

**ANSI/ASHRAE/ASHE Addendum b to
ANSI/ASHRAE/ASHE Standard 170-2008**

ASHRAE/ASHE STANDARD

Ventilation of Health Care Facilities

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American Society of Heating, Refrigerating
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1791 Tullie Circle NE, Atlanta, GA 30329
www.ashrae.org



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FOREWORD

This addendum adds additional requirements to Standard 170 and clarifies some of its previous requirements. Coordination with both ANSI/ASHRAE Standard 62.1, Ventilation for Acceptable Indoor Air Quality and Guidelines for Design and Construction of Hospital and Health Care Facilities are reflected within this addendum. Specifically, it implements the following changes:

1. **Modifications to Table 6-1 and footnotes c and d:** The HEPA filter utilized by the table is more accurately defined. The MERV 17 equivalent rating of ANSI/ASHRAE Standard 52.2, Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size, referenced in the current edition of ANSI/ASHRAE/ASHE Standard 170, Ventilation of Health Care Facilities, is removed.
2. **Modifications to Section 6.3.1 Outdoor Air Intakes:** Relief air discharges are exempted from the requirements for outdoor intakes.
3. **Modifications to Section 6.4 Filtration:** Requirements to improve the performance of filter banks are added to address the problem of air bypassing the filter media.
4. **Modifications to Section 7.4 Surgery Rooms:** Specific requirements for temperature control to operating rooms are added.

5. **Modifications to Section 7.5.1 Morgue and Autopsy Rooms:** Requirements are added for a minimum differential pressure from these spaces that may contain potentially infectious remains.
6. **Modifications to Table 7-1:** The following parts of the table are revised as follows:
 - A new entry for “Intermediate care” is added, and the entries for “Triage” and “Radiology waiting rooms” are revised.
 - The “RH” column header for all entries is revised to emphasize the standard’s intent that it defines design requirements (as noted in its purpose).
 - Twelve different laboratory entries in the “Air Recirculated by means of Room Units” column are revised to permit recirculating room units to be used within these spaces.
 - The pressure requirements of two entries—“Critical and intensive care” and “Wound intensive care (burn unit)” —are revised to allow the user’s program to determine whether positive space pressurization is required.
 - The “Endoscopy” entry is renamed, and its “Minimum Total ach” column entry is revised accordingly.

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~striking through~~ (for deletions), except where some other means of showing changes is specifically described.

Addendum b to Standard 170-2008

[In Table 6-1, revise one entry and note “c,” and add a new note “d” as shown below.]

TABLE 6-1 Minimum Filter Efficiencies

Space Designation (According to Function)	Filter Bank Number 1 (MERV) ^a	Filter Bank Number 2 (MERV) ^a
Protective environment (<u>PE</u>) rooms (PE)	7	17(HEPA) ^{c,d}

Note c: Filter Bank No. 2 may be a MERV 14 if a tertiary terminal filter is provided for these spaces. 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.

Note d: 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 (see Informative Annex B, Bibliography).

[In Section 6.3.1, add the following exception.]

6.3.1 Outdoor Air Intakes. Outdoor air intakes for air-handling units shall be located a minimum of 25 ft (8 m) from cooling towers and all exhaust and vent discharges. Outdoor air intakes shall be located such that the bottom of the air intake is at least six ft (2 m) above grade. Intakes on top of buildings shall be located a minimum of three ft (1 m) above roof level. New facilities with moderate-to-high risk of natural or man-made extraordinary incidents shall locate air intakes away from public access. All intakes shall be designed to prevent the entrainment of wind-driven rain, shall contain features for draining away precipitation, and shall be equipped with a birdscreen of mesh no smaller than 0.5 in. (13 mm).

Exception: Relief air is exempt from the 25-foot (8-meter) separation requirement. Relief air is defined as the Class 1 air (for further information see ASHRAE 62.1) that could be returned to the air-handling unit from the occupied spaces but is being discharged to the outdoors to maintain building pressurization (such as during air-side economizer operation).

[In Section 6.4, add a new Subsection 6.4.3 as shown below.]

6.4.3 Filter Bank Blank-Off Panels. Filter bank blank-off panels shall be permanently attached to the filter bank frame, constructed of rigid materials, and have sealing surfaces equal to or greater than the filter media installed within the filter bank frame.

[In Section 7.4.1, add a new sentence as shown below.]

7.4.1 Class B & C Operating Rooms. Operating 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 operating room shall have individual temperature control. Operating rooms shall be provided with primary supply diffusers that are 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 L/s/m² to 178 L/s/m²). The diffusers shall be concentrated to provide an airflow pattern over the patient and surgical team. (For further information, see Memarzadeh [2002] and Memarzadeh [2004] in Informative Annex B: Bibliography.)
- b. The 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. No more than 30% of the primary supply diffuser array area shall be used for non-diffuser uses such as lights, gas columns, etc. Additional supply diffusers may be required to provide additional ventilation to the operating room to achieve the environmental requirements of Table 7-1 relating to temperature, humidity, etc.

The room shall be provided with at least two low sidewall 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.

[Reformat Section 7.5.1 to match similar subsections as shown below, and add new minimum requirements for differential pressure in Section 7.5.1c.]

~~**7.5.1 Morgue and Autopsy Rooms.** Low sidewall exhaust grilles shall be provided unless exhaust air is removed through an autopsy table designed for this purpose. All exhaust air from autopsy, non-refrigerated body holding and morgue rooms shall be discharged directly to the outdoors without mixing with air from any other room or exhaust system.~~

7.5.1 Morgue and Autopsy Rooms. Ventilation for morgue and autopsy rooms shall meet the following requirements:

- a. Low sidewall exhaust grilles shall be provided, unless exhaust air is removed through an autopsy table designed for this purpose.
- b. All exhaust air from autopsy, nonrefrigerated body-holding, and morgue rooms shall be discharged directly to the outdoors without mixing with air from any other room or exhaust system.
- c. Differential pressure between morgue and autopsy rooms and any adjacent spaces that have other functions shall be a minimum of -0.01 in. wc (-2.5 Pa).

[Revise Table 7-1 entries and footnotes as noted below:]

- Insert a new "Intermediate care" entry between the current "Critical and intensive care" and "Wound intensive care (burn unit)" entries.
- Expand the application of footnote "s" to include the new "Intermediate care" entry.
- Revise the "RH" column header for every entry within the entire table as shown (including all of the entries not listed in this addendum).
- Add footnote "w." Part of the footnote "q" text has been broken out into the new footnote "w" because the removed sentence was not applicable to the ER waiting rooms entry, which also utilizes footnote "q" in the current standard. Footnote "q" is also added to the "Triage" entry.
- Revise the entries under the column header "Air Recirculated by Means of Room Units" as shown for twelve laboratory spaces.
- Revise the "Critical and intensive care" and "Wound intensive care (burn unit)" entries in the "Pressure Relationship to Adjacent Areas" column as shown.
- Rename the "Endoscopy" entry, and revise the minimum total ach as shown.

[Add the following entry to Informative Annex B, Bibliography.]

IEST PR-CC001.3, *HEPA and ULPA Filters (2005)*, Institute of Environmental Sciences and Technology, 2340 South Arlington Heights Road, Suite 100, Arlington Heights, IL 60005-4516.

TABLE 7-1 Design Parameters

Function of Space	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)	RH-Design Relative Humidity (k), %	Design Temperature (l), °F/°C
SURGERY AND CRITICAL CARE							
Critical and intensive care	Positive N/R	2	6	N/R	No	30–60	70–75/21–24
<u>Intermediate care (s)</u>	N/R	<u>2</u>	<u>6</u>	<u>N/R</u>	<u>N/R</u>	<u>max 60</u>	<u>70–75/21–24</u>
Wound intensive care (burn unit)	Positive N/R	2	6	N/R	No	40–60	70–75/21–24
Triage (<u>q</u>)	Negative	2	12	Yes	N/R	max 60	70–75/21–24
Radiology waiting rooms (<u>q</u>), (<u>w</u>)	Negative	2	12	Yes	N/R	max 60	70–75/21–24
DIAGNOSTIC AND TREATMENT							
Laboratory, general (v)	Negative	2	6	N/R	No N/R	N/R	70–75/21–24
Laboratory, bacteriology (v)	Negative	2	6	Yes	No N/R	N/R	70–75/21–24
Laboratory, biochemistry (v)	Negative	2	6	Yes	No N/R	N/R	70–75/21–24
Laboratory, cytology (v)	Negative	2	6	Yes	No N/R	N/R	70–75/21–24
Laboratory, glasswashing	Negative	2	10	Yes	No N/R	N/R	N/R
Laboratory, histology (v)	Negative	2	6	Yes	No N/R	N/R	70–75/21–24
Laboratory, microbiology (v)	Negative	2	6	Yes	No N/R	N/R	70–75/21–24
Laboratory, nuclear medicine (v)	Negative	2	6	Yes	No N/R	N/R	70–75/21–24
Laboratory, pathology (v)	Negative	2	6	Yes	No N/R	N/R	70–75/21–24
Laboratory, serology (v)	Negative	2	6	Yes	No N/R	N/R	70–75/21–24
Laboratory, sterilizing	Negative	2	10	Yes	No N/R	N/R	70–75/21–24
Laboratory, media transfer (v)	Positive	2	4	N/R	No N/R	N/R	70–75/21–24
<u>Gastrointestinal endoscopy procedure room</u>	Positive	2	<u>4–6</u>	N/R	No	30–60	68–73/20–23

Table 7-1 Notes:

- q. In a recirculating ventilation system, HEPA filters shall be permitted instead of exhausting the air from these spaces to the outdoors provided the return air passes through the HEPA filters before it is introduced into any other spaces. ~~This requirement applies only to waiting rooms programmed to hold patients awaiting chest x-rays for diagnosis of respiratory disease.~~
- s. For patient rooms, 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.
- w. This requirement applies only to radiology waiting rooms programmed to hold patients who are waiting for chest x-rays for diagnosis of respiratory disease.

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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.