventilation requirements if a soiled workroom space is provided.
p. This space is permitted to include hazardous material storage (general medical waste). If actual regulated waste holding is anticipated, refer to Table 8.1 under the space type "Regulated waste holding" for ventilation requirements.
q. See Section 8.2(a)(6) and 8.2(a)(8).

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 · 180 Technology Parkway NW · Peachtree Corners, GA 30092 · www.ashrae.org

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As an industry leader in research, standards writing, publishing, certification, and continuing education, ASHRAE and its members are dedicated to promoting a healthy and sustainable built environment for all, through strategic partnerships with organizations in the HVAC&R community and across related industries.

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