

ADDENDA

**ANSI/ASHRAE/ASHE Addendum h to
ANSI/ASHRAE/ASHE Standard 170-2021**

Ventilation of Health Care Facilities

Approved by ASHRAE and the American National Standards Institute on September 30, 2022, and by the American Society for Health Care Engineering on September 28, 2022.

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FOREWORD

Addendum h revises Tables 8-1 and 8-2 to incorporate the unoccupied turndown column in each. This will provide clarity and consistency within this standard. Addendum h also modifies text within Sections 8.1 and 8.2 that is associated with unoccupied turndowns.

This addendum comprises the following general edits:

- Revisions to Tables 8-1 and 8-2 incorporating an unoccupied turndown column in each.
- Revisions to Sections 8.1 and 8.2 which are associated with unoccupied turndowns. Specifically, Sections 8.1(a)(3) and 8.2(a)(3) are modified.
- Text from existing Section 8.1(a)(3) is relocated (without text modification) as 8.1(a)(8).
- Minor edit to Table 8-1 correcting an error (omission) from Minimum Filter Efficiencies column for All room.

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 h to Standard 170-2021

Revise Section 8.1(a)(3) as shown.

8.1 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.

[. . .]

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 utilize the supply airflow rate to compute the minimum total air changes per hour required. Except where indicated by a "No" in the "Unoccupied Turndown" column, the number of air changes 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 are reestablished anytime the space becomes occupied (Informative Note: see Informative Appendix A for additional information). ~~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.~~

Revise Section 8.1(a) as shown.

8. A night setback or unoccupied mode (to maintain a temperature range of 55°F to 85°F [13°C to 29°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.

Revise Section 8.2(a)(3) in its entirety as shown (Note: The revised text in this section is the same as in Sections 7.1(a)(3) and 8.1(a)(3).

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.~~
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 8-2 to be at a negative pressure relationship, and that are not required to be exhausted, shall utilize the supply airflow rate to compute the minimum total air changes per hour required. Except where indicated by a "No" in the "Unoccupied Turndown" column, the number of air changes 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 are reestablished anytime the space becomes occupied (*Informative Note:* see 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 on the space cooling or heating load.

Revise Tables 8-1 and 8-2 and notes as shown. The remainder of Table 8-1 is unchanged.

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)	Unoccupied Turndown	Minimum Filter Efficiencies (c)	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
SURGERY AND EMERGENCY DEPARTMENT (ED)									
Delivery (Caesarean) (FGI 2.1–3.2.3) (m), (o), (v), (gg)	Positive	4	20	NR	No	<u>Yes</u>	MERV-16 (dd)	20–60	68–75/20–24
ED human decontamination (FGI 2.8–3.4.8)	Negative	2	12	Yes	No	<u>Yes (ii)</u>	MERV-14 (cc)	NR	NR
ED exam/treatment room (FGI 2.8–3.4.2) (p)	NR	2	6	NR	NR	<u>Yes (ii)</u>	MERV-14 (cc)	Max 60	70–75/21–24
ED public waiting area (FGI 2.8–6.2.3)	Negative	2	12	Yes (q)	NR	<u>Yes (ii)</u>	MERV-8	Max 65	70–75/21–24
Operating room (FGI 2.1–3.2.3) (m), (o), (v), (gg)	Positive	4	20	NR	No	<u>Yes</u>	MERV-16 (dd)	20–60	68–75/20–24
Procedure room (FGI 2.1–3.2.2) (d), (o), (p)	Positive	3	15	NR	No	<u>Yes</u>	MERV-14	20–60	70–75/21–24
Phase I recovery (PACU) (FGI 2.1–3.7.4)	NR	2	6	NR	No	<u>Yes</u>	MERV-8	Max 60	70–75/21–24
Phase II recovery (FGI 2.1–3.7.5) (u)	NR	2	2	NR	NR	<u>Yes</u>	MERV-8	Max 60	70–75/21–24
Preprocedure patient care (FGI 2.1–3.7.3) (t)	NR	2	2	NR	NR	<u>Yes</u>	MERV-8	Max 60	70–75/21–24
Trauma room (crisis or shock) (FGI 2.8–3.4.4) (bb)	Positive	3	15	NR	No	<u>Yes</u>	MERV-14	20–60	70–75/21–24
Triage (FGI 2.8–6.2.2.2 & 6.2.2.3)	Negative	2	12	Yes (q)	NR	<u>Yes (ii)</u>	MERV-8	Max 60	70–75/21–24
DIAGNOSTIC AND TREATMENT									
Class 1 imaging room (FGI 2.1–3.5.2.4[1][b][i]) (ff)	NR (hh)	2	6	NR (hh)	NR	<u>Yes</u>	MERV-8	Max 60	72–78/22–26
Class 2 imaging room (FGI 2.1–3.5.2.4[1][b][ii]) (d), (p), (ff)	Positive	3	15	NR	No	<u>Yes</u>	MERV-14	20–60	70–75/21–24
Class 3 imaging room (FGI 2.1–3.5.2.4[1][b][ii]) (m), (o), (ff)	Positive	4	20	NR	No	<u>Yes</u>	MERV-16 (dd)	20–60	68–75/20–24
Diagnostic imaging waiting (FGI 2.1–3.5.10.4) (g)	Negative	2	12	Yes (q), (r)	NR	<u>Yes (ii)</u>	MERV-8	Max 60	70–75/21–24
All anteroom (FGI 2.1–3.3.2.3) (i)	(e)	NR	10	Yes	No	<u>Yes</u>	MERV-8	NR	NR
All room (FGI 2.1–3.3.2) (i)	Negative	2	12	Yes	No	<u>Yes</u>	MERV-8/14	Max 60	70–75/21–24
PE anteroom (FGI 1.2–4.2.2.1[1]) (n) (w)	(e)	NR	10	NR	No	<u>No</u>	HEPA	NR	NR
Protective environment room (FGI 1.2–4.2.2.1[1]) (n) (w)	Positive	2	12	NR	No	<u>No</u>	HEPA	Max 60	70–75/21–24
Cancer treatment area (FGI 2.6–3.1)	NR	2	6	NR	NR	<u>Yes</u>	MERV-8	Max 60	70–75/21–24
Dialysis treatment area (FGI 2.10–3.2)	NR	2	6	NR	NR	<u>Yes</u>	MERV-8	NR	72–78/22–26
Dialyzer reprocessing room (FGI 2.10–3.8.12)	Negative	NR	10 (ii)	Yes	No	<u>Yes (ii)</u>	MERV-8	NR	NR
Bronchoscopy (FGI 2.1–3.2.2.1) (n) (x)	Negative	2	12	Yes	No	<u>Yes</u>	MERV-14	NR	68–73/20–23
Instrument processing room (FGI 2.1–4.3.2.3)	Negative	2	10	Yes	No	<u>No</u>	MERV-8 (s)	NR	NR
Endoscopy procedure room (FGI 2.9–3.2) (h)	NR	2	6	NR	No	<u>Yes</u>	MERV-8	Max 60	68–73/20–23

Informative Note: NR = no requirement.

4 **Table 8-1 Design Parameters—Specialized Outpatient Spaces (Continued)**

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)	Unoccupied Turndown	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	<u>Yes</u>	MERV-8	Max 60	70–75/21–24
Specialty IC exam room (FGI 2.1–3.2.1.3) (y)	Negative	2	6	Yes	NR	<u>Yes (ii)</u>	MERV-8	Max 60	70–75/21–24
Laboratory work room (FGI 2.1–4.1.2.1) (z)	Negative	2	6	Yes	NR	<u>Yes</u>	MERV-8	NR	70–75/21–24
Pharmacy/med prep (FGI 2.1–3.8.8.2 & 2.1–4.2.2) (b)	Positive	2	4	NR	NR	<u>Yes</u>	MERV-8	NR	NR
Laser eye room (FGI 2.1–3.2.2)	NR	2	6	NR	No	<u>Yes</u>	MERV-8	Max 60	68–73/20–23
Nuclear medicine (see Section 8.7) (FGI 2.1–3.5.7)	Negative	2	6	Yes	No	<u>Yes (ii)</u>	MERV-8	NR	70–75/21–24
Toilet or toilet/shower room (FGI 2.1–3.10.2)	Negative	NR	10	Yes	No	<u>Yes</u>	MERV-8	NR	NR
STERILE PROCESSING (aa)									
One-room sterile processing (FGI 2.1–4.3.2.3)	NR	2	6	NR	No	<u>No</u>	MERV-14 (ee)	NR	NR
Sterilizer equipment room (FGI 2.1–4.3.2.2)	Negative	NR	10	Yes	No	<u>No</u>	MERV-8	NR	NR
Clean workroom (FGI 2.1–4.3.2.2.3)	Positive	2	4	NR	No	<u>No</u>	MERV-14 (ee)	Max 60	60–73/16–23
Clean supply storage (FGI 2.1–4.3.2.2.4)	Positive	2	4	NR	NR	<u>No</u>	MERV-14 (ee)	Max 60	72–78/22–26
Supply receiving (FGI 2.1–4.3.2.4)	Negative	NR	10	Yes	No	<u>No</u>	MERV-8	NR	NR
Decontamination room (FGI 2.1–4.3.2.2)	Negative	2	6	Yes	No	<u>No</u>	MERV-8	NR	60–73/16–23
SERVICE/SUPPORT SPACE									
Environmental services room (FGI 2.1–5.3.1)	Negative	NR	10	Yes	No	<u>No</u>	MERV-8	NR	NR
Laundry/linen processing (FGI 2.1–4.4.2.1)	Negative	2	10	Yes	No	<u>No</u>	MERV-8	NR	NR
Clean workroom or clean supply (FGI 2.1–3.8.11)	Positive	2	4	NR	NR	<u>Yes</u>	MERV-8	NR	NR
Regulated waste holding (FGI 2.1–5.2.1.3)	Negative	2	10	Yes	No	<u>No</u>	MERV-8	NR	NR
Soiled workroom or soiled holding (FGI 2.1–3.8.12)	Negative	2	6	Yes	No	<u>No</u>	MERV-8	NR	72–78/22–26

Informative Note: NR = no requirement.

Normative Notes for Table 8-1:

- [. . .]
- ii. 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.)
- jj. Lower total ach ventilation rates shall be permitted when use of the ASHRAE Standard 62.1¹, Section 6.5, “Exhaust Ventilation,” Performance Compliance Path determines that concentration of the contaminants of concern is lower than the corresponding concentration of interest. In addition to other contaminants of concern required by Standard 62.1 Section 6.5.2, the following contaminants of concern shall be considered for the space and maintained not greater than the concentration level indicated: hydrogen peroxide 1 ppm; glutaraldehyde 0.05 ppm; ethyl alcohol 1000 ppm; isopropyl alcohol 400 ppm. (**Informative Note:** Listed concentrations of interest were determined by ACGIH [2001]; see Informative Appendix E.)

Table 8-2 Design Parameters—General Outpatient Spaces (q)

Function of Space (f)	Pressure Relationship to Adjacent Areas (d)	ach Design Option		All Room Air Exhausted Directly to Outdoors (j)	Air Recirculated by Means of Room Units (a)	Unoccupied Turndown	Min. Filter Efficiencies (c)	Design RH% (i)	Design Temperature °F/°C (k)	R _p -R _a Air-Class Design Option		
		Min. Outdoor ach (q)	Min. Total ach (q)							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	Yes	MERV-14	Max 60	70–75/21–24	2	10 (5) / 4	0.18 / (0.9)
Urgent care exam (FGI 2.5-3.2.1) (e)	NR	2	3	NR	NR	Yes	MERV-8	NR	70–75/21–24	2	7.5 (3.8) / 3	0.12 / (0.6)
Urgent care treatment (FGI 2.5-3.2.2) (e)	NR	2	3	NR	NR	Yes	MERV-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	Yes (r)	MERV-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	Yes	MERV-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	Yes	MERV-8	NR	70–75/21–24	1	7.5 (3.8) / 3	0.12 / (0.6)
Specialty IC exam room (FGI 2.5-3.2.3) (b)	Negative	2	3	Yes	NR	Yes (r)	MERV-8	Max 60	70–75/21–24	3	10 (5) / 3	0.18 / (0.9)
Laboratory work room (FGI 2.1-4.1.2.1) (l)	NR	2	3	NR (h)	NR	Yes	MERV-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	Yes	MERV-8	Max 60	70–75/21–24	1	5 (2.5) / 2	0.18 / (0.9)
Class 1 Imaging rooms (FGI 2.1-3.5) (g)	NR	2	3	NR	NR	Yes	MERV-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	Yes	MERV-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	Yes	MERV-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	Yes	MERV-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	Yes	MERV-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	Yes	MERV-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	Yes	MERV-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	Yes	MERV-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	Yes	MERV-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	Yes	MERV-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	Yes	MERV-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	Yes	MERV-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	Yes	MERV-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	Yes	MERV-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	Yes	MERV-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	Yes	MERV-8	NR	NR	3	—	—
SERVICE /SUPPORT SPACE												
Environmental services room (FGI 2.1-5.3.1)	Negative	NR	6	Yes	No	No	MERV-8	NR	NR	3	—	—
Clean supply (FGI 2.1-3.8.11) (m) (n)	NR	2	2	NR	NR	Yes	MERV-8	NR	NR	1	5 (2.5) / 2	0.12 / (0.6)
Soiled holding (FGI 2.1-3.8.12) (m) (o) (p)	Negative	NR	6	Yes	No	No	MERV- 8	NR	NR	3	5 (2.5) / 2	0.12 / (0.6)

Informative Note: NR = no requirement

Normative Notes for Table 8-1:

[. . .]

- r. 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.)

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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About ASHRAE

Founded in 1894, ASHRAE is a global professional society committed to serve humanity by advancing the arts and sciences of heating, ventilation, air conditioning, refrigeration, and their allied fields.

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.

To stay current with this and other ASHRAE Standards and Guidelines, visit www.ashrae.org/standards, and connect on LinkedIn, Facebook, Twitter, and YouTube.

About ASHE

The American Society for Health Care Engineering (ASHE) of the American Hospital Association is a trusted professional resource that provides education, regulatory guidance, networking, advocacy representation, and professional development for our members. ASHE is committed to our members, the facilities they build and maintain, and the patients they serve.

For more information, visit ashe.org.

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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.

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