ADDENDA

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

Ventilation of Health Care Facilities

Approved by ASHRAE Standard Committee and the ASHRAE Board of Directors on February 5, 2020; by the American Society for Healthcare Engineering on December 19, 2019; and by the American National Standards Institute on March 2, 2020.

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c. offering constructive criticism for improving the Standard, or
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FOREWORD

Addendum p incorporates updates to Table 7.1.

a. *A column is created indicating spaces where unoccupied turndown is acceptable.*
b. *Table 6.4 is incorporated into Table 7.1 to remove confusion so that filter requirements will be uniformly applied.*
c. *Space names are aligned with names appearing in FGI 2014 and indicating the appropriate sections in FGI 2014 where that space is referenced. Numerous spaces have been relocated within the table with no changes to their previous requirements, For these spaces previous locations are shown in strikethrough while the new locations are shown in underline.*

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 p to Standard 170-2017

Revise Section 5 as shown.

5. PLANNING

Owners/managers of health care facilities shall prepare a detailed program that shall include the clinical service expected in each space, the specific user equipment expected to be used in each space, and any special clinical needs for temperature, humidity, and pressure control. The program shall include space names and paragraph numbering references from the applicable version of the FGI *Guidelines for Design and Construction of Hospitals and Outpatient Facilities* for each space noted within the program. This program shall be prepared in the planning phase of design.

Revise Section 6.4 as shown. The remainder of Section 6.4 is unchanged.

6.4 Filtration. Filter banks shall be provided in accordance with Table ~~6.4~~7.1. Each filter bank with an efficiency of greater than MERV 12 shall be provided with an installed manometer or differential pressure measuring device that is readily accessible and provides a reading of differential static pressure across the filter to indicate when the filter needs to be changed. All of the air provided to a space shall be filtered in accordance with Table ~~6.4~~7.1, except as otherwise indicated in Sections 7.1, 8.1, and 9.1 for spaces that allow recirculating room HVAC units.

Informative Note: For more information, see CDC (2003) in Informative Appendix B.

~~**Table 6.4 Minimum Filter Efficiencies**~~

~~Space Designation (According to Function)~~	~~Filter Bank No. 1 (MERV)[a]~~	~~Filter Bank No. 2 (MERV)[a]~~
~~Operating rooms (ORs); inpatient and ambulatory diagnostic and therapeutic radiology; inpatient delivery and recovery spaces~~	~~7~~	~~14~~
~~Inpatient care, treatment, and diagnosis, and those spaces providing direct service or clean supplies and clean processing (except as noted below); AII (rooms)~~	~~7~~	~~14~~
~~Protective environment (PE) rooms~~	~~7~~	~~HEPA[c,d]~~
~~Laboratory work areas, procedure rooms, and associated semirestricted spaces~~	~~13[b]~~	~~NR~~

~~NR = not required~~

~~a. *Informative Note:* The minimum efficiency reporting value (MERV) is based on the method of testing described in ANSI/ASHRAE Standard 52.2 (ASHRAE [2017a]).~~

~~b. Additional prefilters may be used to reduce maintenance for filters with efficiencies higher than MERV 7.~~

~~c. As an alternative, MERV-14 rated filters may be used in Filter Bank No. 2 if a tertiary terminal HEPA filter is provided for these spaces.~~

~~d. *Informative Note:* 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-CC001.6 (IEST [2016]).~~

~~**Table 6.4 Minimum Filter Efficiencies**~~

~~Space Designation (According to Function)~~	~~Filter Bank No. 1 (MERV)[a]~~	~~Filter Bank No. 2 (MERV)[a]~~
~~Administrative; bulk storage; soiled holding spaces; food preparation spaces; and laundries~~	~~7~~	~~NR~~
~~All other outpatient spaces~~	~~7~~	~~NR~~
~~Nursing facilities~~	~~13~~	~~NR~~
~~Psychiatric hospitals~~	~~7~~	~~NR~~
~~Resident care, treatment, and support areas in inpatient hospice facilities~~	~~13~~	~~NR~~
~~Resident care, treatment, and support areas in assisted living facilities~~	~~7~~	~~NR~~

~~NR = not required~~

~~a. *Informative Note:* The minimum efficiency reporting value (MERV) is based on the method of testing described in ANSI/ASHRAE Standard 52.2 (ASHRAE [2017a]).~~

~~b. Additional prefilters may be used to reduce maintenance for filters with efficiencies higher than MERV 7.~~

~~c. As an alternative, MERV-14 rated filters may be used in Filter Bank No. 2 if a tertiary terminal HEPA filter is provided for these spaces.~~

~~d. *Informative Note:* 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-CC001.6 (IEST [2016]).~~

Revise Section 7.1(a)(3) and 7.1(b) as shown. The remainder of Section 7.1 is unchanged.

7.1 General Requirements. The following general requirements shall apply for space ventilation:

a. Spaces shall be ventilated according to Table 7.1.

[. . .]

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 7.1 to be at a negative pressure relationship and are not required to be exhausted shall 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~~ Except where indicated by a "No" in the "Unoccupied Turndown" column, the number of air changes ~~can~~ shall be permitted to be reduced and the temperature and design relative humidity altered 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, temperature and design relative humidity indicated ~~is~~ are re-established anytime the space becomes occupied (refer to Informative Appendix A for additional information). 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 upon the space cooling or heating load.

[. . .]

b. Air filtration for spaces shall comply with Table ~~6.4~~7.1.

Revise Table 7.1 and its notes as shown.

Table 7.1 Design Parameters—Inpatient Spaces~~Hospital Spaces~~

Function of Space (ad)	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)	Unoccupied Turndown	Minimum Filter Efficiencies (ab)	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
NURSING UNITS AND OTHER PATIENT CARE AREAS ~~SURGERY AND CRITICAL CARE~~									
Cesarean D~~d~~elivery room ~~Cesarean~~ (2.2–2.11.9) (m), (o)	Positive	4	20	NR	No	Yes	8/14	20–60	68–75/20–24
Critical care patient care station (2.2–2.6.2) ~~Critical and intensive care~~	NR	2	6	NR	No	Yes	8/14	30–60	70–75/21–24
Emergency department exam/treatment room (2.2–3.1.3.6) (p)	NR	2	6	NR	NR	Yes (ae)	8/14	Max 60	70–75/21–24
Emergency department human decontamination [2.2-3.1.3.6 (8)]	Negative	2	12	Yes	No	Yes (ae)	8/14	NR	NR
Emergency department public waiting area (2.2–3.1.3.4)	Negative	2	12	Yes (q)	NR	Yes (ae)	8/14	Max 65	70–75/21–24
Emergency department T~~t~~rauma/resuscitation room ~~(crisis or shock)~~ (2.2–3.1.3.3[6]) (c)	Positive	3	15	NR	No	Yes	8/14	20–60	70–75/21–24
Emergency service T~~t~~riage area (2.2–3.1.3.3)	Negative	2	12	Yes (q)	NR	Yes (ae)	8/14	Max 60	70–75/21–24
Intermediate care patient room (2.2–2.5.2) (s)	NR	2	6	NR	NR	Yes	8/14	Max 60	70–75/21–24
Laser eye room	Positive	3	15	NR	No	Yes	8/14	20–60	70–75/21–24
Medical/anesthesia gas storage (2.2–3.3.6.11 [3]) (r)	Negative	NR	8	Yes	NR	No	8/NR	NR	NR
~~Newborn~~Neonatal intensive care (2.2–2.10.2)	Positive	2	6	NR	No	Yes	8/14	30–60	72–78/22–26
Operating room (2.2–3.3.2) (m), (o)	Positive	4	20	NR	No	Yes	8/14	20–60	68–75/20–24
Operating/surgical cystoscopic rooms (m), (o)	Positive	4	20	NR	No	Yes	8/14	20–60	68–75/20–24
Phase I PACU and Phase II recovery (2.2–3.3.4.3 and 2.2–3.3.4.4) ~~Recovery room~~	NR	2	6	NR	No	Yes	8/14	20–60	70–75/21–24
Procedure room (3.7–3.2) (o), (d)	Positive	3	15	NR	No	Yes	13/NR	20–60	70–75/21–24
Radiology waiting rooms	Negative	2	12	Yes (q), (w)	NR	Yes (ae)	8/14	Max 60	70–75/21–24
Sterile processing room (2.2–3.3.6.13) ~~Substerile service area~~	NR	2	6	NR	No	Yes	8/14	NR	NR
Treatment room (p)	NR	2	6	NR	NR	Yes	8/14	20–60	70–75/21–24

Note: NR = no requirement

Table 7.1 Design Parameters—Inpatient Spaces~~Hospital Spaces~~ *(Continued)*

Function of Space (ad)	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)	Unoccupied Turndown	Minimum Filter Efficiencies (ab)	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
Wound intensive care (burn unit)	NR	2	6	NR	No	Yes	8/14	40–60	70–75/21–24
~~INPATIENT NURSING~~									
AII anteroom (2.1–2.4.2.3) (u)	(e)	NR	10	Yes	No	Yes	8/14	NR	NR
AII room (2.1–2.4.2) (u)	Negative	2	12	Yes	No	Yes	8/14	Max 60	70–75/21–24
Combination AII/PE anteroom (2.2–2.2.4.5)	(e)	NR	10	Yes	No	No	8/14	NR	NR
Combination AII/PE room (2.2–2.2.4.5)	Positive	2	12	Yes	No	No	8/HEPA(ac)	Max 60	70-75/21-24
Continued care nursery (2.2–2.12.3.3)	N/R	2	6	N/R	No	Yes	8/14	30–60	72–78/22–26
Labor/delivery/recovery (LDR) (2.2–2.11.3) (s)	NR	2	6	NR	NR	Yes	8/14	Max 60	70–75/21–24
Labor/delivery/recovery/postpartum (LDRP) (2.2–2.11.3) (s)	NR	2	6	NR	NR	Yes	8/14	Max 60	70–75/21–24
Newborn nursery ~~suite~~ (2.2–2.12.3.1)	NR	2	6	NR	No	Yes	8/14	30–60	72–78/22–26
Nourishment area or room (2.1–2.6.7)	NR	NR	2	NR	NR	Yes	8/14	NR	NR
Nursery workroom (2.2–2.12.6.3)	NR	2	6	NR	No	Yes	8/14	Max 60	72–78/22–26
Patient care area corridor	NR	NR	2	NR	NR	Yes	8/14	NR	NR
Patient room (2.1–2.2)	NR	2	4 (y)	NR	NR	Yes	8/14	Max 60	70–75/21–24
Patient ~~T~~toilet room (2.1–2.2.6)	Negative	NR	10	Yes	No	Yes (ae)	8/NR	NR	NR
PE anteroom (t)	(e)	NR	10	NR	No	No	8/14	NR	NR
Protective environment room (2.2–2.2.4.4) (t)	Positive	2	12	NR	No	No	8/HEPA(ac)	Max 60	70–75/21–24
Seclusion room (2.1–2.4.3)	NR	2	4 (y)	NR	NR	Yes	8/NR	Max 60	70–75/21–24
~~NURSING FACILITY~~									
~~Bathing room~~	~~Negative~~	~~NR~~	~~10~~	~~Yes~~	~~No~~			~~NR~~	~~70–75/21–24~~
~~Occupational therapy~~	~~NR~~	~~2~~	~~6~~	~~NR~~	~~NR~~			~~NR~~	~~70–75/21–24~~
~~Physical therapy~~	~~Negative~~	~~2~~	~~6~~	~~NR~~	~~NR~~			~~NR~~	~~70–75/21–24~~
~~Resident gathering/activity/dining~~	~~NR~~	~~4~~	~~4~~	~~NR~~	~~NR~~			~~NR~~	~~70–75/21–24~~

Note: NR = no requirement

Table 7.1 Design Parameters—Inpatient Spaces~~Hospital Spaces~~ *(Continued)*

Function of Space (ad)	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)	Unoccupied Turndown	Minimum Filter Efficiencies (ab)	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
~~Resident room~~	~~NR~~	~~2~~	~~2~~	~~NR~~	~~NR~~			~~NR~~	~~70–75/21–24~~
~~Resident unit corridor~~	~~NR~~	~~NR~~	~~4~~	~~NR~~	~~NR~~			~~NR~~	~~NR~~
DIAGNOSTIC AND TREATMENT~~RADIOLOGY~~									
Bronchoscopy, sputum collection, and pentamidine administration	Negative	2	12	Yes	No	Yes	8/14	NR	68–73/20–23
Darkroom (2.2–3.6.6) (g)	Negative	2	10	Yes	No	No	8/NR	NR	NR
Dialysis treatment area	NR	2	6	NR	NR	Yes	8/NR	NR	72–78/22–26
Dialyzer reprocessing room	Negative	NR	10	Yes	No	Yes (ae)	8/NR	NR	NR
ECT procedure room (2.5–3.4.2.2)	NR	2	4	NR	NR	Yes	8/14	Max 60	72–78/22–26
Endoscope cleaning	Negative	2	10	Yes	No	No	8/14	NR	NR
Gastrointestinal endoscopy procedure room (x)	NR	2	6	NR	No	Yes	8/14	20–60	68–73/20–23
General examination room	NR	2	4	NR	NR	Yes	8/14	Max 60	70–75/21–24
Hydrotherapy	Negative	2	6	NR	NR	Yes	8/NR	NR	72–80/22–27
Imaging (diagnostic and treatment) ~~X-ray (diagnostic and treatment)~~	NR	2	6	NR	NR	Yes	8/14	Max 60	72–78/22–26
Interventional and intraoperative MRI procedure room (2.2–3.5.2)	Positive	3	15	NR	No	Yes	8/14	Max 60	70–75/21–24
~~Interventional imaging procedure room (2.2–3.5.2)~~ ~~X-ray (surgery/critical care and catheterization)~~	Positive	3	15	NR	No	Yes	8/14	Max 60	70–75/21–24
Medication room	NR	2	4	NR	NR	Yes	8/14	Max 60	70–75/21–24
Nuclear medicine hot lab	Negative	NR	6	Yes	No	Yes (ae)	8/NR	NR	70–75/21–24
Nuclear medicine procedure ~~treatment~~ room (2.2–3.6.1)	Negative	2	6	Yes	NR	Yes	8/14	NR	70–75/21–24
Physical therapy	Negative	2	6	NR	NR	Yes	8/NR	Max 65	72–80/22–27
Special examination room (aa)	NR	2	6	NR	NR	Yes	8/14	Max 60	70–75/21–24

Note: NR = no requirement

Table 7.1 Design Parameters—Inpatient Spaces~~Hospital Spaces~~ *(Continued)*

Function of Space (ad)	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)	Unoccupied Turndown	Minimum Filter Efficiencies (ab)	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
Treatment room	NR	2	6	NR	NR	Yes	8/14	Max 60	70–75/21–24
~~DIAGNOSTIC AND TREATMENT~~									
~~Autopsy room~~	~~Negative~~	~~2~~	~~12~~	~~Yes~~	~~No~~			~~NR~~	~~68–75/20–24~~
~~Laboratory work area, bacteriology (f), (v)~~	~~Negative~~	~~2~~	~~6~~	~~Yes~~	~~NR~~			~~NR~~	~~70–75/21–24~~
~~Laboratory work area, biochemistry (f), (v)~~	~~Negative~~	~~2~~	~~6~~	~~Yes~~	~~NR~~			~~NR~~	~~70–75/21–24~~
~~Laboratory work area, cytology (f), (v)~~	~~Negative~~	~~2~~	~~6~~	~~Yes~~	~~NR~~			~~NR~~	~~70–75/21–24~~
~~Laboratory work area, general (f), (v)~~	~~Negative~~	~~2~~	~~6~~	~~NR~~	~~NR~~			~~NR~~	~~70–75/21–24~~
~~Laboratory work area, glasswashing (f)~~	~~Negative~~	~~2~~	~~10~~	~~Yes~~	~~NR~~			~~NR~~	~~NR~~
~~Laboratory work area, histology (f), (v)~~	~~Negative~~	~~2~~	~~6~~	~~Yes~~	~~NR~~			~~NR~~	~~70–75/21–24~~
~~Laboratory work area, media transfer (f), (v)~~	~~Positive~~	~~2~~	~~4~~	~~NR~~	~~NR~~			~~NR~~	~~70–75/21–24~~
~~Laboratory work area, microbiology (f), (v)~~	~~Negative~~	~~2~~	~~6~~	~~Yes~~	~~NR~~			~~NR~~	~~70–75/21–24~~
~~Laboratory work area, nuclear medicine (f), (v)~~	~~Negative~~	~~2~~	~~6~~	~~Yes~~	~~NR~~			~~NR~~	~~70–75/21–24~~
~~Laboratory work area, pathology (f), (v)~~	~~Negative~~	~~2~~	~~6~~	~~Yes~~	~~NR~~			~~NR~~	~~70–75/21–24~~
~~Laboratory work area, serology (f), (v)~~	~~Negative~~	~~2~~	~~6~~	~~Yes~~	~~NR~~			~~NR~~	~~70–75/21–24~~
~~Laboratory work area, sterilizing (f)~~	~~Negative~~	~~2~~	~~10~~	~~Yes~~	~~NR~~			~~NR~~	~~70–75/21–24~~
~~Nonrefrigerated body-holding room (h)~~	~~Negative~~	~~NR~~	~~10~~	~~Yes~~	~~No~~			~~NR~~	~~70–75/21–24~~
~~Pharmacy (b)~~	~~Positive~~	~~2~~	~~4~~	~~NR~~	~~NR~~			~~NR~~	~~NR~~
~~STERILIZING~~									
~~Sterilizer equipment room~~	~~Negative~~	~~NR~~	~~10~~	~~Yes~~	~~No~~			~~NR~~	~~NR~~
PATIENT SUPPORT FACILITIES									
Bedpan room	Negative	NR	10	Yes	No	No	8/NR	NR	NR
Environmental services room (2.1–4.3.8.12)	Negative	NR	10	Yes	No	No	8/NR	NR	NR
Food and supply storage (2.1–4.3.8.11)	NR	NR	2	NR	No	No	8/NR	NR	72–78/22–26
Food preparation areas (i) (2.1–4.3.2)	NR	2	10	NR	No	Yes	8/NR	NR	72–78/22–26

Note: NR = no requirement

Table 7.1 Design Parameters—Inpatient Spaces~~Hospital Spaces~~ *(Continued)*

Function of Space (ad)	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)	Unoccupied Turndown	Minimum Filter Efficiencies (ab)	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
Laboratory work area, bacteriology (f), (v)	Negative	2	6	Yes	NR	Yes	13/NR	NR	70–75/21–24
Laboratory work area, biochemistry (f), (v)	Negative	2	6	Yes	NR	Yes	13/NR	NR	70–75/21–24
Laboratory work area, cytology (f), (v)	Negative	2	6	Yes	NR	Yes	13/NR	NR	70–75/21–24
Laboratory work area, general (f), (v)	Negative	2	6	NR	NR	Yes	13/NR	NR	70–75/21–24
Laboratory work area, glasswashing (f)	Negative	2	10	Yes	NR	Yes	13/NR	NR	NR
Laboratory work area, histology (f), (v)	Negative	2	6	Yes	NR	Yes	13/NR	NR	70–75/21–24
Laboratory work area, media transfer (f), (v)	Positive	2	4	NR	NR	Yes	13/NR	NR	70–75/21–24
Laboratory work area, microbiology (f), (v)	Negative	2	6	Yes	NR	Yes	13/NR	NR	70–75/21–24
Laboratory work area, nuclear medicine (f), (v)	Negative	2	6	Yes	NR	Yes	13/NR	NR	70–75/21–24
Laboratory work area, pathology (f), (v)	Negative	2	6	Yes	NR	No	13/NR	NR	70–75/21–24
Laboratory work area, serology (f), (v)	Negative	2	6	Yes	NR	Yes	13/NR	NR	70–75/21–24
Laboratory work area, sterilizing (f)	Negative	2	10	Yes	NR	Yes	13/NR	NR	70–75/21–24
Pharmacy Services: Pharmacy Areas (b) (2.1–4.2.2)	Positive	2	4	NR	NR	Yes	8/14	Max 60	70–75/21–24
Toilet room (2.1–4.3.9.1)	Negative	NR	10	Yes	No	Yes	8/NR	NR	72–78/22–26
Warewashing (2.1–4.3.4)	Negative	NR	10	Yes	No	Yes	8/NR	NR	NR
GENERAL SUPPORT FACILITIES: STERILE PROCESSING ~~DEPARTMENT~~ [z]									
Clean assembly/workroom (2.1–5.1.2) (z)	Positive	2	4	NR	No	No	8/14	Max 60	68–73/20–23
Soiled workroom/~~D~~decontamination room (2.1–5.1.3) (z)	Negative	2	6	Yes	No	No	8/NR	NR	60–73/16–23
Sterile storage room (clean/sterile medical/ surgical supplies (2.1–5.1.4.1) (z)	Positive	2	4	NR	NR	No	8/14	Max 60	Max 75/24
OTHER GENERAL SUPPORT FACILITIES									
Autopsy room (2.1–5.7.2.2)	Negative	2	12	Yes	No	No	8/14	NR	68–75/20–24
Clean linen storage room (2.1–5.2.3.2)	Positive	NR	2	NR	NR	Yes	8/14	NR	72–78/22–26

Note: NR = no requirement

Table 7.1 Design Parameters—Inpatient Spaces~~Hospital Spaces~~ *(Continued)*

Function of Space (ad)	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)	Unoccupied Turndown	Minimum Filter Efficiencies (ab)	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
Hazardous material storage	Negative	2	10	Yes	No	No	8/NR	NR	NR
Laundry, processing room (2.1–5.2.2 [2])	Negative	2	10	Yes	No	No	8/NR	NR	NR
Linen and refuse chute room (2.1–5.4.1.4)	Negative	NR	10	Yes	No	No	8/NR	NR	NR
Nonrefrigerated body-holding room (h)	Negative	NR	10	Yes	No	No	13/NR	NR	70–75/21–24
Regulated waste holding spaces (2.1–5.4.1.3)	Negative	NR	10	Yes	No	No	8/NR	NR	NR
Toilet (2.1–5.2.4.1)	Negative	NR	10	Yes	No	Yes	8/NR	NR	NR
SERVICE									
~~Bathroom~~	~~Negative~~	~~NR~~	~~10~~	~~Yes~~	~~No~~			~~NR~~	~~72–78/22–26~~
~~Bedpan room~~	~~Negative~~	~~NR~~	~~10~~	~~Yes~~	~~No~~			~~NR~~	~~NR~~
~~Clean linen storage~~	~~Positive~~	~~NR~~	~~2~~	~~NR~~	~~NR~~			~~NR~~	~~72–78/22–26~~
~~Dietary storage~~	~~NR~~	~~NR~~	~~2~~	~~NR~~	~~No~~			~~NR~~	~~72–78/22–26~~
~~Food preparation center (i)~~	~~NR~~	~~2~~	~~10~~	~~NR~~	~~No~~			~~NR~~	~~72–78/22–26~~
~~Janitor's closet~~	~~Negative~~	~~NR~~	~~10~~	~~Yes~~	~~No~~			~~NR~~	~~NR~~
~~Laundry, general~~	~~Negative~~	~~2~~	~~10~~	~~Yes~~	~~No~~			~~NR~~	~~NR~~
~~Linen and trash chute room~~	~~Negative~~	~~NR~~	~~10~~	~~Yes~~	~~No~~			~~NR~~	~~NR~~
~~Soiled linen sorting and storage~~	~~Negative~~	~~NR~~	~~10~~	~~Yes~~	~~No~~			~~NR~~	~~NR~~
~~Warewashing~~	~~Negative~~	~~NR~~	~~10~~	~~Yes~~	~~No~~			~~NR~~	~~NR~~
SUPPORT AREAS FOR NURSING UNITS AND OTHER PATIENT CARE AREAS ~~SPACE~~									
Clean supply room (2.1–2.6.9.2)	Positive	NR	NR	NR	NR	Yes	8/14	NR	NR
Clean workroom ~~or clean holding~~ (2.1–2.6.9.1)	Positive	2	NR~~4~~	NR	NR	Yes	8/14	NR	NR
~~Hazardous material storage~~	~~Negative~~	~~2~~	~~10~~	~~Yes~~	~~No~~			~~NR~~	~~NR~~
Soiled workroom or soiled holding (2.1–2.6.10)	Negative	2	10	Yes	No	No	8/14	NR	NR

Note: NR = no requirement

Normative Notes for Table 7.1:

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 7.1 (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-797), the associated level of risk of the work, and the equipment used in the spaces. ***Informative Note:*** See USP (2017a) in Appendix B.

c. The term *trauma/resuscitation room* as used herein is a first-aid room and/or emergency department room used for general initial treatment of accident victims. The OR within the trauma center that is routinely used for emergency surgery is considered to be an OR by this standard.

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

e. See Section 7.2 and its subsections for pressure relationship requirements.

f. Higher ventilation rates above the total ach listed shall be used when dictated by the laboratory program requirements and the hazard level of the potential contaminants in each laboratory work area. Lower total ach ventilation rates shall be permitted when a Hazard Assessment performed as part of an effective Laboratory Ventilation Management Plan per ANSI/AIHA/ASSE Z9.5, *American National Standard for Laboratory Ventilation*[13] determines that either (a) acceptable exposure concentrations in the laboratory work area can be achieved with a lower minimum total ach ventilation rate than is listed in Table 7.1 or (b) a demand control approach with active sensing of contaminants or appropriate surrogates is used as described in *ASHRAE Handbook—HVAC Applications*, Chapter 16, "Laboratories" (***Informative Note:*** See ASHRAE [2015] in Informative Appendix B).

g. All air need not be exhausted if darkroom equipment has a scavenging exhaust duct attached and meets ventilation standards regarding NIOSH [5], OSHA, and local employee exposure limits.

h. 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.

i. Minimum total air changes per hour (ach) shall be that required to provide proper makeup air to kitchen exhaust systems as specified in ANSI/ASHRAE Standard 154 [6]. In some cases, excess exfiltration or infiltration to or from exit corridors compromises the exit corridor restrictions of NFPA 90A [7], the pressure requirements of NFPA 96 [8], or the maximum defined in the table. During operation, a reduction to the number of air changes to any extent required for odor control shall be permitted when the space is not in use.

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 [9] 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 [10] 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.

p. Treatment rooms used for bronchoscopy shall be treated as bronchoscopy rooms. Treatment 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. See NFPA 99 [10] for further requirements.

s. For intermediate care, labor/delivery/recovery rooms, and labor/delivery/recovery/postpartum rooms, four total ach shall be permitted when supplemental heating and/or cooling systems (radiant heating and cooling, baseboard heating, etc.) are used.

t. The protective environment airflow design specifications protect the patient from common environmental airborne infectious microbes (i.e., *Aspergillus* spores). Recirculation HEPA filters shall be permitted to increase the equivalent room air exchanges; however, the outdoor air changes are still required. Constant-volume airflow is required for consistent ventilation for the protected environment. The pressure relationship to adjacent areas shall remain unchanged if the protective environment (PE) room is used as a normal patient room.

Normative Notes for Table 7.1 (continued):

u. 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 7.1 are still required. AII rooms that are retrofitted from standard patient rooms from which it is impractical to exhaust directly outdoors may be recirculated with air from the AII room, provided that air first passes through a HEPA filter. 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 ~~4~~6 ach. Turndown of minimum air changes for the AII anteroom shall be based around the use of the associated AII room(s).

v. Room temperature ranges that exceed the minimum indicated range shall be permitted if required by the laboratory program or laboratory equipment.

w. The requirement that all room air is 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.

x. 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.

y. For single-bed patient rooms using Group D diffusers, a minimum of six total ach shall be provided and calculated based on the volume from finished floor to 6 ft (1.83 m) above the floor.

z. See AAMI Standard ST79 [11] for additional information for these spaces.

aa. Examination rooms programmed for use by patients with undiagnosed gastrointestinal symptoms, undiagnosed respiratory symptoms, or undiagnosed skin symptoms.

ab. 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, *Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size* ([ASHRAE 2012] in Informative Appendix B).

ac. 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. 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 (IEST [2005] in Informative Appendix B).

ad. Parenthetic notations following a space name are paragraph references to the 2014 FGI *Guidelines for Design and Construction of Hospitals and Outpatient Facilities*. These paragraph references are provided to the user to aid in the application of design requirements.

ae. If this space uses unoccupied turndown it shall include time-delay controls such that turndown does not occur for the first 20 minutes after the space becomes unoccupied. (***Informative Note:*** The 20 minute delay approximates the time required for 90% reduction in airborne contamination at 6 ach, assuming perfect mixing.)

Revise Informative Appendix A as shown. The remainder of the appendix is unchanged.

INFORMATIVE APPENDIX A
OPERATIONS AND MAINTENANCE (O&M) PROCEDURES

[. . .]

A1.4 Filters. Final filters and filter frames should be visually inspected for pressure drop and for bypass monthly. Filters should be replaced based on pressure drop with filters that provide the efficiencies specified in Table ~~6.4~~7.1.

A1.5 Unoccupied Turndown. When unoccupied turndown is implemented for a space, control and operate the turndown mode such that a relative humidity of 60% is not exceeded in the space.

[. . .]

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.

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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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