



# ADDENDA

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

# Ventilation of Health Care Facilities

Approved by the ASHRAE Standards Committee on June 25, 2025; by the American Society for Health Care Engineering on July 18, 2025; and by the American National Standards Institute on July 18, 2025

This addendum was approved by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. Instructions for how to submit a change can be found on the ASHRAE® website ([www.ashrae.org/continuous-maintenance](http://www.ashrae.org/continuous-maintenance)).

The latest edition of an ASHRAE Standard may be purchased on the ASHRAE website ([www.ashrae.org](http://www.ashrae.org)) or from ASHRAE Customer Service, 180 Technology Parkway, Peachtree Corners, GA 30092. E-mail: [orders@ashrae.org](mailto:orders@ashrae.org). Fax: 678-539-2129. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in US and Canada). For reprint permission, go to [www.ashrae.org/permissions](http://www.ashrae.org/permissions).

© 2025 ASHRAE

ISSN 1041-2336



**ASHRAE Standing Standard Project Committee 170**

**Cognizant TC: 9.6, Healthcare Facilities**

**SPLS Liaison: Abdel K. Darwich**

|                                     |                         |                         |                     |
|-------------------------------------|-------------------------|-------------------------|---------------------|
| Jeremy P. Fauber,* <i>Chair</i>     | Mark Davidson           | Paul R. Kondrat*        | Jonathan Rajala     |
| Aaron L. Johnson,* <i>Secretary</i> | John M. Dombrowski*     | Roger W. Lautz*         | Michael Reilly, Jr. |
| Brian Abel                          | James M. Dunn, Jr.      | Jennifer E. Leach       | Edward Renshaw*     |
| George A. Augustini                 | Travis R. English       | Linda D. Lee            | Adel Rizkalla       |
| Sean D. Beilman                     | Lawrence Enright        | Pavel V. Likhonin       | Maya Salabasheva    |
| Jenny M. Berens                     | Karen Estela            | John M. Martin          | Shannon Schmidt     |
| Amit Bhansali*                      | Jack R. Evans           | David M. Mason          | Carl C. Schultz     |
| Robert Booth*                       | Jonathan J. Flannery*   | Ryan F. McCulloch       | Kevin A. Scarlett*  |
| Randy Brannen                       | Glenn Saint Aubin Gall* | Matthew McLaurin        | Gina M. Semerad     |
| Brendon J. Burley                   | Frederick E. Granzow*   | Kenneth R. Mead*        | Charles J. Seyffer  |
| Philip T. Cantin                    | Yanzheng Guan           | Kenneth A. Monroe       | Michael P. Sheerin  |
| Frankie Catalfumo                   | Danette J. Hauck*       | Steven Mumm             | Premkumar Siddharth |
| Sarah Clock*                        | Caleb Haynes            | Dylan Neu               | Steven C. Sill      |
| Dana F. Coliano                     | Robert N. Heinlein, Jr. | Russell N. Olmsted      | Dianthe Van Weerden |
| Gregory Corso                       | Peter J. Hoch           | Justin M. Opperman*     | Michael Witt*       |
| Amy Courtney                        | Louis Iglhaut           | Erick A. Phelps         | Junjing Yang        |
| Abdel K. Darwich                    | Michael R. Keen         | Heather Platt Gullledge |                     |

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

**ASHRAE STANDARDS COMMITTEE 2025–2026**

|   |                    |                       |                                  |
|---|--------------------|-----------------------|----------------------------------|
| Adrienne G. Thomle, <i>Chair</i>              | Susanne Dormann    | Paul A. Lindahl, Jr.  | Paolo M. Tronville               |
| Jennifer A. Isenbeck-Pille, <i>Vice Chair</i> | Drake H. Erbe      | Kenneth A. Monroe     | Douglas K. Tucker                |
| Anthony M. Abate                              | Marcus Hassen      | Philip J. Naughton    | Thomas E. Watson                 |
| Omar A. Abdelaziz                             | William M. Healy   | Kathleen Owen         | David P. Yuill                   |
| Charles S. Barnaby                            | Jaap Hogeling      | Michael P. Patton     | Patrick C. Marks, <i>BOD ExO</i> |
| Hoy R. Bohanon                                | Satish N. Iyengar  | Karl L. Peterman      | Devin A. Abellon, <i>CO</i>      |
| Kelley P. Cramm                               | Phillip A. Johnson | Christopher J. Seeton |                                  |
| Abdel K. Darwich                              | Tatsuro Kobayashi  | Russell C. Tharp      |                                  |

Ryan Shanley, *Senior Manager of Standards*

**SPECIAL NOTE**

This American National Standard (ANS) is a national voluntary consensus Standard developed under the auspices of ASHRAE. *Consensus* is defined by the American National Standards Institute (ANSI), of which ASHRAE is a member and which has approved this Standard as an ANS, as “substantial agreement reached by directly and materially affected interest categories. This signifies the concurrence of more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that an effort be made toward their resolution.” Compliance with this Standard is voluntary until and unless a legal jurisdiction makes compliance mandatory through legislation.

ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

ASHRAE Standards are prepared by a Project Committee appointed specifically for the purpose of writing the Standard. The Project Committee Chair and Vice-Chair must be members of ASHRAE; while other committee members may or may not be ASHRAE members, all must be technically qualified in the subject area of the Standard. Every effort is made to balance the concerned interests on all Project Committees.

The Senior Manager of Standards of ASHRAE should be contacted for

- interpretation of the contents of this Standard,
- participation in the next review of the Standard,
- offering constructive criticism for improving the Standard, or
- permission to reprint portions of the Standard.

**DISCLAIMER**

ASHRAE uses its best efforts to promulgate Standards and Guidelines for the benefit of the public in light of available information and accepted industry practices. However, ASHRAE does not guarantee, certify, or assure the safety or performance of any products, components, or systems tested, installed, or operated in accordance with ASHRAE's Standards or Guidelines or that any tests conducted under its Standards or Guidelines will be nonhazardous or free from risk.

**ASHRAE INDUSTRIAL ADVERTISING POLICY ON STANDARDS**

ASHRAE Standards and Guidelines are established to assist industry and the public by offering a uniform method of testing for rating purposes, by suggesting safe practices in designing and installing equipment, by providing proper definitions of this equipment, and by providing other information that may serve to guide the industry. The creation of ASHRAE Standards and Guidelines is determined by the need for them, and conformance to them is completely voluntary.

In referring to this Standard or Guideline and in marking of equipment and in advertising, no claim shall be made, either stated or implied, that the product has been approved by ASHRAE.

**(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objections on informative material are not offered the right to appeal at ASHRAE or ANSI.)**

## FOREWORD

*Bronchoscopy procedures are performed in many locations depending on clinical need, which may mean that they are not performed under ventilation conditions currently specified in ANSI/ASHRAE/ASHE Standard 170 (i.e., for patients in an ICU setting who cannot be moved, or in an operating room as needed by a patient undergoing surgery). The listing in Standard 170 should specify the minimum requirements for ventilation provided in a room designed as a dedicated space for performing bronchoscopies (and/or other procedures such as endoscopy, which may be performed in a negative pressure environment). This addendum adds the word “room” after “bronchoscopy” in Tables 7-1 and 8-1, as well as where rooms for bronchoscopy are mentioned in the text. Additionally, reference to bronchoscopy rooms was removed from Note (p) for Tables 7-1 and 8-1, as it was deemed unnecessary.*

*Sputum collection and pentamidine administration are currently included on the same line as bronchoscopy in Table 7-1. These cough-inducing or aerosol-generating procedures, as indicated by FGI, require ventilation precautions for patients that may have infectious *Mycobacterium tuberculosis* (TB). Health care facilities do not typically design spaces or rooms dedicated to either of these procedures. Prior to sputum collection, facilities should operationalize administrative, environmental, and respiratory protection controls for inpatient settings in which patients with suspected or confirmed infectious TB disease are expected to be encountered, per CDC Guidelines;<sup>1</sup> primary environmental controls using source control (e.g., hoods, tents, or booths) with local exhaust are preferable to secondary controls such as using a specially designed room (e.g., AII room). Pentamidine administration is no longer common, but when it is used, CDC Guidelines<sup>1</sup> indicate screening protocols for TB and alternate treatment. This addendum removes “sputum collection and pentamidine administration” from tables and text and modifies bronchoscopy room notes to indicate that local exhaust be provided for sputum collection for patients with suspected or confirmed tuberculosis.*

*Due to equivalency in ventilation specifications for airborne infection control, AII rooms and bronchoscopy rooms require a dedicated exhaust stream (i.e., AII room air exhausted directly to outdoors), which can be shared among these room types. Addendum w adds language to indicate that the Exception to 6.3.2.2(a) for HEPA filtration applies to both of these airborne infection control room types and not just AII rooms.*

**Informative Note:** In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~striketrough~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

## Addendum w to Standard 170-2021

### Revise Section 6.3.2 as shown.

#### 6.3.2 Exhaust Discharges

**6.3.2.1 General.** Exhaust discharge outlets that discharge air from AII rooms, bronchoscopy rooms, ~~and sputum collection and pentamidine administration~~, emergency department public waiting areas, nuclear medicine hot labs, radiology waiting rooms programmed to hold patients who are waiting for chest x-rays for diagnosis of respiratory disease, pharmacy hazardous-drug exhausted enclosures, and laboratory work area chemical fume hoods shall

- a. be designed so that all ductwork within the building is under negative pressure.

**Exception to (a):** Ductwork located within mechanical equipment rooms. Positive- pressure exhaust ductwork located within mechanical equipment rooms shall be sealed in accordance with SMACNA duct leakage Seal Class A.

- b. be located such that they reduce the potential for the recirculation of exhausted air back into the building.

#### 6.3.2.2 Additional Requirements

1. Centers for Disease Control and Prevention. Guidelines for preventing the transmission of *Mycobacterium tuberculosis* in health-care facilities, 2005. MMWR 2005;54 (No. RR-17).

- a. Exhaust discharge outlets from AII rooms, bronchoscopy rooms, ~~and sputum collection exhaust~~, pharmacy hazardous-drug exhausted enclosures, and laboratory work area chemical fume hoods shall additionally be arranged to discharge to the atmosphere in a vertical direction (with no rain cap or other device to impede the vertical momentum) and meet the following:
  1. A discharge termination shall be a minimum of 10 ft (3 m) above service access level.
  2. Discharge termination shall be higher than any roof surface within 4 ft (1.2 m).
  3. Discharge termination shall be a minimum of 6 ft (1.8 m) from exterior walls.
  4. Discharge termination shall be a minimum of 30 ft (10 m) from outdoor air intakes, openable windows/doors, and areas that are normally accessible to the public.

**Exception to (a):**

1. All room and bronchoscopy room exhaust that first passes through a high-efficiency particulate air (HEPA) filter.
2. If permitted by the AHJ, an alternate location may be used (Informative Note: e.g., located adjacent to an air intake but with the exhaust discharge point above the top of the air intake). The submitted re-entrainment analysis shall demonstrate that an exhaust discharge outlet located at a distance less than 30 ft (10 m) horizontally provides a lower concentration of re-entrainment than all the areas located at a distance greater than 30 ft (10 m) horizontally on the roof level where the exhaust discharge is located.

**Revise Section 6.8.3 as shown.**

**6.8.3 Energy Recovery Systems with Leakage Potential.** If energy recovery systems with leakage potential are used, they shall be arranged to minimize the potential to transfer exhaust air directly back into the supply airstream. Energy recovery systems with leakage potential shall be designed to have no more than 5% of the total supply airstream consisting of exhaust air. Energy recovery systems with leakage potential shall not be used from these exhaust air- stream sources: emergency department waiting rooms, triage, emergency department decontamination, radiology waiting rooms, darkroom, bronchoscopy rooms, ~~sputum collection and pentamidine administration~~, laboratory fume hood and other directly ducted laboratory equipment exhaust, waste anesthesia gas disposal, autopsy, nonrefrigerated body holding, endoscope cleaning, central medical and surgical supply soiled or decontamination room, laundry general, hazardous material storage, dialyzer reprocessing room, nuclear medicine hot lab, nuclear medicine treatment room, and any other space identified by the AHJ or the infection control risk assessment (ICRA) team.

**Revise Table 7-1, “Design Parameters—Inpatient Spaces” as shown.**

| Function of Space (ee)   |
|--|
| DIAGNOSTIC AND TREATMENT   |
| Bronchoscopy <u>room</u> , <del>sputum collection, and pentamidine administration</del> (FGI 2.2–3.9.2) (n), (x) |

**Revise Normative Notes for Table 7-1 as shown.**

[ . . . ]

- 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.

[ . . . ]

- 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 room, ~~sputum collection, and pentamidine administration~~” shall be used.

**Revise Section 7.2.1 as shown.**

**7.2.1 Airborne Infection Isolation (AII) Rooms.**

[ . . . ]

- b. All exhaust air from the AII rooms, associated anterooms, and associated toilet rooms shall be discharged by one of the following methods:
  1. Discharged directly to the outdoors mixing only with exhaust from other spaces designed for airborne infection control (e.g., AII rooms, bronchoscopy rooms, emergency department waiting areas).

Air shall not be mixed without mixing with exhaust air from any other non-AH airborne infection control room or general exhaust system.

2. Discharged into the general exhaust stream, provided the AH exhaust air first passes through a HEPA filter. The HEPA filter, including ductwork and fans, shall be under negative pressure (suction side) for any supplemental fan used to account for filter pressure drop, and all exhaust ductwork shall be kept under negative pressure in accordance with Section 6.3.2.1. (Informative Note: If fans are used/needed due to static pressure drop of HEPA filtration, consideration should be given to the fan operation being inter-locked with the general exhaust system fan. Alarms for filter loading and fan failure should be considered.)

**Revise Section 7.3.1 as shown.**

### **7.3.1 Bronchoscopy Room**

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

**Revise Table 8-1, “Design Parameters—Specialized Outpatient Spaces” as shown.**

|  |
|--|
| DIAGNOSTIC AND TREATMENT                           |
| [ . . . ]  |
| Bronchoscopy <u>room</u> (FGI 2.1–3.2.2.1) (n) (x) |

**Revise Normative Notes for Table 8-1 as shown.**

- 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 room, ~~sputum collection, and pentamidine administration~~” shall be used.

[ . . . ]

- 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.

**Revise Section 8.2.1 as shown.**

### **8.2.1 Bronchoscopy Room**

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

## **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 · Peachtree Corners, GA 30092 · [www.ashrae.org](http://www.ashrae.org)**

## **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](http://www.ashrae.org/standards), and connect on LinkedIn, Facebook, Twitter, and YouTube.

## **Visit the ASHRAE Bookstore**

ASHRAE offers its Standards and Guidelines in print, as immediately downloadable PDFs, and via ASHRAE Digital Collections, which provides online access with automatic updates as well as historical versions of publications. Selected Standards and Guidelines are also offered in redline versions that indicate the changes made between the active Standard or Guideline and its previous version. For more information, visit the Standards and Guidelines section of the ASHRAE Bookstore at [www.ashrae.org/bookstore](http://www.ashrae.org/bookstore).

## **IMPORTANT NOTICES ABOUT THIS STANDARD**

**To ensure that you have all of the approved addenda, errata, and interpretations for this Standard, visit [www.ashrae.org/standards](http://www.ashrae.org/standards) to download them free of charge.**

**Addenda, errata, and interpretations for ASHRAE Standards and Guidelines are no longer distributed with copies of the Standards and Guidelines. ASHRAE provides these addenda, errata, and interpretations only in electronic form to promote more sustainable use of resources.**