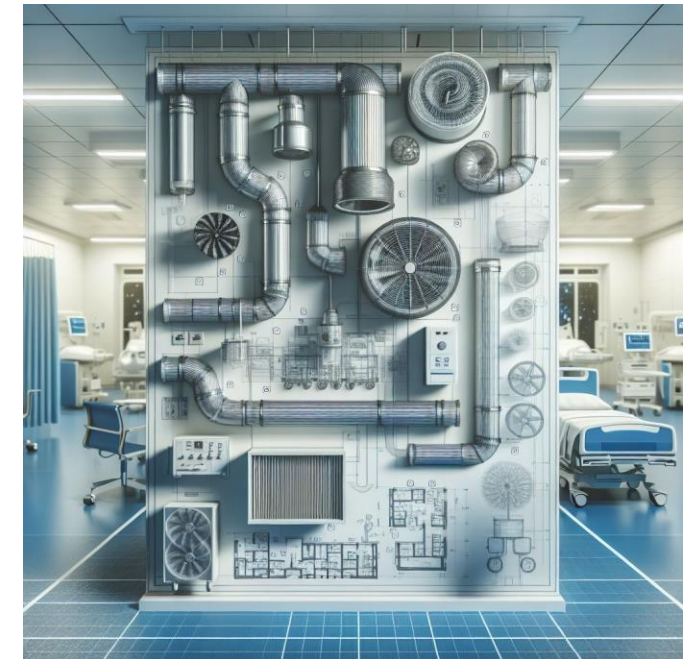
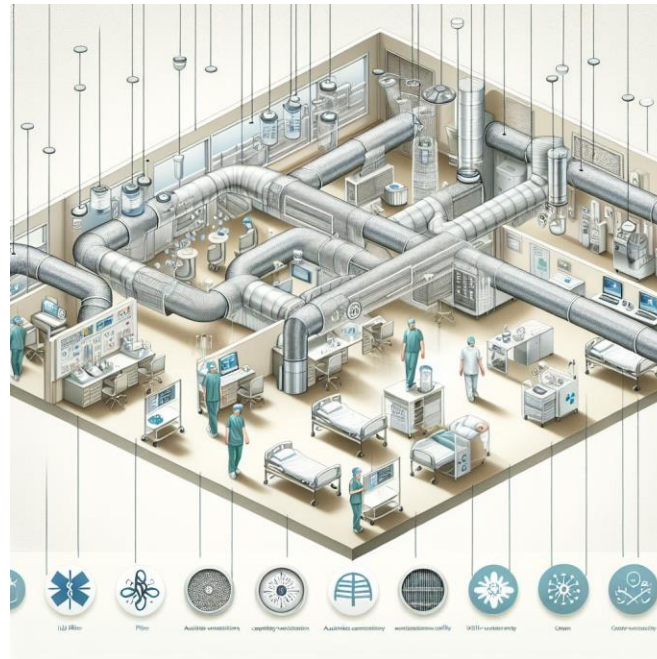


# A Living, Breathing Ventilation Standard for Healthcare - ASHRAE 170-2021/2025



# WHO AM I?



## **Justin M. Opperman, PE, LEED AP**

Shared Asset Administrator, Department of Radiology, Mayo Clinic

8+ years Mechanical Engineer, Design Engineers

4+ years Mechanical Engineer, Mayo Clinic

5+ years Project Manager, Mayo Clinic

BSME from Iowa State University

MEM from University of Nebraska – Lincoln

Member of ASHRAE TC 9.6

Voting Member of ASHRAE SSPC 170



# LEARNING OBJECTIVES



## **Understand the Rationale**

Explain the reasons behind the updates and addenda to the 2021 edition of ASHRAE 170, highlighting the latest research and technological advancements that influenced these changes.

## **Identify Key Changes**

Identify and describe the most significant changes and additions in the 2021 edition, focusing on how these updates improve ventilation standards in health care facilities.

## **Impact on Design and Operation**

Analyze how the new addenda affect the design, operation, and maintenance of ventilation systems in health care settings, ensuring compliance with the updated standards.

## **Enhancing Infection Control**

Discuss the enhanced guidelines for infection control, including updated requirements for air filtration, pressure relationships, and air changes per hour, and their importance in preventing the spread of infections.

## **Implementation Strategies**

Provide practical strategies and best practices for implementing the new standards in existing and new health care facilities, ensuring a smooth transition and optimal indoor air quality.





# AGENDA

1. What even IS ASHRAE 170?
2. How does 170 work?
3. Current 170-2021 growth
4. Maturing to 170-2025





# AGENDA

1. **What even IS ASHRAE 170?**
2. How does 170 work?
3. Current 170-2021 growth
4. Maturing to 170-2025



# WHAT EVEN IS ASHRAE 170?



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# WHAT EVEN IS ASHRAE 170?

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## STANDARD

**ANSI/ASHRAE/ASHE Standard 170-2021**  
(Supersedes ANSI/ASHRAE/ASHE Standard 170-2017)  
Includes ANSI/ASHRAE/ASHE addenda listed in Appendix F











# Ventilation of Health Care Facilities

See Appendix F for approval dates by the ASHRAE Standards Committee, the ASHRAE Board of Directors, the ASHE Board of Directors, and the American National Standards Institute.

This Standard is under continuous maintenance 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 (<https://www.ashrae.org/continuous-maintenance>).

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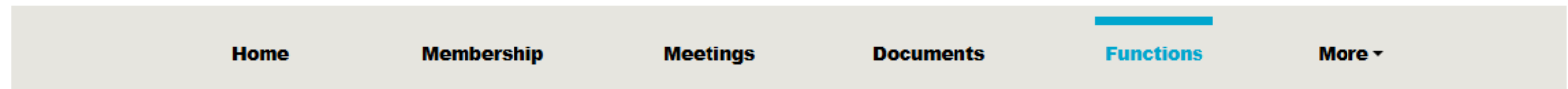
## Most Popular ASHRAE Standards and Guidelines

-  **1. Energy Benchmarks**  
**ANSI/ASHRAE/IES 90.1-2022 (I-P)**  
2022 / 464 pages
-  **2. Ventilation and IAQ**  
**ANSI/ASHRAE 62.1-2022**  
2022 / 86 pages
-  **3. Health Care**  
**ANSI/ASHE/ASHRAE 170-2021**  
2021 / 50 pages
-  **4. Legionellosis**  
**ANSI/ASHRAE 188-2021**  
2021 / 24 pages
-  **5. Sequences of Operation**  
**Guideline 36-2021**  
2021 / 284 pages
-  **6. Thermal Comfort**  
**ANSI/ASHRAE 55-2020**  
2020 / 76 pages
-  **7. Refrigerants**  
**ANSI/ASHRAE 15 and 34-2022**  
2022 / Two-standard set
-  **8. Commissioning**  
**ANSI/ASHRAE/IES 202-2018**  
2018 / 50 pages
-  **9. BACnet**  
**ANSI/ASHRAE 135-2020**  
2020 / 1428 pages
-  **10. HVAC Systems**  
**ANSI/ASHRAE 180-2018**  
2018 / 38 pages

# WHAT EVEN IS ASHRAE 170?



Healthcare Facilities  
ASHRAE Technical Committee 9.6



## Scope of TC 9.6

TC 9.6 is concerned with the application of ventilating, air-conditioning, refrigeration, life safety, and energy conservation systems to healthcare (hospital, outpatient, long-term care) facilities.

TC 9.6 has additional specialized subcommittees: Energy, Infectious Diseases, and Water. See the Home Page for meeting times of these subcommittees.

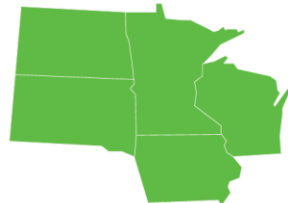
» [Handbook](#)

The ASHRAE Handbook is published in a series of four volumes, one of which is revised each year, ensuring that no volume is older than four years.

## 2023 HVAC Applications

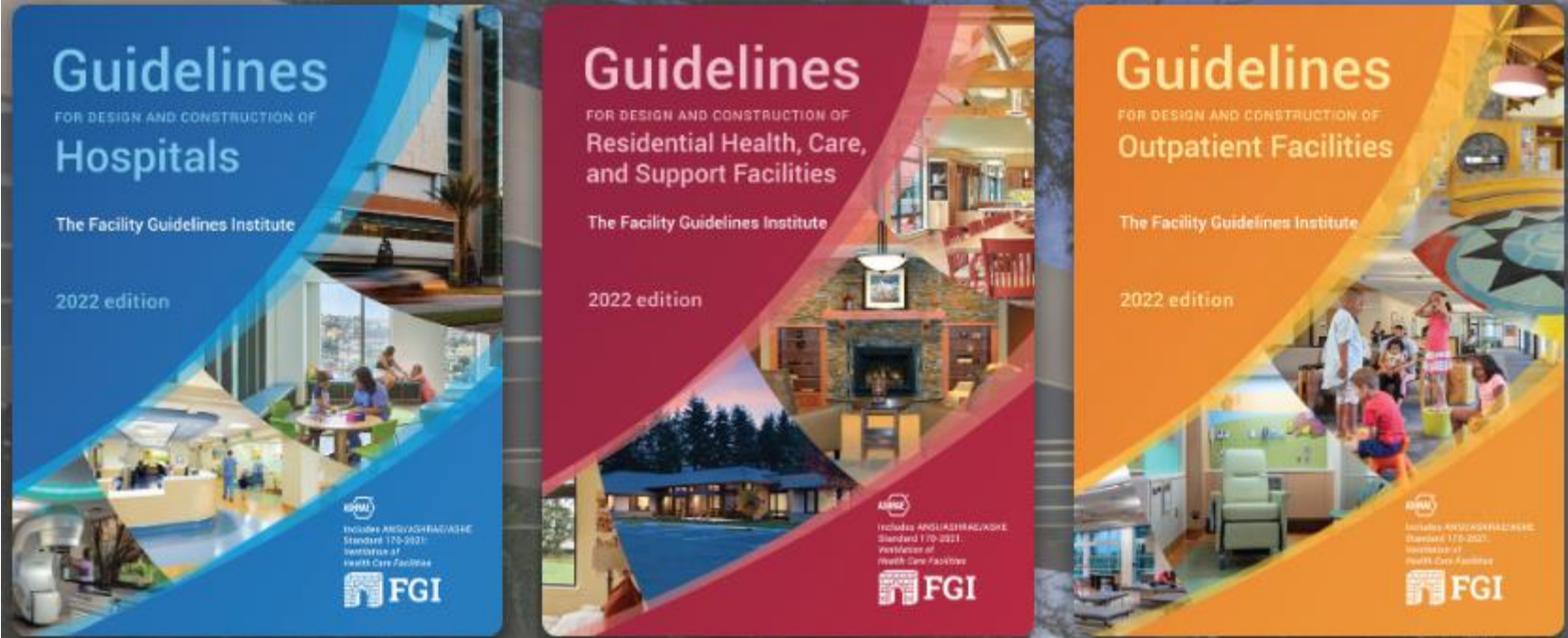
		2019			2020			2021			2022			2023					
		Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul
Review	Current HB received (June 1)			June 1															
	TC selects HB subcom and chair Review current HB for changes						Feb 1				Jul 1								
Revise	Decide extent of and outline revisions						Jul 1												
	Seek and appoint reviser(s) Revise chapter(s)							Feb 1				Feb 1							
Approve	Send revised chapter to TC for review																		
	TC approves chapter																		
	Send chapter to HBC liaison																		
Edit & Produce	HQ sends chpt. proof to TC contact																		
	HB sent to printer (April 1)																		Mar 15
	HB mailed (May 15)																		Apr 1    M 15

REGION 6



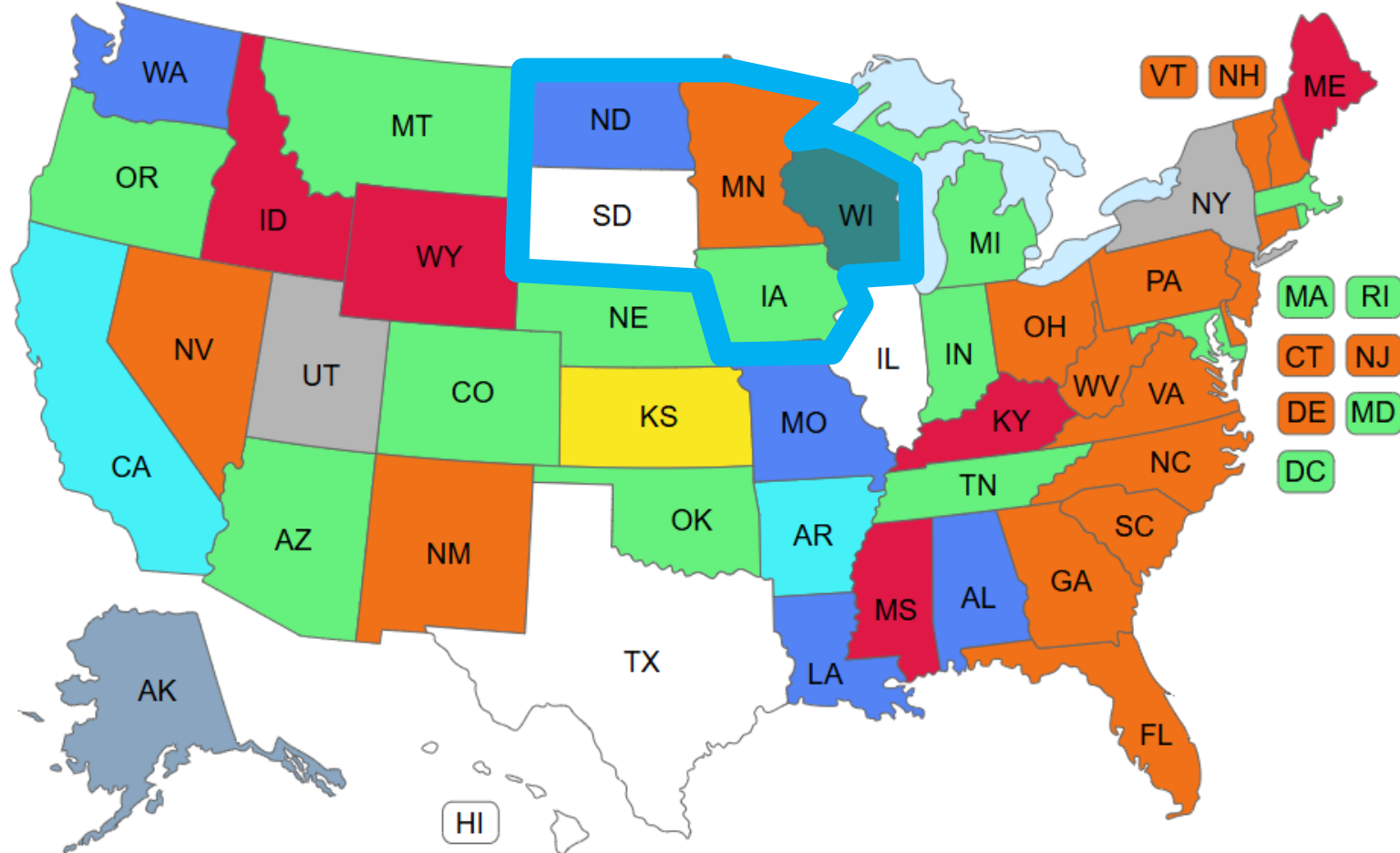




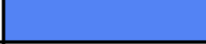






# WHAT EVEN IS ASHRAE 170?



# WHAT EVEN IS ASHRAE 170?

Last updated 8/21/24



Key	
2022	
2018	
2014	
2010	
2006	
2001	
1996-97	
Equivalency*	
HVAC Only	

# WHAT EVEN IS ASHRAE 170?

## Other Regulatory Applications of the *Guidelines*

**Centers for Medicare and Medicaid Services. CMS** has adopted by regulation the 2012 editions of the National Fire Protection Association (NFPA) 101: *Life Safety Code* and NFPA 99: *Health Care Facilities Code*. Otherwise, CMS regulation 482.41 requires hospitals to be constructed, arranged, and maintained to ensure the safety of the patient, and to provide facilities for diagnosis and treatment and for special hospital services appropriate to the needs of the community. To achieve this, CMS requires facilities to be in accordance with acceptable standards of practice, but leaves it up to the health care organization to determine which design standard to utilize.

**DNV.** In its hospital accreditation standards, this national health care accreditation organization states that hospitals must follow the current edition of the FGI Guidelines.

**The Joint Commission. EC.02.06.05 EP 1** states when planning new, altered, or renovated space, hospitals are to use design criteria in accordance with either state rules and regulations or the most current edition of the FGI *Guidelines for Design and Construction of Hospitals*. When these rules, regulations, and guidelines do not meet specific design needs, use of other reputable standards and guidelines that provide equivalent design criteria may be acceptable. The Joint Commission references use of the most recent version of the FGI Outpatient (ambulatory) and Residential *Guidelines* for these types of facilities. Typically, the state health department licensing entity is the authority having jurisdiction (AHJ), so health care organizations should check the AHJ's licensing rules to determine the criteria for a facility. 10/18/23



# AGENDA

1. What even IS ASHRAE 170?
2. **How does 170 work?**
3. Current 170-2021 growth
4. Maturing to 170-2025



# HOW DOES ASHRAE 170 WORK?

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## STANDARD

**ANSI/ASHRAE/ASHE Standard 170-2021**  
(Supersedes ANSI/ASHRAE/ASHE Standard 170-2017)  
Includes ANSI/ASHRAE/ASHE addenda listed in Appendix F

# Ventilation of Health Care Facilities

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## Ventilation of Health Care Facilities

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### Agenda

- SSPC 170 Agenda 2024 Chicago
- SSPC 170 Agenda 2023 Tampa
- SSPC 170 Agenda Interim
- SSPC 170 Agenda 2023 Atlanta
- SSPC 170 Agenda 2022 Toronto

### Upcoming PC Meetings

Hybrid Event

In Person - Hilton Orlando, FL

Virtual - Teams ( with links for meeting information hyperlinked below

(All meeting are listed in Eastern Time)

**Monday, 02/10/2025, Hilton Orlando, Florida 1&2 (Lower Level)**

3:00pm - 6:00pm Main Meeting 1 (Meeting ID: 291 622 034 297 Passcode: 3H6zXt )

**Tuesday, 02/11/2025, Hilton Orlando, Orange D (Lower Level)**

### Committee Chair

Mr Jeremy P Fauber, PE

### Webmaster

Mr George A. Augustini

### Upcoming Society Conferences

ASHRAE 2025 Annual Conference  
June 21-25, 2025  
Phoenix, AZ

<https://www.ashrae.org/conferences/2025-annual-conference-phoenix>



# HOW DOES ASHRAE 170 WORK?

## 1. PURPOSE

The purpose of this standard is to define ventilation system **design requirements** that provide environmental control in health care facilities.





# HOW DOES ASHRAE 170 WORK?

## 2. SCOPE

**2.1** The requirements in this standard apply to patient care areas, resident care areas, and related support areas within health care facilities.

**2.2** This standard applies to new buildings, additions to existing buildings, and those alterations to existing buildings that are identified within this standard.

**2.3** This standard considers chemical, physical, and biological contaminants that can affect the delivery of medical care to patients and residents; the convalescence of patients and residents; and the safety of patients, residents, health care workers, and visitors.

**2.4** This standard establishes design requirements for temperature and humidity.

**2.5** This standard establishes design requirements for odor control and asepsis.

**2.6** This standard establishes design requirements for ventilation rates, including, but not limited to, outdoor air to serve health care facilities.

# HOW DOES ASHRAE 170 WORK?

## Member Roster

Current as of 2/28/2025

[How to Join a PC](#) >

Winter Meeting (hybrid)

Conference Call

Interim Meeting (in-person)

Conference Call

Summer Meeting (hybrid)

Conference Call

Interim Meeting (in-person)

Conference Call

+ad hoc subcommittee / workgroups

Show 10 entries

Search:

Name ↑↓	Voting Status ↑↓	Committee Position ↑↓
Aaron Johnson	Voting	Secretary; PcvM-Designer; Administration Subcommittee
Abdel Darwich	Non-voting	Spls Liaison; Sspc 62.1 Liaison
Adel Rizkalla	Non-voting	PsvM-Infection Control Practitioner; Research And Education Subcommittee
Amit Bhansali	Voting	PcvM-Designer; Chair, Interpretations Subcommittee
Amy Courtney	Non-voting	PsvM-Infection Control Practioner; Standards And Correlation Subcommittee
Brendon Burley	Non-voting	PsvM-Designer; Research And Education Subcommittee
Brian Abel	Non-voting	PsvM-Producer; Guideline 43 Subcommittee
Caleb Haynes	Non-voting	PsvM-Designer; Guideline 43 Subcommittee
Carl Schultz	Non-voting	PsvM-Designer; Interpretations Subcommittee
Charles Seyffer	Non-voting	PsvM-General; Guideline 43 Subcommittee

Showing 1 to 10 of 67 entries

# HOW DOES ASHRAE 170 WORK?

## Standard 170-2008

Interpretations for Standard 170-2008

---

## Standard 170-2013

Interpretation for Standard 170-2013

---


## Standard 170-2017


Interpretation for Standard 170-2017


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## Standard 170-2021


Interpretations for Standard 170-2021


 [Interpretation 170-2021-1 – September 16, 2021](#) (Refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2021, Section 3, regarding definition alignment with FGI Guidelines.)

 [Interpretation 170-2021-2 – February 1, 2022](#) (Refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2017, Table 6-2, regarding the definition and requirements for “procedure room”.)

 [Interpretation 170-2021-3 – February 1, 2022](#) (Refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2021, Section 7.2.1 and Table 7.1, regarding exhaust air requirements when Airborne Infectious Isolation (AII) room not used for airborne infection isolation.)

 [Interpretation 170-2021-4 – February 6, 2023](#) (Refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2021, Sections 7 and 8; Tables 6-2, 7-1 and 8-1; and Addendum d, regarding Class 2 imaging rooms.)

 [Interpretation 170-2021-5 – January 23, 2024](#) (Refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2021, Sections 6.7.2.a and 7.1.a.5, Tables 6-2 and 7-1, regarding supply air outlet requirement on recirculating room HVAC units.)

 [Interpretation 170-2021-6 – October 11, 2024](#) (Refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2021, Section 6.3.1.1 and Table 6-1, regarding Air Intake Separation Distance – gas-fired RTU.)



# HOW DOES ASHRAE 170 WORK?

**Johnson, Aaron**

**From:** Jeremy P. Fauber <JPFauber@heapy.com>  
**Sent:** Saturday, February 18, 2023 11:02 AM  
**To:** Lucht.douglas@mayo.edu  
**Cc:** mweber@ashrae.org; phillip.johnson@daikinapplied.com; Steven D Friedman - Memorial Sloan Kettering Cancer Center (sdfpe65@gmail.com); Johnson, Aaron  
**Subject:** Request for Unofficial Interpretation of 170-2021

Mr. Lucht,  
  
Thank you for your interest in ANSI/ASHRAE/ASHE Standard 170. Please see responses below.  
  
Thank you,  
  
Jeremy

**Request from:** Douglas A. Lucht, P.E. ([Lucht.douglas@mayo.edu](mailto:Lucht.douglas@mayo.edu)), Mayo Foundation for Medical Education and Research, 200 First St. SW Rochester, MN 55905.

**Reference:** This request for interpretation refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2021, Table 7-1, regarding Normative Note p.

## **Background:**

The space function category for Class 2 Imaging Rooms in Table 7-1 of ANSI/ASHRAE/ASHE 170-2021 directs the reader to Normative Note p., which states below.

*"Treatment rooms used for procedures with nitrous oxide shall contain provisions for exhausting anesthetic waste gases."*

It is unclear to us what is meant by "provisions for exhausting anesthetic waste gases". Does this mean that low returns (or exhausts) are required in Class 2 Imaging Rooms when nitrous oxide is present, or does a Waste Anesthesia Gas Disposal system satisfy this requirement? If a low return is required, are two of them required, or is one sufficient?

**Interpretation No. 1:** Two low return (or exhaust) air grilles are not required in Class 2 Imaging Rooms where nitrous oxide is used if the room is equipped with a Waste Anesthesia Gas Disposal system.

**Question (1):** Is this interpretation correct?

**Response:** YES

**Interpretation No. 2:** Two low return (or exhaust) air grilles are required in Class 2 Imaging Rooms where nitrous oxide is used regardless of if the room is equipped with a Waste Anesthesia Gas Disposal system.

**Question (2):** Is this interpretation correct?

**Response:** NO

**Interpretation No. 3:** A single low return (or exhaust) air grille is not required in Class 2 Imaging Rooms where nitrous oxide is used if the room is equipped with a Waste Anesthesia Gas Disposal system.

**Question (3):** Is this interpretation correct?

**Response:** YES

**Interpretation No. 4:** A single low return (or exhaust) air grille is required in Class 2 Imaging Rooms where nitrous oxide is used regardless of if the room is equipped with a Waste Anesthesia Gas Disposal system.

**Question (4):** Is this interpretation correct?

**Response:** NO

**Jeremy Fauber, PE, CGD, LEED AP BD+C**

Principal | Engineering Manager

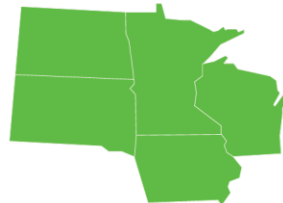
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REGION 6



# HOW DOES ASHRAE 170 WORK?

**Filters**

Committee:  
SSPC170

Base Standard/Guideline:  
170-2021-Standard

---

**Results**

Draft Proposals: 0  
Total Proposals: 20  
Distinct Proposers: 11

By Proposal Status:

- Staff Review: 0
- Committee Review: 4
- Responded To: 16

Comm Response:

- Accepted without Mod: 2
- Accepted with Mod: 6
- Accepted for Further Study: 0
- Rejected: 8

Responses in Progress:

- Draft Responses: 0
- Ready for Approval: 0

## My Committee Proposals

Filtered to Proposals Submitted But Not Yet Responded To

Take Proposals Offline

NEW PROPOSAL



Standard ▼ ✕

<input type="checkbox"/>	Proposal Title	Section	Pr #	PI #	Proposal Status	Submitted	Comm Response	Response Status	Created By	Response Email
▼ Standard: 170-2021 Ventilation of Health Care Facilities										
<input type="checkbox"/>	To Allow for Alternative Designs for Primary Supply Diffuser Array	7.4.1(b) Surgery Rooms Airflow and Coverage, paragraph b	0012	001	Submitted	02/27/2025			kwarye@infectionpreven	
<input type="checkbox"/>	Reduce Design Operating Room Air Change Rates to 12 ACH	Tables 7-1 and 8-1	0011	001	Submitted	04/03/2024			fred.betz@neumodlabs.	
<input type="checkbox"/>	Reduce Operational Operating Room Air Change Rates to 12 ACH	Tables 7-1 and 8-1	0011	002	Submitted	04/03/2024			fred.betz@neumodlabs.	

# HOW DOES ASHRAE 170 WORK?

Request For Interpretation (informal or formal) → document change  
Continuous Maintenance Proposal → document change  
Committee action → document change  
Research → document change

2021

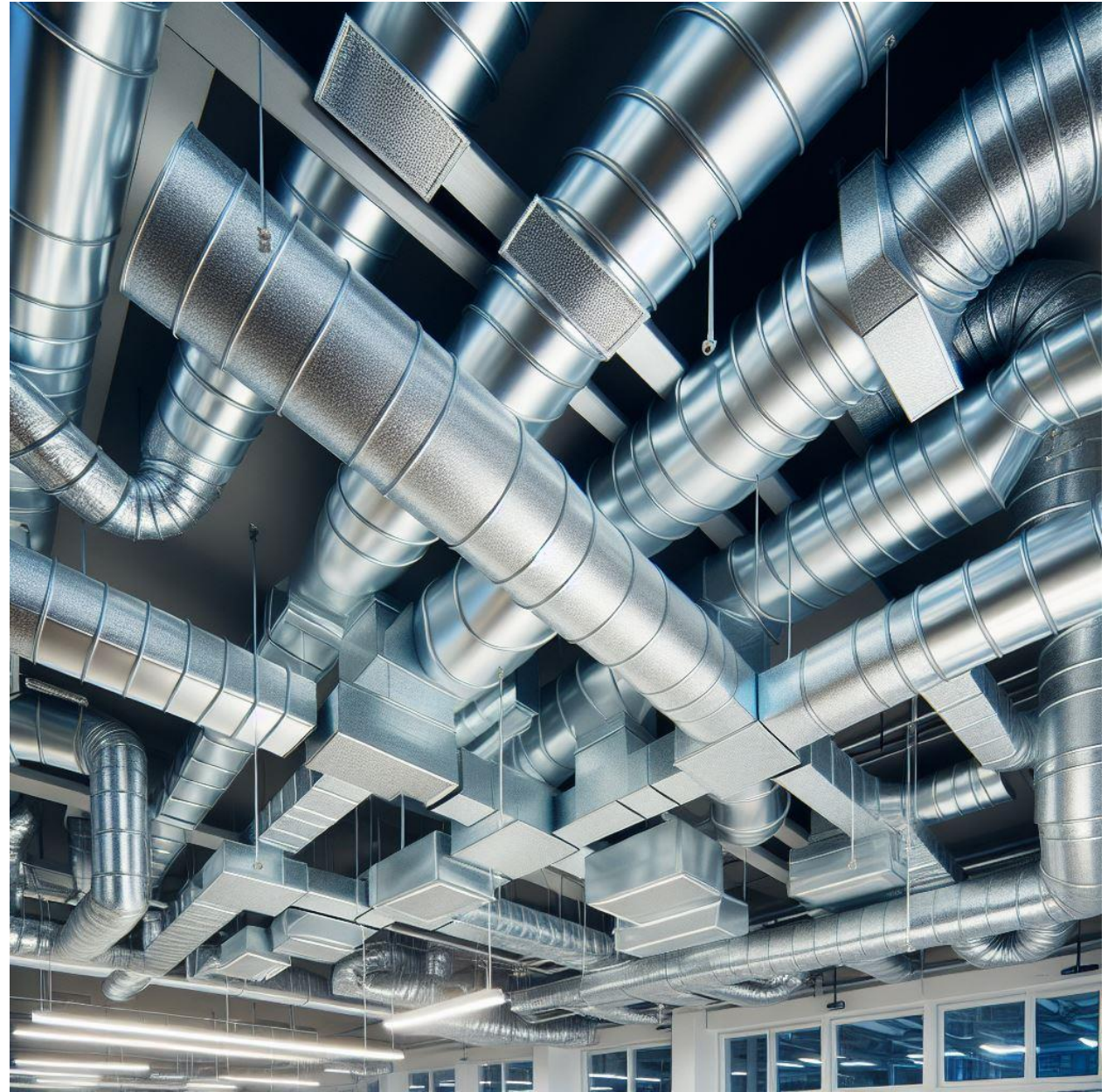
-  [Addenda c to Standard 170-2021 \(July 30, 2021\)](#)
-  [Addendum d to Standard 170-2021 \(October 29, 2021\)](#)
-  [Addendum e to Standard 170-2021 \(September 30, 2022\)](#)
-  [Addendum f to Standard 170-2021 \(July 5, 2022\)](#)
-  [Addendum g to Standard 170-2021 \(September 30, 2022\)](#)
-  [Addendum h to Standard 170-2021 \(September 30, 2022\)](#)
-  [Addendum i to Standard 170-2021 \(December 29, 2023\)](#)
-  [Addendum j to Standard 170-2021 \(July 31, 2023\)](#)
-  [Addendum k for Standard 170-2021 \(November 29, 2024\)](#)
-  [Addendum l to Standard 170-2021 \(December 29, 2023\)](#)
-  [Addendum n to Standard 170-2021 \(May 31, 2024\)](#)
-  [Addendum o to Standard 170-2021 \(June 28, 2024\)](#)
-  [Addendum p to Standard 170-2021 \(August 30, 2024\)](#)
-  [Addendum q to Standard 170-2021 \(August 30, 2024\)](#)
-  [Addendum r for Guideline 170-2021 \(November 29, 2024\)](#)





# AGENDA

1. What even IS ASHRAE 170?
2. How does 170 work?
3. **Current 170-2021 growth**
4. Maturing to 170-2025



# CURRENT ASHRAE 170 GROWTH

## FOREWORD

*Addendum d changes to Section 3, “Definitions,” align Standard 170 requirements with FGI’s evolving clinical approaches to care and treatment of patients in imaging settings.*

**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 d to Standard 170-2021

*Revise Section 3 as shown. The remainder of Section 3 is unchanged.*

**Class 1 imaging room:** an imaging room designated for the performance of patient care activities, including diagnostic radiography, fluoroscopy, mammography, computed tomography (CT), ultrasound, magnetic resonance imaging (MRI), nuclear medicine, and other imaging modalities, including services that use natural orifice entry and do not pierce or penetrate natural protective membranes.

**Class 2 imaging room:** an imaging room designated for the performance of patient care activities, including diagnostic and therapeutic procedures such as coronary, neurological, or peripheral angiography, including electrophysiology, cardiac catheterization, and interventional angiography and similar procedures.

**Class 3 imaging room:** an imaging room designated for the performance of patient care activities, including invasive procedures ~~including cardiac stenting, implantation of devices in an invasive fluoroscopy,~~ and any other Class 2 procedure during which the patient will require physiological monitoring and is anticipated to require active life support.

**~~procedural invasive~~ fluoroscopy:** therapeutic or diagnostic ~~invasive~~ procedures that require fluoroscopic imaging (e.g., cardiac catheterization, interventional angiography, cardiac stenting, or implantation of devices). (**Informative Note:** These procedures are typically performed in a restricted or semirestricted area based on the classification of the imaging procedure being performed. ~~Refer also to Class 2 imaging room for cardiac catheterization or interventional angiography and Class 3 imaging room for cardiac stenting or implantation of devices.~~)

## FOREWORD

*Addendum c filter changes align Standard 170 requirements with FGI requirements for residential health care facilities.*

## FOREWORD

*Addendum e allows natural ventilation for certain limited health care spaces and under certain conditions. ASHRAE Standard 62.1’s Natural Ventilation Procedure, which was completely revised in 2019, was used as a starting point for this addendum.*

## FOREWORD

*Healthcare facilities often have a mixture of spaces within the scope of Standard 170 and Standard 62.1. Although Standard 170 gives the option to use the Standard 62.1 Ventilation Rate Procedure for outdoor air calculation, there is no clear direction on how to calculate the total outdoor air at the system levels for systems serving both 170 and 62.1 spaces. Addendum f clarifies how to calculate this. A working group of members from both SSPC170 and SSPC62.1 investigated the use of four possible calculation methods and selected the most appropriate method, which was tested on 14 actual healthcare projects*

# CURRENT ASHRAE 170 GROWTH

## FOREWORD

*Addendum g revises portions of Sections 3, 6, 7, and 8 to provide clarity of intent and/or correct five elements (indicated below) of the current standard. It also follows the continuous maintenance process in further coordination with FGI and SSPC 170 to result in a coordinated document for use by all stakeholders in the health care community.*

*Addendum g comprises the following general edits:*

- *New definition for hybrid operating room*
- *Revisions to Table 6-2 relating to coordinating the recent Class 2 and 3 imaging rooms to their associated operating rooms and procedure rooms and correlating supply air outlets*
- *Revisions to Sections 7 and 8 coordinating the nuclear medicine treatment space to align Tables 7-1 and 8-1 (and associated footnotes) along with minor edits to Section 8.7 and adding a new Section 7.7 matching Section 8.7*
- *Minor edits to Table 7-1 correcting an error (opposite switch) from outdoor air and total air changes per hour for seclusion room*

## 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.*

## FOREWORD

*Health care facilities can have a complex variety of roof conditions that must be considered when locating exhaust air discharges. There are several exhaust system typologies at these facilities that require special consideration to protect maintenance personnel and minimize re-entrainment. These conditions may include sloped roofs, variations in roof height, termination with regard to exterior walls, and proximity to outdoor air intakes and operable doors and windows. Addendum i provides clarity on how to address these varied complex situations.*

## FOREWORD

*Standard 170 currently addresses single-occupancy patient care spaces for behavioral health settings in hospitals but does not address spaces where multiple patients assemble. Addendum j addresses the pressure relationship, ventilation, filtration, temperature, and humidity requirements for behavioral health multiple-patient assembly areas by adding to Table 7-1.*





# CURRENT ASHRAE 170 GROWTH

## FOREWORD

*Addendum k updates the heading of Section 6.1.2 to clarify the section applies to the central systems that provide cooling or heating. The addendum also adds requirement for cooling reserve capacity in addition to the heating reserve capacity for spaces already listed in Section 6.1.2. This provides guidance to designers to a minimum reserve capacity required to start with and engage with the facility on what their operational needs are. The addendum also removes the onsite fuel requirement from Section 6.1.2.1 so that the exception to 6.1.2.1 does not apply to it anymore. The requirement is added back to Section 6.1.2.2. The addendum removes the lower limit of 400 ton cooling load as the starting point for considering any reserve capacity for cooling in inpatient and residential health care facilities.*

## FOREWORD

*Section 10 of the standard provides requirements for protecting ventilation systems during construction. Addendum l revises this section to reorganize the subheadings, improving the sequencing of requirements temporally, from construction to start-up to operation prior to owner turnover; to more clearly describe precautions required when using the HVAC system in active construction areas; and to clarify that construction areas need to be maintained under negative differential pressure relative to occupied areas except where an ICRA has determined other appropriate protection measures.*

## FOREWORD

*The current requirements for HEPA filters in the standard are based on a testing protocol common in the United States; however, the availability of HEPA products tested to that standard is limited internationally. Addendum n adds other acceptable testing protocols for determining HEPA filter efficiency to allow for more international application of the standard.*

## FOREWORD

*Addendum o adds spaces to Table 7-1 that will help ANSI/ASHRAE/ASHE Standard 170 align with the 2022 FGI Guidelines for Design and Construction. These spaces or their equivalents were already included in Table 8-1. The values inserted into Table 7-1 were drawn directly from Table 8-1.*

## FOREWORD

*The committee evaluated the functional spaces across all tables in ANSI/ASHRAE/ASHE Standard 170-2021 to verify what differences existed and what evidential support was behind the differences. Several differences were verified by the working group, yet the only documented evidential support the work group could find for any of these differences was for certain resident spaces within Table 9-1, Design Parameters for Residential Health, Care, and Support-Specific Spaces. Therefore, Addendum p coordinates the necessary changes to align the requirements for similar functional spaces across the tables.*

## FOREWORD

*Addendum q adds a requirement that emergency conditions be considered in the design of the HVAC systems as well as an informative appendix to point users of ANSI/ASHRAE/ASHE Standard 170 to appropriate resources and procedures for consideration during design. The appendix includes specific information related to infectious events similar to the COVID-19 pandemic and is structured to allow for additional information to be added as it relates to other types of emergency conditions.*

## FOREWORD

*Addendum r revises Table 9-1, “Design Parameters for Residential Health, Care, and Support-Specific Spaces.”*



**Revise Table 7-1 as shown. The remainder of Table 7-1 is unchanged.**

**Table 7-1 Design Parameters—Inpatient Spaces (Continued)**

Function of Space (ee)	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 (cc)	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
[ . . . ]									
GENERAL SUPPORT FACILITIES: STERILE PROCESSING									
Clean assembly/workroom (FGI 2.1-5.1.2.2[3]) (z)	Positive	2	4	NR	No	No	<del>MERV-8 (gg)</del> MERV-14 (gg)	Max 60	68-73/20-23
Soiled workroom/decontamination room (FGI 2.1-5.1.2.2[2]) (z)	Negative	2	6	Yes	No	No	MERV-8	NR	60-73/16-23
Sterile storage room (clean/sterile medical/ surgical supplies) (FGI 2.1-5.1.2.2[4]) (z)	Positive	2	4	NR	NR	No	<del>MERV-8 (gg)</del> MERV-14 (gg)	Max 60	Max 75/24
<u>One-room sterile processing facility (FGI 2.1-5.1.2.3) (z) (ll)</u>	<u>NR</u>	<u>2</u>	<u>6</u>	<u>NR</u>	<u>No</u>	<u>No</u>	<u>MERV-14 (gg)</u>	<u>NR</u>	<u>NR</u>
<u>Sterilizer equipment room (FGI 2.1-5.1.2.2(1)(b)) (z)</u>	<u>Negative</u>	<u>NR</u>	<u>2</u>	<u>NR</u>	<u>NR</u>	<u>No</u>	<u>MERV-8</u>	<u>NR</u>	<u>NR</u>
<u>Clean/sterile medical/surgical supply receiving (FGI 2.1-5.1.2.4(2)) (z)</u>	<u>NR</u>	<u>NR</u>	<u>4</u>	<u>NR</u>	<u>No</u>	<u>No</u>	<u>MERV-8</u>	<u>NR</u>	<u>NR</u>
[ . . . ]									

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

[ . . . ]

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

[ . . . ]

ll. In accordance with FGI 2.1-5.1.2.1, one-room sterile processing facilities are permitted only under certain circumstances.

# CURRENT ASHRAE 170 GROWTH

*Revise Table 8-1 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 ©	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
[...]									
STERILE PROCESSING (aa)									
One-room sterile processing (FGI 2.1–4.3.2.3)	NR	2	6	NR	No	No	MERV-14 (ee)	NR	NR
Sterilizer equipment room (FGI 2.1–4.3.2.2) (kk)	Negative	NR	<del>10</del> 2	<del>Yes</del> NR	<del>No</del> NR	No	MERV-8	NR	NR
Clean workroom (FGI 2.1–4.3.2.2.3)	Positive	2	4	NR	No	No	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	No	MERV-14 (ee)	Max 60	72–78/22–26
Supply receiving (FGI 2.1–4.3.2.4) (kk)	<del>Negative</del> NR	NR	<del>10</del> 4	<del>Yes</del> NR	No	No	MERV-8	NR	NR
Decontamination room (FGI 2.1–4.3.2.2)	Negative	2	6	Yes	No	No	MERV-8	NR	60–73/16–23
[...]									

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

kk. Pressure relationship and room exhaust should be considered carefully by the designer with respect to connected adjacencies and general air movement from clean to dirty.



# CURRENT ASHRAE 170 GROWTH

## ASHRAE Publishes Standard 241, Control of Infectious Aerosols

### FOR IMMEDIATE RELEASE

#### MEDIA CONTACT:

Karen Buckley Washington  
Senior Public Relations Specialist  
[kbwashington@ashrae.org](mailto:kbwashington@ashrae.org)

**ATLANTA (July 7, 2023)** – ASHRAE has published its pioneering consensus-based, code enforceable standard, developed to reduce the risk of infectious aerosol transmission in buildings.

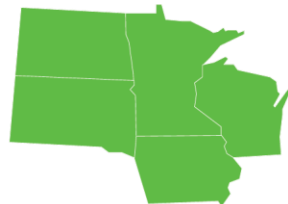
*ASHRAE Standard 241, Control of Infectious Aerosols* can be purchased at [ashrae.org/241](https://www.ashrae.org/241).

Standard 241 establishes minimum requirements to reduce the risk of airborne disease transmission, such as SARS-COV-2 virus, which causes *COVID-19*, the flu virus and other pathogens in buildings like single and multi-family homes, offices, schools and healthcare facilities. The standard applies to new and existing buildings and major renovations and provides requirements for many aspects of air system design, installation, operation and maintenance.

Important topics addressed in the standard:

- **Infection Risk Management Mode (IRMM)** – Establishes requirements for an infection risk management mode (IRMM), which applies during identified periods of elevated disease transmission risk. Authorities having jurisdiction can determine when the enhanced protections of Standard 241 are required. Resilience (the ability to respond to extreme circumstances outside normal conditions) in indoor air quality control design and operations is introduced.
- **Requirements for Equivalent Clean Airflow Rate** – Sets requirements for equivalent clean airflow rate target per occupant of pathogen free air flow, reducing the risk of infection.
- **Requirements for Use of Filtration and Air Cleaning Technology** – Provides extensive requirements for use of filtration and air cleaning (such as HEPA filters, air ionizers, or UV lights) to achieve equivalent clean airflow requirements and be cost effective effectively and safely.
- **Planning and Commissioning** – Provides assessment and planning requirements for being ready for the times when there is an event with increased disease causing pathogen transmissions. The standard has a *building readiness plan*, that documents procedures for assessing existing or new HVAC systems to determine if they are working properly and attributing to the equivalent clean air delivered to spaces.

**REGION 6**



# CURRENT ASHRAE 170 GROWTH

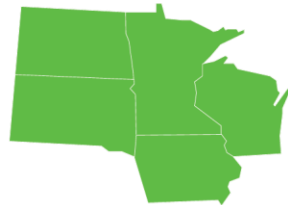
## FOREWORD

*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 ASHRAE 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 ASHRAE 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 the tables 7-1 and 8-1, as well as where rooms for bronchoscopy are mentioned in the text.*

*Sputum collection and pentamidine administration are currently included on the same line as bronchoscopy in 7-1. These cough-inducing or aerosol-generating procedures, as indicated by FGI, require ventilation precautions for patients that may have infectious Mycobacterium tuberculosis. The spaces these procedures are performed in are typically called Pulmonary Function Test (PFT) rooms, and for the reason mentioned previously, these rooms are sometimes designed with ventilation requirements for airborne infection control that are equivalent to a Bronchoscopy room or an Airborne Infection Isolation (AII) room. This addendum changes “sputum collection and pentamidine administration” to “Pulmonary Function Test room with airborne infection control” to signify the intention of this room to meet the FGI specification more clearly, and “sputum collection and pentamidine administration” have been moved to a footnote. Changes to in tables and text reflect this new naming.*

*Due to equivalency in ventilation specifications for airborne infection control, AII rooms, Bronchoscopy rooms, and PFT rooms with airborne infection control (i.e., for sputum collection and/or pentamidine administration) require a dedicated exhaust stream (i.e., AII Room Air Exhausted Directly to Outdoors), which can be shared among these room types. This addendum adds language to indicate that the Exception to 6.3.2.2(a) for HEPA filtration applies to all three of these airborne infection control room types, not just AII rooms.*

**REGION 6**



# CURRENT ASHRAE 170 GROWTH

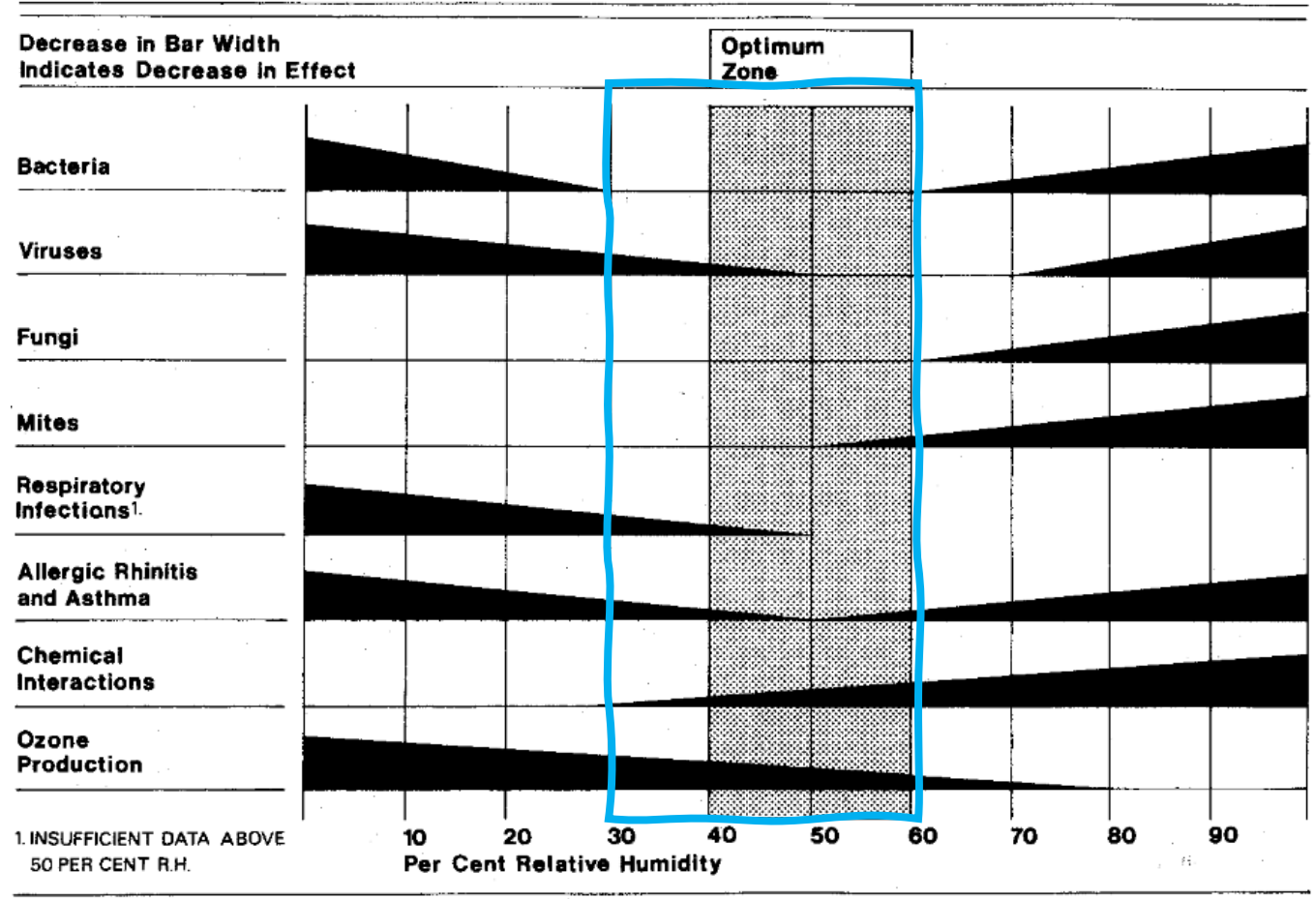
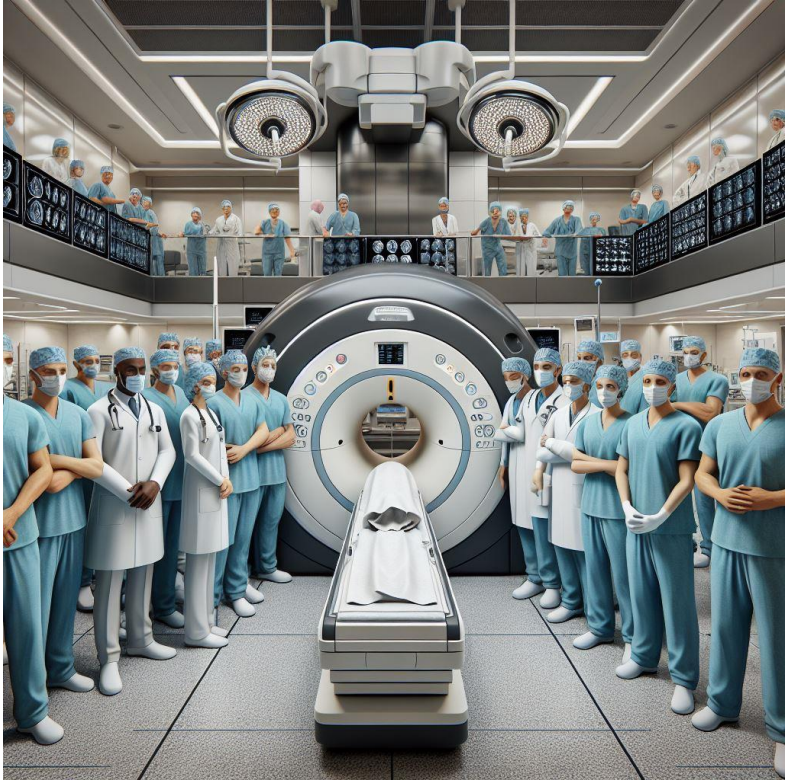


Figure 1. Optimum relative humidity ranges for health



# CURRENT ASHRAE 170 GROWTH

**Filters**

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Committee:  
 SSPC170 ▼

Base Standard/Guideline:  
 170-2021-Standard ▼

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**Results**

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Draft Proposals: 0  
 Total Proposals: 20  
 Distinct Proposers: 11

By Proposal Status:

- Staff Review: 0
- Committee Review: 4
- Responded To: 16

Comm Response:

- Accepted without Mod: 2
- Accepted with Mod: 6
- Accepted for Further Study: 0
- Rejected: 8

Responses in Progress:

- Draft Responses: 0
- Ready for Approval: 0

## My Committee Proposals

Filtered to Proposals Submitted But Not Yet Responded To

Take Proposals Offline

NEW PROPOSAL

Standard ▼ ✕


<input type="checkbox"/>	Proposal Title	Section	Pr #	PI #	Proposal Status	Submitted	Comm Response	Response Status	Created By	Response Email
▼ Standard: 170-2021 Ventilation of Health Care Facilities										
<input type="checkbox"/>	To Allow for Alternative Designs for Primary Supply Diffuser Array	7.4.1(b) Surgery Rooms Airflow and Coverage, paragraph b	0012	001	Submitted	02/27/2025			kwarye@infectionpreven	
<input type="checkbox"/>	Reduce Design Operating Room Air Change Rates to 12 ACH	Tables 7-1 and 8-1	0011	001	Submitted	04/03/2024			fred.betz@neumodlabs.	
<input type="checkbox"/>	Reduce Operational Operating Room Air Change Rates to 12 ACH	Tables 7-1 and 8-1	0011	002	Submitted	04/03/2024			fred.betz@neumodlabs.	


# CURRENT ASHRAE 170 GROWTH


- Informal
  - Domestic water heating capacity and fuel source (addendum k)
  - Room recirculation units (addendum m)
  - Class 3 imaging and primary array (via FGI)





# CURRENT ASHRAE 170 GROWTH


 [Interpretation 170-2021-1 – September 16, 2021](#) (Refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2021, Section 3, regarding definition alignment with FGI Guidelines.)

 [Interpretation 170-2021-2 – February 1, 2022](#) (Refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2017, Table 6-2, regarding the definition and requirements for “procedure room”.)

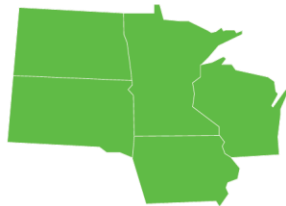
 [Interpretation 170-2021-3 – February 1, 2022](#) (Refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2021, Section 7.2.1 and Table 7.1, regarding exhaust air requirements when Airborne Infectious Isolation (All) room not used for airborne infection isolation.)

 [Interpretation 170-2021-4 – February 6, 2023](#) (Refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2021, Sections 7 and 8; Tables 6-2, 7-1 and 8-1; and Addendum d, regarding Class 2 imaging rooms.)

 [Interpretation 170-2021-5 – January 23, 2024](#) (Refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2021, Sections 6.7.2.a and 7.1.a.5, Tables 6-2 and 7-1, regarding supply air outlet requirement on recirculating room HVAC units.)

 [Interpretation 170-2021-6 – October 11, 2024](#) (Refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2021, Section 6.3.1.1 and Table 6-1, regarding Air Intake Separation Distance – gas-fired RTU.)

**REGION 6**





**Interpretation IC 170-2021-X of  
ANSI/ASHRAE/ASHE Standard 170-2021  
Ventilation of Health Care Facilities**

Date Approved:

**Request from:** Rory Creegan ([Creeganr@jbb.com](mailto:Creeganr@jbb.com)), Jaros, Baum, & Bolles Engineers, 80 Pine Street, New York, NY 10005. (Phone: 212-530-9300)

**Reference:** This request for interpretation refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2021, Section 6.7.2 and Table 6-2, regarding supply air outlets

**Background:** ASHRAE/ASHE Standards 170, Table 6-2 Supply Air Outlets, states requirements for different spaces covered by the standard categorized by Groups.

ASHRAE Fundamentals 2017, Chapter 20 defines supply air outlet types and characteristics as below:

- Group A1: Outlets mounted in or near the ceiling that discharge air horizontally.
- Group A2: Outlets discharging horizontally that are not influenced by an adjacent surface.
- Group B: Outlets mounted in or near the floor that discharge air vertically in a linear jet.
- Group C: Outlets mounted in or near the floor that discharge air vertically in a spreading jet.
- Group D: Outlets mounted in or near the floor that discharge air horizontally. When used in fully stratified systems, these outlets use low discharge velocity; in mixed systems, they use higher discharge velocity.
- Group E: Outlets that project supply air vertically downward.

**Interpretation:** In-room HVAC units with no ductwork downstream of a coil (i.e. induction units, fan coils) do not have a supply air outlet as defined by ASHRAE Fundamentals 2017, Chapter 20. Therefore, ASHRAE/ASHE Standards 170, Table 6-2 Supply Air Outlets does not apply to these devices and Table 6-2 is not intended to limit the use of these devices based on the airflow pattern.

**Question:** Is this interpretation correct?

**Answer:**

**Comments:**

**Interpretation IC 170-2021-X of  
ANSI/ASHRAE/ASHE Standard 170-2021  
Ventilation of Health Care Facilities**

Date Approved:

**Request from:** Dan Nesman ([dnesman@icthomasson.com](mailto:dnesman@icthomasson.com)), I.C. Thomasson Associates, 3031 N. Rocky Point Drive W., Suite 750, Tampa, FL 33607. (Phone: 813-882-4415)

**Reference:** This request for interpretation refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2021, Section 6.3.1.1 and Table 6-1, regarding Air Intake Separation Distance – gas-fired RTU.

**Background:** According to ASHRAE/ASHE 170 Section 6.3.1.1 there is an exception to Table 6-1 for gas-fired, packaged rooftop units allowing for the separation distance to be less than 25ft and refers to Table 5-1 in ASHRAE Standard 62.1-2019. Table 5-1 indicates that vents, chimneys, and flues from combustion appliances and equipment may have a minimum separation distance of 15 ft. However, Table 5-1 also indicates the minimum distance for Class 4 air to be 30 ft. *Class 4: Air with highly objectionable fumes or gases or with potentially dangerous particles, bioaerosols, or gases, at concentrations high enough to be considered as harmful.* 2019 ASHRAE 62.1 Section 5.5.1b allows for the calculation methods in Normative Appendix B. Note that this calculation has been significantly altered in Addendum ag to 2022 ASHRAE 62.1. Also, 2019 ASHRAE 62.1 Section 5.5.1.2 indicates that minimum distances for fuel-fire appliances shall be as required by NFPA 54. 2018 NFPA 54 8.3.1.3 indicates that outdoor discharge of purged gases must be 25 ft from mechanical air intake openings.

**Interpretation:** Since the explicit intent of the exception to ASHRAE/ASHE 170 Section 6.3.1.1 is to allow for the separation distance to be less than 25 ft and the specific reference is only Table 5-1 in ASHRAE 62.1-2019, the separation distance of 15 ft is acceptable for gas-fired, packaged rooftop units at hospitals and outpatient facilities.

**Question:** Is this interpretation correct?

**Answer:**

**Comments:**

# CURRENT ASHRAE 170 GROWTH

Interpretation IC 170-2021-X of  
ANSI/ASHRAE/ASHE Standard 170-2021  
Ventilation of Health Care Facilities

Date Approved:

**Request from:** Heather Platt Gulledge ([hplatt@dewberry.com](mailto:hplatt@dewberry.com)), Dewberry, 2610 Wycliff Road., Suite 410, Raleigh, NC 27607. (Phone: 919.242.3727)

**Reference:** This request for interpretation refers to the requirements in ANSI/ASHRAE/ASHE Standard 170-2017, Section 3, regarding definition alignment with FGI Guidelines.

**Background:** Section 5.2a requires the owner/manager of health care facilities to prepare a space program which includes the clinical service expected in each space and include space names and paragraph numbering references from the applicable version of the relevant FGI Guidelines for each space noted in the program.

The definition for Class 2 imaging room states “diagnostic and therapeutic procedures such as coronary, neurological, or peripheral angiography, including electrophysiology, cardiac catheterization and interventional angiography and similar procedures.”

The definition for Class 3 imaging room states “invasive procedures including cardiac stenting, implantation of devices in an invasive fluoroscopy, and any other Class 2 procedure during which the patient will require physiological monitoring and is anticipated to require active life support.”

The procedure examples used in these two definitions have been performed in both Class 2 and Class 3 rooms, specifically the cardiac stenting and invasive fluoroscopy. The appropriate imaging environment for any procedure is determined by each healthcare organization through their documented risk assessment program which considers many factors including but not limited to the type of case, type of patient, level of invasiveness, and anticipated future flexibility/need.

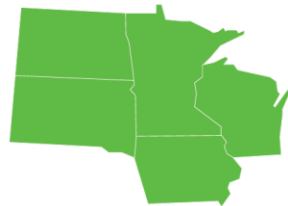
**Interpretation:** Cardiac stenting and invasive fluoroscopy can be performed in both Class 2 and Class 3 type imaging rooms as determined by the healthcare organization space program required by Section 5.2a.

**Question:** Is this interpretation correct?

**Answer:** Yes

**Comments:** The designer designs the space based on the level of cleanliness (class 1, class 2, class 3) the owner requests in the building program. The owner determines what procedures are appropriate within the designed space, not the designer.

REGION 6





# AGENDA

1. What even IS ASHRAE 170?
2. How does 170 work?
3. Current 170-2021 growth
4. **Maturing to 170-2025**

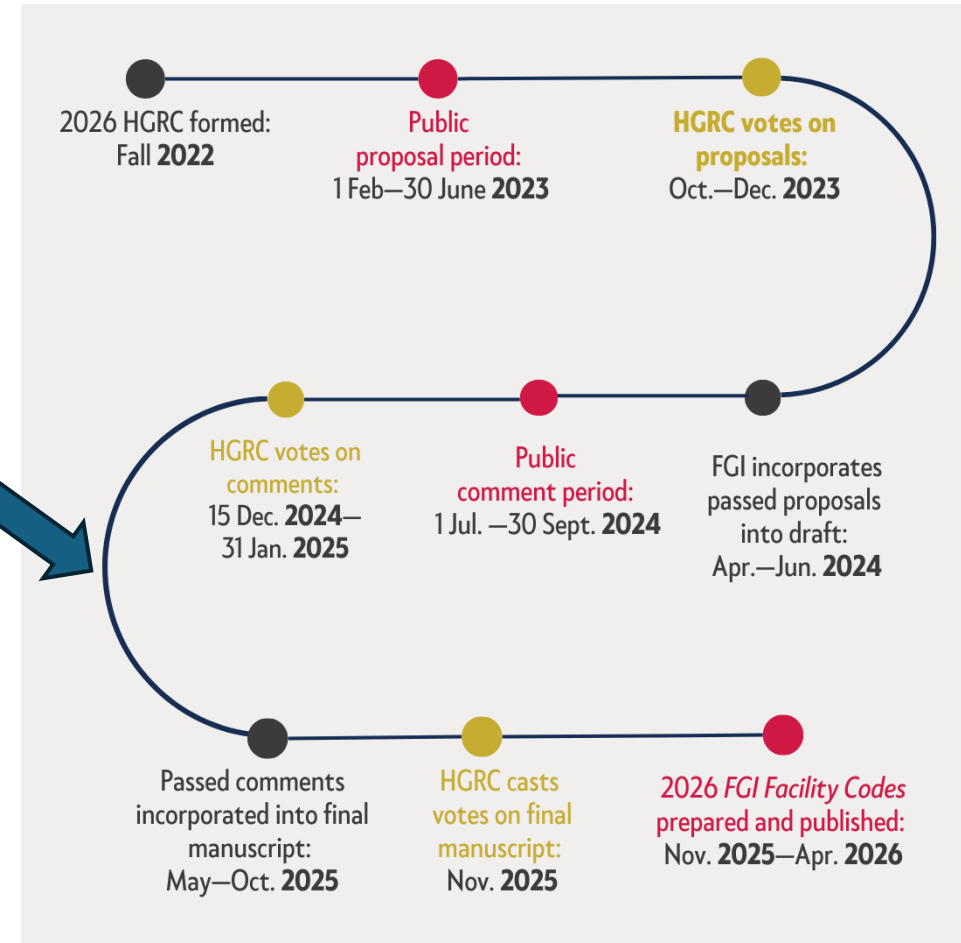




# MATURING TO ASHRAE 170-2025

ASHRAE 170-2025 =  
ASHRAE 170-2021 + addenda

Publish ~March 2025 for  
inclusion in 2026 *FGI Facility  
Codes*





# QUESTIONS AND (MAYBE) ANSWERS

