

# ANSI/ASHRAE/ASHE 170 Updates

**STANDARD**

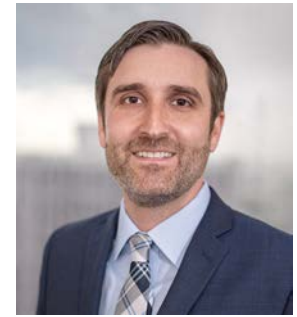
**ANSI/ASHRAE/ASHE Standard 170-2021**  
(Supersedes ANSI/ASHRAE/ASHE Standard 170-2017)  
Includes ANSI/ASHRAE/ASHE addenda listed in Appendix F

**Ventilation of  
Health Care Facilities**



**Michael Sheerin, PE, LEED AP**  
Chair and Chief Executive Officer  
[Michael.Sheerin@tlc-eng.com](mailto:Michael.Sheerin@tlc-eng.com)

Past Chair – ANSI/ASHRAE/ASHE Standard 170  
*Ventilation of Health Care Facilities*  
Past Chair – ANSI/ASHRAE/ASHE Standard 189.3  
*Design, Construction & Operation of Sustainable, High  
Performance Health Care Facilities*



**Aaron Johnson, PE, LEED AP BC+C**  
Director of Healthcare Operations  
[aaron.johnson@tlc-eng.com](mailto:aaron.johnson@tlc-eng.com)

Voting Member and Secretary–  
ANSI/ASHRAE/ASHE Standard 170  
*Ventilation of Health Care Facilities*



**39th Annual FPC Seminar + Expo**

# Course Description

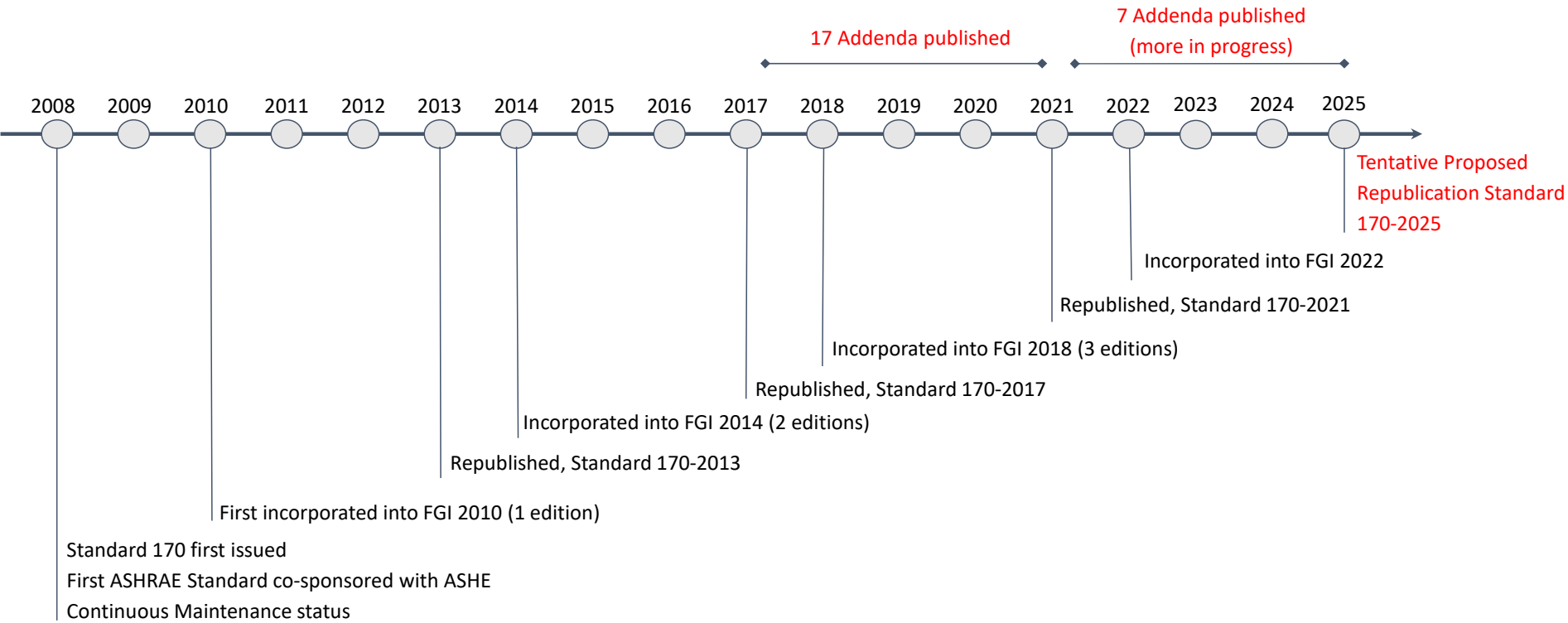
With ASHRAE 170 as a Continuous Maintenance Document, addenda are frequently published, although not mandated by the state's adoption process. Members of the ASHRAE 170 committee will provide an overview of changes that have been incorporated into the 2021 published edition as incorporated by the FGI Guidelines along with more recent updates that have been approved or are presently in the works. Additionally, a preview will be provided of the newly drafted operational guideline for healthcare facilities.

# Course Learning Objectives

After participating in this seminar session, attendees will be able to:

- Define key addenda that have changed ASHRAE/ASHE Standard 170 and the key differences between the 2017 (FBC 2020) and 2021 (FBC 2023) editions.
- Recognize the direct impact of the revisions on the upcoming code cycle update
- Understand how the new Standard 170-2021 corresponds with recently published FGI 2022 Guidelines

# History



# Reminder

All projects currently being submitted to AHCA must comply with ASHRAE 170-2017 via FGI 2018 and FBC 2020

Current Applicable Rules, Codes and Standards for AHCA projects can be found here:

[Applicable Codes and Standards.pdf](#)

([myflorida.com](http://myflorida.com))

OR

[https://ahca.myflorida.com/content/download/5196/file/Applicable Codes and Standards.pdf](https://ahca.myflorida.com/content/download/5196/file/Applicable_Codes_and_Standards.pdf)

**Florida Building Codes** To obtain these codes you may see them or order them from The Department of Business and Professional Regulation – Florida Building Commission at the web site: [https://www.floridabuilding.org/bc/bc\\_default.aspx](https://www.floridabuilding.org/bc/bc_default.aspx)

Effective December 31st, 2020, the following building codes are adopted by The Florida Building Code Commission by promulgation of Rule 61G20-1.001. These are the only building codes to be used for all projects that have not received a Stage II Preliminary Plan or a Stage III Construction Document Plan approval prior to December 31st, 2020:

- Florida Building Code 7th Edition (2020) - Building
- Florida Building Code 7th Edition (2020) - Accessibility
- Florida Building Code 7th Edition (2020) - Test Protocols
- Florida Building Code 7th Edition (2020) - Mechanical
- Florida Building Code 7th Edition (2020) - Plumbing
- Florida Building Code 7th Edition (2020) - Fuel Gas

**Additional Standards:** Additional design requirements are incorporated by reference in the special occupancy chapters of the Florida Building Code to include the following:

- Guidelines for the Design and Construction of Hospitals, 2018 Edition.
- Guidelines for the Design and Construction of Outpatient Facilities, 2018 Edition.
- Guidelines for the Design and Construction of Residential Health, Care and Support Facilities (First Printing 2018), 2018 Edition.

# Florida Building Codes and Effective Dates

## Reminder

FBC 2020 will be effective on new project submissions for just more than one more year until FBC 2023 takes effect (**Tentative: December 31, 2023**)

FBC 2023 will reference FGI 2022 and ASHRAE 170-2021

Code Edition	2001 FBC	2004 FBC	2007 FBC	2010 FBC	5th Edition (2014)	6th Edition (2017)	Current Version 7th Edition (2020)	8th Edition (2023)
	Original 2003 Supplement	Original 2005 Supplement 2006 Supplement 2007 Supplement	Original 1 <sup>st</sup> 2009 Supplement 2 <sup>nd</sup> 2009 Supplement	Original 2012 Supplement	Original Supplement 1 Supplement 2			
Effective Date	March 1, 2002 June 30, 2003	Oct 1, 2005 Dec 16, 2005 Dec 8, 2006 July 1, 2007	March 1, 2009 March 1, 2009 Oct 1, 2009	March 15, 2012 April 15, 2012	June 30, 2015 July 1, 2016 October 8, 2016	December 31, 2017	December 31, 2020	Tentative Date of December 31, 2023



Image Reference:

[https://www.floridabuilding.org/fbc/Publications/2023\\_Effective\\_Dates.pdf](https://www.floridabuilding.org/fbc/Publications/2023_Effective_Dates.pdf)

# 39th Annual FPC Seminar + Expo

# FGI 2018 & Standard 170-2017

FGI is revised & published every 4 years.

In between editions the following are published:

- Errata
- Interpretations

**Standard 170** is a Continuous Maintenance Document.

- Approved Addenda become part of the standard

“ASHRAE keeps Standard 170 under a continuous maintenance process, which permits official changes to be made at any point over the life cycle of the document. It is the intention of FGI that addenda to 170 issued by ASHRAE after publication of the 2017 edition shall be considered part of the 2018 *Guidelines* documents.”

Excerpt from 2018 FGI



# FGI 2018 & Standard 170-2017

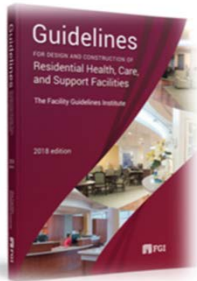
FGI 2018 is in three books:

- Hospital
- Outpatient
- Residential

Standard 170 is included in its entirety in each book.

Standard 170 mirrors the books with our Chapters 7-9

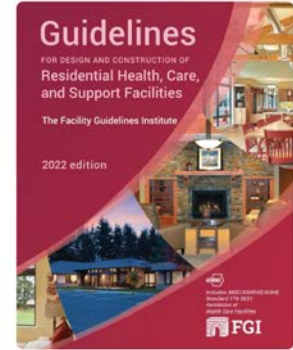
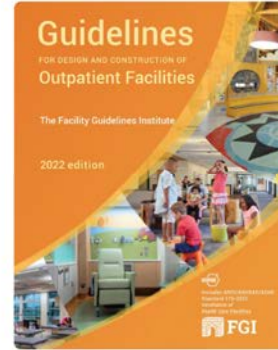
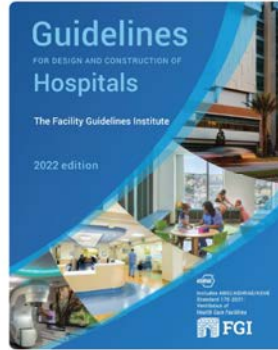
- Chapter 7 Inpatient
- Chapter 8 Outpatient
- Chapter 9 Residential



# FGI 2022 & Standard 170-2021

FGI 2022 remains in three books:


- Hospital
- Outpatient
- Residential



**FGI 2022 includes Standard 170-2021 in its entirety including addenda c and d**

# ASHRAE Standard 170-2021

## ANSI/ASHRAE/ASHE Standard 170-2017, Ventilation of Health Care Facilities

**NOTE:** All documents linked from this page are in  PDF-format.

 [ANSI/ASHRAE/ASHE Addendum a for Standard 170-2017 \(September 2, 2020\)](#)

 [ANSI/ASHRAE/ASHE Addendum b for Standard 170-2017 \(March 2, 2020\)](#)

 [ANSI/ASHRAE/ASHE Addendum c for Standard 170-2017 \(March 2, 2020\)](#)

 [ANSI/ASHRAE/ASHE Addendum g for Standard 170-2017 \(January 2, 2020\)](#)

 [ANSI/ASHRAE/ASHE Addendum h for Standard 170-2017 \(January 2, 2020\)](#)

 [ANSI/ASHRAE/ASHE Addendum i for Standard 170-2017 \(March 2, 2020\)](#)

 [ANSI/ASHRAE/ASHE Addendum j for Standard 170-2017 \(August 3, 2020\)](#)

 [ANSI/ASHRAE/ASHE Addendum k for Standard 170-2017 \(August 3, 2020\)](#)

 [ANSI/ASHRAE/ASHE Addendum l for Standard 170-2017 \(March 3, 2020\)](#)

 [ANSI/ASHRAE/ASHE Addendum m for Standard 170-2017 \(March 2, 2020\)](#)

 [ANSI/ASHRAE/ASHE Addendum n for Standard 170-2017 \(March 2, 2020\)](#)

 [ANSI/ASHRAE/ASHE Addendum o for Standard 170-2017 \(December 13, 2019\)](#)

 [ANSI/ASHRAE/ASHE Addendum p for Standard 170-2017 \(December 13, 2019\)](#)

 [ANSI/ASHRAE/ASHE Addendum q for Standard 170-2017 \(December 13, 2019\)](#)

 [ANSI/ASHRAE/ASHE Addendum r for Standard 170-2017 \(December 13, 2019\)](#)

 [ANSI/ASHRAE/ASHE Addendum s for Standard 170-2017 \(December 13, 2019\)](#)

For 170-2017 Addenda, go to:

<https://www.ashrae.org/technical-resources/standards-and-guidelines/standards-addenda/ansi-ashrae-ashe-standard-170-2017-ventilation-of-health-care-facilities>

For 170-2021 Addenda, go to:

<https://www.ashrae.org/technical-resources/standards-and-guidelines/standards-addenda>

## ANSI/ASHRAE/ASHE Standard 170-2021, Ventilation of Health Care Facilities

 [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 \(September 30, 2022\)](#)

 [Addendum g to Standard 170-2021 \(September 30, 2022\)](#)

 [Addendum h to Standard 170-2021 \(September 30, 2022\)](#)

 [Addendum j to Standard 170-2021 \(July 31, 2023\)](#)

2021 edition includes Addenda a, b, c, d, e, g, h, i, j, k, l, m, n, p, q, r and s

2021 edition has issued Addenda c, d, e, f, g, h and j

**Why is ASHRAE 170-2017 Addenda Important to know if FBC 2023 will enforce ASHRAE 170-2021?**

**170-2017 Addenda Highlight the Changes incorporated into 170-2021**

# AHCA Acceptance of Addenda

Typically, Addenda must be more stringent than code to be accepted

Approval to utilize addenda must be obtained on a per project basis

Recommend document during prelim stages:

- Stage 1/Stage 2 or Stand Up or
- Prior to if possible

**ACCEPTED!**

**DENIED!**

# 2017-Addendum i

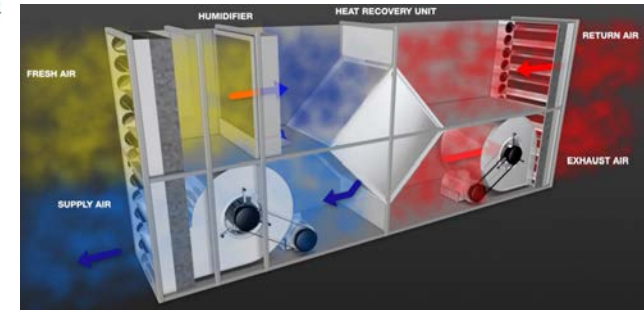
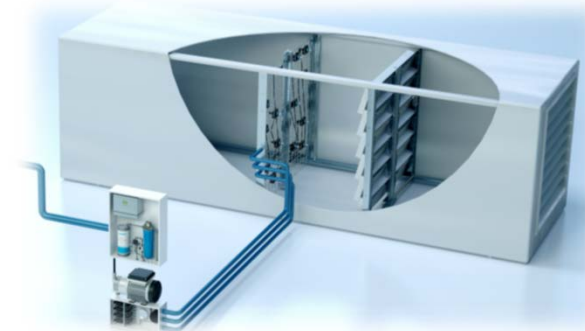
# Adiabatic Humidifiers

Expanding the standard for user familiarity and guidance for usage of Adiabatic Humidifiers for reduced energy consumption vs. Isothermal

- Water Temperature re Legionella risk
- Water Purity level when discharged to space

## 6.6.3 Adiabatic Atomizing Humidifier Requirements

- Humidifier water shall be treated with a reverse osmosis process, a UV-C sterilization light source, and a submicron filter. **Informative Note:** For more information, see ASTM (2011) in Appendix B.
- Treated humidifier water shall be continuously circulated from the source to the humidifier valves. All valves, headers, and piping not part of the recirculation loop shall drain completely when not in use. Water temperature shall be maintained within the control limits in the legionellosis risk management plan. (**Informative Note:** For more information, refer-ence ASHRAE Guideline 12 and ASHRAE Standard 188.)
- Ports suitable for testing water quality shall be provided in the treated humidifier water pip-ing system.
- Moisture eliminators shall be provided as required to prevent moisture accumulation in ductwork.
- Water purity shall meet or exceed potable water standards at the point where it enters the ventilation system, space, or water-vapor generator.




# 2017-Addendum k

# Residential

## Coordinating with FGI Residential

- 170 Chapter 9 table – spaces align with FGI Residential volume
- Resolve applicability for specific types (Nursing, Hospice)

Table 9.1 Design Parameters for Residential Health, Care, and Support-Specific Spaces



Function of Space	Pressure Relationship to Adjacent Areas (b)(1)	Minimum Outdoor ach	Minimum Total ach	All Room Air Exhausted Directly to Outdoors (b)(1)	Air Recirculated by Means of Room Units (a)	Unoccupied Turndown	Minimum Filter Efficiencies (b)(1)	Design Relative Humidity (b)(1)	Design Temperature (b)(1), °F/°C
<b>RESIDENTIAL HEALTH</b>									
<b>NURSING HOMES</b>									
All room (b)	Negative	2	12	Yes	No	Yes	13/NR	Max 60	70-75/21-24
All anteroom (b)	(b) Negative	NR	10	Yes	No	Yes	13/NR	NR-Max 60	NR-70-78/21-29
Occupational therapy	NR	2	6	NR	NR	Yes	13/NR	NR	70-75/21-24
Physical therapy	Negative	2	6	NR	NR	Yes	13/NR	NR	70-75/21-24
Resident gathering/living/activity/dining	NR	4	4	NR	NR	Yes	13/NR	NR-Max 60	70-75/21-24
Resident room	NR	2	2	NR	NR	Yes	13/NR	NR-Max 60	70-75/21-24
Resident unit-corridor	NR	NR	4	NR	NR	Yes	13/NR	NR	NR-70-78/21-29
Toilet/bathing room	Negative	NR	10	Yes	No	No	13/NR	NR	70-75/21-24
<b>HOSPICE FACILITIES</b>									
All room (c)	Negative	2	12	Yes	No	Yes	13/NR	Max 60	70-75/21-24
All anteroom (c)	(c)	NR	10	Yes	No	Yes	13/NR	NR-Max 60	NR
Resident room	NR	2	2	NR	NR	Yes	13/NR	NR-Max 60	70-75/21-24
Resident unit-corridor	NR	NR	4	NR	NR	Yes	13/NR	NR	NR
Toilet/bathing room	Negative	NR	10	Yes	No	Yes	13/NR	NR	70-75/21-24

# 2017-Addendum m

# Behavioral Health

General clean up and references updates

**7.6 Behavioral and Mental Health Psychiatric Patient Areas.** HVAC systems and related controls shall be secured as called for in the patient safety risk assessment. All exposed equipment located with these spaces shall have enclosures with rounded corners and tamper-resis-

Table 7.1 Design Parameters—Inpatient 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
<b>NURSING UNITS AND OTHER PATIENT CARE AREAS</b>									
[...]									
<b>BEHAVIORAL AND MENTAL HEALTH FACILITIES (k)</b>									
Patient bedroom, resident room (2.5-2.2.2)	NR	2	2	NR	NR	Yes	8/NR	NR	NR
Seclusion room (2.5-2.24.3)	NR	4	2	NR	NR	Yes	8/NR	NR	NR



# 2017-Addendum p Filtration & Unoccupied Turndown

- Addition of new columns in the Tables!



# 2017-Addendum p Filtration & Unoccupied Turndown

TABLE 7.1 Design Parameters – Hospital Spaces-Inpatient Spaces

Function of Space (dd)	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 (bb)
<b>SURGERY AND CRITICAL CARE</b>							
<b>NURSING UNITS AND OTHER PATIENT CARE AREAS</b>							
Operating room (2.2-3.3.2) (m), (o)	Positive	4	20	NR	No	Yes	8/14
Operating/surgical cystoscopic rooms, (m), (o)	Positive	4	20	NR	No	Yes	8/14
Cesarean Delivery room (Caesarean) (2.2-2.11.9) (m), (o)	Positive	4	20	NR	No	Yes	8/14
<del>Substerile service area- Sterile processing room (2.2-3.3.6.13)</del>	NR	2	6	NR	No	Yes	8/14
Recovery room-Phase I PACU and Phase II recovery (2.2-3.3.4.3 & 2.2-3.3.4.4)	NR	2	6	NR	No	Yes	8/14
<del>Critical and intensive care-Critical care patient care station (2.2-2.6.2)</del>	NR	2	6	NR	No	Yes	8/14
Intermediate care patient room (2.2-2.5.2) (s)	NR	2	6	NR	NR	Yes	8/14
Wound intensive care (burn unit)	NR	2	6	NR	No	Yes	8/14
Newborn Neonatal intensive care (2.2-2.10.2)	Positive	2	6	NR	No	Yes	8/14
Treatment room (p)	NR	2	6	NR	NR	Yes	8/14
Emergency department Trauma/resuscitation room (crisis or shock) (2.2-3.1.3.3(6)) (c)	Positive	3	15	NR	No	Yes	8/14
Medical/anesthesia gas storage (r) (2.2-3.3.6.11 (3))	Negative	NR	8	Yes	NR	No	8/NR
Laser eye room	Positive	3	15	NR	No	Yes	8/14
Emergency Department public waiting area (2.2-3.1.3.4)	Negative	2	12	Yes (q)	NR	No	8/14
Emergency service Triage area (2.2-3.1.3.3)	Negative	2	12	Yes (q)	NR	No	8/14
ER Emergency department human decontamination (2.2-3.1.3.6 (8))	Negative	2	12	Yes	No	No	8/14
Radiology waiting rooms	Negative	2	12	Yes (q), (w)	NR	No	8/14
Procedure room (3.7-3.2) (o), (d)	Positive	3	15	NR	No	Yes	13/NR
Emergency department exam/treatment room (2.2-3.1.3.6)(p)	NR	2	6	NR	NR	No	8/14
<b>INPATIENT-NURSING</b>							
Patient room (2.1-2.2)	NR	2	4(y)	NR	NR	Yes	8/14
Seclusion room (2.1-2.4.3)	NR	2	4 (y)	NR	NR	Yes	8/NR
Nourishment area or room (2.1-2.6.7)	NR	NR	2	NR	NR	Yes	8/14
Patient Toilet room (2.1-2.2.6)	Negative	NR	10	Yes	No	No	8/NR
Newborn nursery suite (2.2-2.12.3.1)	NR	2	6	NR	No	Yes	8/14
Continued care nursery (2.2-2.12.3.3)	NR	2	6	NR	No	Yes	8/14

# 2017-Addendum s Airborne Infection Isolation Room

Topic – Improve adaptability for pandemic needs

Allow HEPA discharge from A.I.I. room to general exhaust

e.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 without mixing with exhaust air from any other non-AII room or general exhaust system.
2. Discharged into the general exhaust stream, provided the AII 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 interlocked with the general exhaust system fan. Alarms for filter loading and fan failure should be considered.)

# 2017-Addendum I

# OR & Imaging Definitions

Coordinating with FGI - Extensive revisions to Definitions

- Redefine Invasive Procedure
- Define Hybrid Operating Room
- Define Class 1 / Class 2 / Class 3 Imaging

# 2017-Addendum I

# Invasive

## Invasive Procedure definitions

*invasive procedure*\*: a procedure that is performed in an aseptic surgical field and penetrates the protective surfaces of a patient's body (e.g., subcutaneous tissue, mucous membranes, cornea). An invasive procedure may fall into one or more of the following categories:

- a. penetrates the protective surfaces of a patient's body (e.g., skin, mucous membranes, cornea);
- b. is performed in an aseptic surgical field (i.e., a procedure site);  
a.e. generally requires Requires entry into, or opening of, a sterile body cavity; and (i.e., cranium, chest, abdomen, pelvis, joint spaces)
- b.d. may involve Involves insertion of an indwelling foreign body
- c. Includes excision and grafting of burns that cover more than 20% of total body area
- d. Does not begin as an open procedure but has a recognized measurable risk of requiring conversion to an open procedure

*invasive imaging procedure room*: a room in which radio-graphic imaging is used and in which instruments or devices are inserted into patients through the skin or body orifice under sterile conditions for diagnosis and/or treatment.

[ . . . ]

*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 refer to *Class 3 imaging room* for cardiac stenting or implantation of devices.)

# 2017-Addendum I

# Anesthetic Gas Use

## Requirements when using inhalation or anesthetic gases

### *De-linked space from Anesthetic gas use !*

7. Unless a higher ventilation rate is stipulated in Table 7.1 or elsewhere in this standard, wherever anesthetic gases are administered outside of an operating room, procedure room, or Class 2 and Class 3 imaging rooms, ventilation shall be provided at a mini-mum rate of 2 outdoor ach and 6 total ach. (*Informative Notes:* [1] Refer to NFPA 99 for WAGD piping and gas scavenging requirements. [2] “Anesthetic gases” commonly refers to nitrous oxide and xenon but may also include halogenated volatile anesthetic agents such as desflurane, sevoflurane, and isoflurane.)

~~**Delete Section 7.4.3 as shown.**~~

~~**7.4.3 Imaging Procedure Rooms.** If invasive procedures occur in this type of room, ventilation shall be provided in accordance with the ventilation requirements for procedure rooms. If anesthetic gases are administered, ventilation shall be provided in accordance with the ventilation requirements for operating rooms.~~

# 2017-Addendum I

# Operating Room Definitions

## Operating Room definitions

~~**Operating room (OR)\*:** a room in the surgical suite that meets the requirements of a restricted area and is designated and equipped for performing surgical or other invasive procedures. An aseptic field is required for all procedures performed in an OR. Any form of anesthesia may be administered in an OR if proper anesthesia gas administration devices are present and waste anesthesia gas disposal systems are provided.~~

**operating room (OR):** a room in the surgical suite that meets the requirements of a restricted area and is designated and equipped for performing invasive procedures. (*Informative Note:* Definition is adapted from the FGI Guidelines; see FGI [2018a, 2018b] in Informative Appendix E.)

**Hybrid operating room:** A room that meets the definition of an operating room and has permanently installed equipment to enable diagnostic imaging before, during and after surgical procedures. Note: Imaging equipment may include, MRI, fixed single-plane and bi-plane tomographic imaging systems, and computed tomography equipment. Use of portable imaging technology does not make an OR a hybrid operating room.

# 2017-Addendum I

# Operating Room Filtration

## HEPA Diffuser Location

**7.4.1 Operating Rooms, Operating/Surgical Cystoscopic Rooms, and Caesarean Delivery Rooms, and Class 3 Imaging Rooms.** These 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. ~~we~~ of water (2.5 Pa). Each room shall have individual temperature control. These rooms shall be provided with a primary supply diffuser array that is designed as follows:

[ ... ]

c. In operating rooms or Class 3 imaging rooms designated for orthopedic procedures, transplants, neurosurgery, or dedicated burn unit procedures, HEPA filters shall be provided and located in the air terminal device.

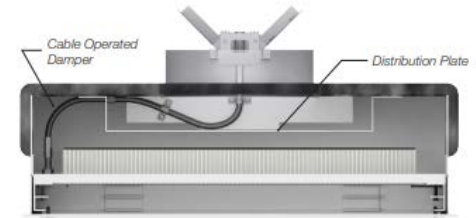


Image Source: Price Industries



# 2017-Addendum I Imaging Room Classification

## Class 1 / Class 2 / Class 3 Imaging definitions

**Class 1 imaging room:** 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:** 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:** 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.

Table 7.1 Design Parameters—Inpatient Spaces

Function of Space (ce)	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
[...]									
DIAGNOSTIC AND TREATMENT									
[...]									
Imaging (diagnostic and treatment) Class 1 imaging room (FGI 2.2-3.4.2.4[1][b][ii])	NR (xx)	2	6	NR	NR	Yes	8/14	Max 60	72-78/22-26
Interventional and intraoperative MRI procedure room (2.2-3.5.2)	Positive	3	45	NR	No	Yes	8/14	Max 60	70-75/21-24
Interventional imaging procedure room (2.2-3.5.2) Class 2 imaging room (d), (p) (FGI 2.2.3.4.2.4[1][b][iii])	Positive	3	15	NR	No	Yes	8/14	Max 60	70-75/21-24
Class 3 imaging room (m), (o) (FGI 2.2.3.4.2.4[1][b][iii])	Positive	4	20	NR	No	Yes	16 (xx)	20-60	68-75/21-24
Nuclear medicine treatment procedure room (2.2-3.6.1)	Negative	2	6	Yes	NR	Yes	8/14	NR	70-75/21-24

# 2017-Addendum I Imaging Room Classification

## Class 1 / Class 2 / Class 3 Imaging definitions

---

*Normative Notes for Table 7.1:*

[...]

l. Systems shall be capable of maintaining the rooms within the range during normal operation. Lower or higher temperature shall be permitted when patients' occupants' comfort and/or medical conditions require those conditions.

[...]

xx. See Section 7.4.1(c).

yy. Negative pressure is required if open mixing of isotopes or gaseous studies are performed as a part of nuclear treatment procedures within the imaging room. (Informative Note: Open mixing of isotopes is typically performed in the hot lab.)

**Class 1 imaging room:** 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:** 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:** 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.

# 2017 Addendum I

# Imaging Rooms - *Interpretation*

**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. The HVAC classification of the room based on Standard 170 does not determine the usage of the room.

**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.

# 2021-Addendum d

# Imaging Rooms - *Redefined*

- Class 3 imaging updated to remove “Cardiac Stenting and implantation of devices in an invasive fluoroscopy”

## 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.)

# 2021-Addendum c

# Filtration Requirements

Table 9-1 Design Parameters for Residential Health, Care, and Support-Specific Spaces

Function of Space (f)	Pressure Relationship to Adjacent Areas (d)	Minimum Outdoor ach	Minimum Total ach	All Room Air Exhausted Directly to Outdoors (f)	Air Recirculated by Means of Room Units (a)	Unoccupied Turndown	Minimum Filter Efficiencies (i)	Design Relative Humidity (g), %	Design Temperature (h), °F/°C
<b>RESIDENTIAL HEALTH</b>									
<b>NURSING HOMES</b>									
All room (FGI 3.1-2.2.4.1) (b)	Negative	2	12	Yes	No	Yes	MERV- <del>14</del> <sup>11</sup>	Max 60	70-78/21-29
All anteroom (FGI 3.1-2.2.4.1) (b)	Negative	NR	10	Yes	No	Yes	MERV- <del>14</del> <sup>11</sup>	Max 60	70-78/21-29
Occupational therapy (FGI 3.1-3.3.3)	NR	2	6	NR	NR	Yes	MERV- <del>14</del> <sup>11</sup>	NR	70-78/21-29
Physical therapy (FGI 3.1-3.3.2)	Negative	2	6	NR	NR	Yes	MERV- <del>14</del> <sup>11</sup>	NR	70-78/21-29
Resident living/activity/dining (FGI 3.1-2.3.3)	NR	4	4	NR	NR	Yes	MERV- <del>14</del> <sup>11</sup>	Max 60	70-78/21-29
Resident room (FGI 3.1-2.2.2)	NR	2	2	NR	NR	Yes	MERV- <del>14</del> <sup>11</sup>	Max 60	70-78/21-29
Resident corridor (FGI 2.4-2.2.2)	NR	NR	4	NR	NR	Yes	MERV- <del>14</del> <sup>11</sup>	NR	70-78/21-29
Toilet/bathing room (FGI 3.1-2.2.2.6)	Negative	NR	10	Yes	No	No	MERV- <del>14</del> <sup>11</sup>	NR	70-78/21-29
<b>HOSPICE FACILITIES</b>									
All room (FGI 3.2-2.2.3.1) (c)	Negative	2	12	Yes	No	Yes	MERV- <del>14</del> <sup>11</sup>	Max 60	70-75/21-24
All anteroom (FGI 3.2-2.2.3.1) (c)	(e) NR	NR	10	Yes	No	Yes	MERV- <del>14</del> <sup>11</sup>	Max 60	NR
Resident room (FGI 3.2-2.2.2)	NR	2	2	NR	NR	Yes	MERV- <del>14</del> <sup>11</sup>	Max 60	70-75/21-24
Resident corridor (FGI 2.4-2.2.2)	NR	NR	4	NR	NR	Yes	MERV- <del>14</del> <sup>11</sup>	NR	NR
Toilet/bathing room (FGI 3.2-2.2.2.6)	Negative	NR	10	Yes	No	Yes	MERV- <del>14</del> <sup>11</sup>	NR	70-75/21-24
<b>RESIDENTIAL CARE AND SUPPORT</b>									
<b>ASSISTED LIVING FACILITIES</b>									
Resident living/activity/dining (FGI 4.1-2.3.3)	NR	NR	NR	NR	NR	Yes	MERV-8	NR	NR
Resident room (FGI 4.1-2.2.2)	NR	NR	NR	NR	NR	Yes	MERV-8	NR	70-78/21-29
Resident corridor (FGI 2.4-2.2.2)	NR	NR	NR	NR	NR	Yes	MERV-8	NR	NR
Toilet/bathing room (FGI 4.1-2.2.2.7)	NR	NR	NR	NR	NR	Yes	MERV-8	NR	NR
<b>SERVICE</b>									
Clean linen storage (FGI 2.3-4.6)	Positive	NR	2	NR	NR	No	MERV-8	NR	72-78/22-26
Dietary storage (FGI 2.3-4.5)	NR	NR	2	NR	No	No	MERV-8	NR	72-78/22-26
Food preparation center (FGI 2.3-4.5.3.3) (e)	NR	2	10	NR	No	Yes	MERV-8	NR	72-78/22-26
Hair salon (FGI 2.3-2.3.5 & 4.1-2.3.5)	Negative	NR	10	Yes	NR	Yes	MERV-8	NR	70-78/21-29
Laundry, central and personal (FGI 2.3-4.2.7)	Negative	2	10	Yes	No	No	MERV-8	NR	NR
Linen and trash chute room (FGI 2.3-4.6 & 2.3-4.9)	Negative	NR	10	Yes	No	No	MERV-8	NR	NR
Medication room (FGI 2.3-4.2.2.2)	NR	2	4	NR	NR	Yes	MERV-8	Max 60	70-75/21-24
Soiled linen sorting and storage (FGI 2.3-4.6)	Negative	NR	10	Yes	No	No	MERV-8	NR	NR
Warewashing (FGI 2.3-4.5.3.6)	Negative	NR	10	Yes	No	Yes	MERV-8	NR	NR
<b>SUPPORT SPACE</b>									
Clean utility (FGI 2.3-4.2.5)	Positive	2	4	NR	NR	No	MERV-8 (k)	NR	NR
Environmental services room (FGI 2.3-4.9) (j)	Negative	NR	10	Yes	NR	No	MERV-8	NR	NR
Hazardous waste storage (FGI 2.3-4.8)	Negative	2	10	Yes	No	No	MERV-8	NR	NR
<u>Nonrefrigerated body holding room</u>	<u>Negative</u>	<u>NR</u>	<u>10</u>	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>MERV-8</u>	<u>NR</u>	<u>68-75/20-24</u>
Soiled utility or soiled holding (FGI 2.3-4.2.6)	Negative	2	10	Yes	No	No	MERV-8	NR	NR

Informative Note: NR = No requirement

**Nursing Home  
Filtration Level  
Decreased**

**Hospice Facilities  
Filtration Level  
Increased**

# 2021-Addendum f (July 5<sup>th</sup>, 2022)

## Addendum f to Standard 170-2021

### Revise Section 7.1(a)(6) as shown.

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

- a. Spaces shall be ventilated according to Table 7-1. [...]
6. For air-handling systems serving multiple spaces, system minimum outdoor air quantity shall be calculated using one of the following methods:

i. For systems serving only spaces within the scope of this standard, system minimum outdoor air quantity for an air-handling system shall be calculated as the sum of the individual space requirements as defined by this standard.

ii. System minimum outdoor air quantity shall be calculated by the Ventilation Rate Procedure (multiple zone formula) of ASHRAE Standard 62.1<sup>1</sup>. The minimum outdoor air change rate listed in this standard shall be interpreted as the zone outdoor airflow ( $V_{oz}$ ) for purposes of this calculation.

iii. For systems serving spaces both in this standard and in ASHRAE Standard 62.1, system minimum outdoor air quantity for an air-handling system shall be calculated as the sum of

(a) the outdoor air quantity required for spaces in the scope of this standard as calculated in Section 7.1(a)(6)(i) plus

(b) the design outdoor air intake flow ( $V_{dz}$ ) required for spaces in the scope of ASHRAE Standard 62.1 as calculated by ASHRAE Standard 62.1.

**Informative Note:** The calculation method specified in Section 7.1(a)(6)(i) does not use diversity ( $D$ ), zone air distribution effectiveness ( $E_z$ ), and system ventilation efficiency ( $E_v$ ) from ASHRAE Standard 62.1.

### Revise Section 8.1(a)(6) as shown.

8.1 Specialized Outpatient Facility Requirements. [...]

- a. Spaces shall be ventilated according to Table 8-1. [...]
6. For air-handling systems serving multiple spaces, system minimum outdoor air quantity shall be calculated using one of the following methods:

i. For systems serving only spaces within the scope of this standard, system minimum outdoor air quantity for an air-handling system shall be calculated as the sum of the individual space requirements as defined by this standard.

ii. System minimum outdoor air quantity shall be calculated by the Ventilation Rate Procedure (multiple zone formula) of ASHRAE Standard 62.1<sup>1</sup>. The minimum outdoor air change rate listed in this standard shall be interpreted as the zone outdoor airflow ( $V_{oz}$ ) for purposes of this calculation.

- ii. For systems serving spaces both in this standard and in ASHRAE Standard 62.1, system minimum outdoor air quantity for an air-handling system shall be calculated as the sum of  
(a) the outdoor air quantity required for spaces in the scope of this standard as calculated in Section 8.1(a)(6)(i) plus  
(b) the design outdoor air intake flow ( $V_{dz}$ ) required for spaces in the scope of ASHRAE Standard 62.1 as calculated by ASHRAE Standard 62.1.  
**Informative Note:** The calculation method specified in Section 8.1(a)(6)(i) does not use diversity ( $D$ ), zone air distribution effectiveness ( $E_z$ ), and system ventilation efficiency ( $E_v$ ) from ASHRAE Standard 62.1.

### Revise Section 8.2(a)(6) and 8.2(a)(7) as shown.

8.2 General Outpatient Facility Requirements. [...]

The following requirements shall apply for space ventilation:

- a. Spaces shall be ventilated according to Table 8-2. [...]
6. For air-handling systems utilizing the cfm/person and cfm/ft<sup>2</sup> outdoor air ventilation rates serving spaces listed in Table 8-2 or spaces listed in Table 8-2 and ASHRAE Standard 62.1, system minimum outdoor air quantity shall be calculated by the Ventilation Rate Procedure of ASHRAE Standard 62.1<sup>1</sup>. The cfm/person rate shall be considered the  $R_p$  value, and the cfm/ft<sup>2</sup> rate shall be considered the  $R_a$  value in the calculation. [...]

7. For air-handling systems serving multiple spaces and utilizing the "Minimum Outdoor a/c" column, system minimum outdoor air quantity shall be calculated using one of the following methods:

i. For systems serving only spaces within the scope of this standard, system minimum outdoor air quantity for an air-handling system shall be calculated as the sum of the individual space requirements as defined by this standard.

ii. System minimum outdoor air quantity shall be calculated by the Ventilation Rate Procedure (multiple zone formula) of ASHRAE Standard 62.1<sup>1</sup>. The minimum outdoor air change rate listed in this standard shall be interpreted as the zone outdoor airflow ( $V_{oz}$ ) for purposes of this calculation.

iii. For systems serving spaces both in this standard and in ASHRAE Standard 62.1, system minimum outdoor air quantity for an air-handling system shall be calculated as the sum of  
(a) the outdoor air quantity required for spaces in the scope of this standard as calculated in Section 8.2(a)(7)(i) plus  
(b) the design outdoor air intake flow ( $V_{dz}$ ) required for spaces in the scope of ASHRAE Standard 62.1 as calculated by ASHRAE Standard 62.1.

**Informative Note:** The calculation method specified in Section 8.2(a)(7)(i) does not use diversity ( $D$ ), zone air distribution effectiveness ( $E_z$ ), and system ventilation efficiency ( $E_v$ ) from ASHRAE Standard 62.1.

### Revise Section 9.1(a)(6) as shown.

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

- a. Spaces shall be ventilated according to Table 9-1. [...]

6. For air-handling systems serving multiple spaces, system minimum outdoor air quantity shall be calculated using one of the following methods:

i. For systems serving only spaces within the scope of this standard, system minimum outdoor air quantity for an air-handling system shall be calculated as the sum of the individual space requirements as defined by this standard.

ii. System minimum outdoor air quantity shall be calculated by the Ventilation Rate Procedure (multiple zone formula) of ASHRAE Standard 62.1<sup>1</sup>. The minimum outdoor air change rate listed in this standard shall be interpreted as the zone outdoor airflow ( $V_{oz}$ ) for purposes of this calculation.

iii. For systems serving spaces both in this standard and in ASHRAE Standard 62.1, system minimum outdoor air quantity for an air-handling system shall be calculated as the sum of

© ASHRAE. Per international copyright law, additional reproduction, distribution, or transmission in either print or digital form is not permitted without ASHRAE's prior written permission.

(a) the outdoor air quantity required for spaces in the scope of this standard as calculated in Section 9.1(a)(6)(i) plus

(b) the design outdoor air intake flow ( $V_{dz}$ ) required for spaces in the scope of ASHRAE Standard 62.1 as calculated by ASHRAE Standard 62.1.

**Informative Note:** The calculation method specified in Section 9.1(a)(6)(i) does not use diversity ( $D$ ), zone air distribution effectiveness ( $E_z$ ), and system ventilation efficiency ( $E_v$ ) from ASHRAE Standard 62.1.

**\*Combination of 62.1 and 170**

**\*170 Calcs pushing toward 62.1 MZ Calcs**

# 2021-Addendum e (September 30, 2022)

## Addendum e to Standard 170-2021

Add a new Section 6.10 as shown.

### 6.10 Fan-Assisted Natural Ventilation

**6.10.1 General Requirements.** Using outdoor air through natural ventilation intakes as a means of supply air is acceptable for spaces listed in Table 6-3, provided that the air is mechanically removed from the space and meets pressure relationships, minimum total ach, and design temperature and humidity ranges listed in the "Reference Table" column. All spaces designed for natural ventilation shall include a mechanical ventilation system designed in accordance with this standard except as noted below.

**6.10.2 Intakes.** Fan-assisted natural ventilation intakes shall meet the following requirements:

- Intakes shall be at least ten (10) times the crack/leakage area of the space and have a maximum face velocity of 100 fpm (0.508 m/s) at the minimum total air change rate required by this standard. (**Informative Note:** The 100 fpm (0.508 m/s) is a sizing criterion not an operational limit. Refer to 2021 ASHRAE Handbook—Fundamentals, Chapter 16 for information regarding crack/leakage area of the space.)
- The device that is mechanically removing the air shall remain operational when the intake is open.
- Intakes shall be limited to those dimensions allowable by the local authority having jurisdiction.
- The natural ventilation design shall maintain the pressure relationships required in Tables 7-1, 8-1, 8-2, and 9-1 with adjacent spaces.
- Intakes shall include a screening device designed to prevent intrusion by insects and vermin.
- Intakes shall be located such that the minimum separation distance between the intake to any specific potential outdoor contaminant source shall be equal to or greater than the separation distance listed in Table 6-1.

#### Exceptions to 6.10.2(f):

- As allowed by Section 6.3.1.1, Exception 3.
- The minimum separation distance between landscaped grade and a natural ventilation air intake shall be 3 ft (1 m).

# Natural Ventilation

Table 6-3. Spaces Acceptable for Natural Ventilation

Function of Space	Reference Table
General patient room	7-1
General exam room	7-1
Physical therapy	7-1
Patient bedroom	7-1
Resident room	7-1
Examination/observation	8-1
Urgent care exam	8-2
Urgent care observation	8-2
General examination room	8-2
Psychiatric examination room	8-2
Psychiatric consultation room	8-2
Psychiatric group room	8-2
Psychiatric seclusion room	8-2
Physical therapy individual room	8-2
Physical therapy exercise area	8-2
Hydrotherapy	8-2
Physical therapeutic pool	8-2
Speech therapy room	8-2
Occupational therapy room	8-2
Prosthetics and orthotics room	8-2
Dental treatment	8-2
Other dental treatment areas	8-2
Toilet room	8-2
Occupational therapy	9-1
Resident living/activity/dining	9-1
Resident room	9-1
Physical therapy	9-1
Resident corridor	9-1
Toilet/bathing room	9-1

# 2021-Addendum e (September 30, 2022)

# Natural Ventilation

**6.10.3 Filtration.** Fan-assisted natural ventilation air introduced in accordance with Section 6.10.1 is exempt from meeting the requirements of Section 6.4, provided it is part of a system meeting the requirements in this section.

**6.10.4 Condensation Mitigation.** Interior air barriers, insulation, or other means that separate fan-assisted naturally ventilated spaces from mechanically cooled spaces shall be provided, such that condensation does not occur on indoor surfaces.

**6.10.5 Outdoor Air Quality.** Fan-assisted natural ventilation air introduced in accordance with Section 6.10.1 shall meet the following requirements:

- a. Comply with ASHRAE Standard 62.1, Section 4.
- b. Compliance with ASHRAE Standard 62.1, Section 4.3(b)(8) shall include identification of potential biological contaminant sources.

**Informative Note:** Monitoring PM10 and/or PM2.5 with local sensors can be helpful in implementing natural ventilation.

***Revise Informative Appendix E as shown. The remainder of Informative Appendix E is unchanged.***

ASHRAE. 2017b2021. *ASHRAE Handbook—Fundamentals*. Atlanta: Peachtree Corners, GA: ASHRAE.



# 2021-Addendum g

# Hybrid O.R.

## (September 30, 2022)

### Update to definition of Hybrid Operating Room

#### Addendum g to Standard 170-2021

*Add the following new definition to Section 3 as shown. The remainder of Section 3 is unchanged.*

***hybrid operating room:*** a room that meets the definition of an *operating room (OR)* and has permanently installed equipment to enable diagnostic imaging before, during, and after surgical procedures. ***(Informative***

***Note:*** This space is functionally equivalent to Class 3 Imaging rooms. Imaging equipment may include MRI, fixed single-plane and bi-plane tomographic imaging systems, and computed tomography equipment. Use of portable imaging technology does not make an OR a hybrid operating room.)

*Revise Table 6-2 as shown. The remainder of Table 6-2 is unchanged.*

Table 6-2 Supply Air Outlets

Space Designation (According to Function)	Supply Air Outlet Classification <sup>a</sup>
<u>Operating rooms<sup>b</sup>, procedure rooms</u> <u>Operating rooms and Class 3 Imaging rooms<sup>b</sup></u>	Supply diffusers within the primary supply diffuser array; Group E, nonaspirating; Additional supply diffusers within the room; Group E
<u>Procedure Rooms and Class 2 Imaging rooms</u>	<u>Group E.</u>

# 2021-Addendum g (September 30, 2022)

# Nuclear Medicine

## Nuclear Medicine Treatment and Hot Lab—Exception to requiring exhaust

*Add new Section 7.7 as shown. This matches exactly Section 8.7 in the current standard.*

**7.7 Nuclear Medicine.** Refer to Table 7-1 of this standard for both nuclear medicine treatment spaces and nuclear medicine hot-lab spaces when radiopharmaceutical preparation is performed on site (not premixed) and radioactive materials (radionuclides) are mixed/distributed from their protective containers within this room. When dose administration and preparation uses only low-level premixed radioactive materials, then negative air pressure and room exhaust is not indicated and these nuclear medicine spaces will follow the Class 1 Imaging room space of this standard for ventilation requirements.

*Revise Section 8.4.1 as shown.*

**8.4.1 Operating Rooms (ORs), Operating/Surgical Cystoscopic Rooms, and Caesarean Delivery Rooms—and Class 3 Imaging Rooms.** Refer to Section 7.4.1 of this standard.

*Revise Section 8.7 as shown.*

**8.7 Nuclear Medicine.** Refer to Table 8-1 of this standard for both nuclear medicine treatment spaces and nuclear medicine hot-lab spaces when radiopharmaceutical preparation is performed on site (not premixed) and radioactive materials (radionuclides) are mixed/distributed from their protective containers within this room. ~~If~~ When dose administration ~~and on-site mixing~~ and preparation uses only low-level premixed radioactive materials, then ~~a hot lab~~ negative air pressure and room exhaust is not indicated and these nuclear medicine spaces will follow the ~~general examination~~ Class 1 Imaging room space in Table ~~8-2-8-1~~ of this standard for ventilation requirements.

# 2021-Addendum h (September 30, 2022)

# Outpatient Unoccupied Turndown



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	Yes	MERV-16 (dd)	20-60	68-75/20-24
ED human decontamination (FGI 2.8-3.4.8)	Negative	2	12	Yes	No	Yes (ii)	MERV-14 (cc)	NR	NR
ED exam/treatment room (FGI 2.8-3.4.2) (p)	NR	2	6	NR	NR	Yes (ii)	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	Yes (ii)	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	Yes	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	Yes	MERV-14	20-60	70-75/21-24
Phase I recovery (PACU) (FGI 2.1-3.7.4)	NR	2	6	NR	No	Yes	MERV-8	Max 60	70-75/21-24
Phase II recovery (FGI 2.1-3.7.5) (u)	NR	2	2	NR	NR	Yes	MERV-8	Max 60	70-75/21-24
Preprocedure patient care (FGI 2.1-3.7.3) (t)	NR	2	2	NR	NR	Yes	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	Yes	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	Yes (ii)	MERV-8	Max 60	70-75/21-24

# 2021-Addendum j (July 31, 2023)

# BH and MH New Space Type

Table 7-1 Design Parameters—Inpatient Spaces

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
[...]									
BEHAVIORAL AND MENTAL HEALTH FACILITIES (k)									
Patient bedroom, resident room (FGI 2.2-2.12.2 & 2.5-2.2.2)	NR	2	2	NR	NR	Yes	MERV-8	NR	NR
Seclusion room (FGI 2.1-2.4.3 & 2.2-2.12.4.3)	NR	2	4	NR	NR	Yes	MERV-8	NR	NR
<u>Resident Group/multipurpose/activity/dining</u> (FGI 2.2-3.2.2.3)	<u>NR</u>	<u>2</u>	<u>4</u>	<u>NR</u>	<u>NR</u>	<u>Yes</u>	<u>MERV-8</u>	<u>NR</u>	<u>NR</u>
[...]									



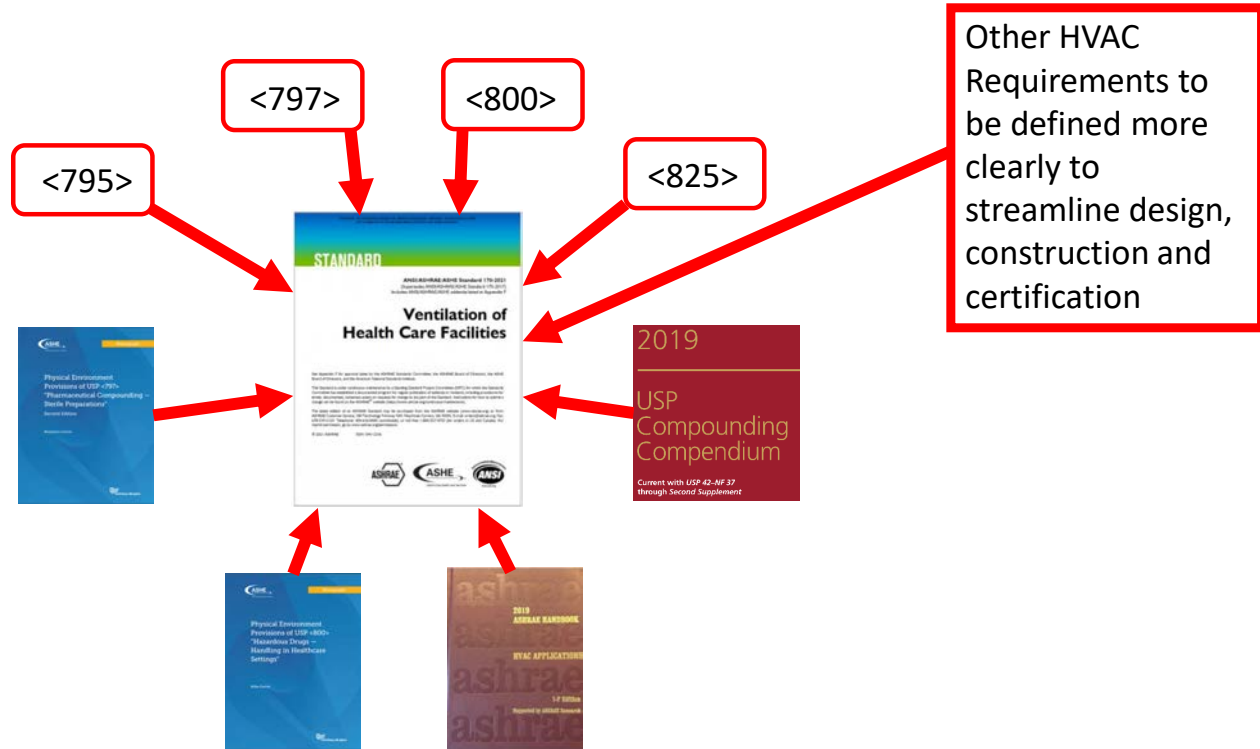
# ASHRAE Addendum Adoption Process

1. Continuous Maintenance
2. Addenda suggested by:  
SSPC committee members  
Submitted by the public through the Change Proposal (CMP) Process
3. Committee Action then Public Review Period
4. ASHE Co-Sponsor Review
5. Approved for Publication



# Current & Potential Future Activities

Pharmacy White Paper Committee Approved for Publication!



39th Annual FPC Seminar + Expo

# Current & Potential Future Activities

## GPC (Guideline Project Committee) 43

### Operations Guideline for Ventilation of Healthcare Facilities

**PURPOSE:** The purpose of this guideline is to provide information and guidance for the operation of ventilation systems that provide environmental control in new and existing health care facilities.

**SCOPE:**

**2.1** This guideline is intended for use by facility operators and those involved in the design, construction, installation, commissioning, management, operation, maintenance, accreditation, inspection, and service of health care facilities. This guideline applies to patient care areas, resident care areas, and related support areas within health care facilities.

**2.2** This guideline 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.

**2.3** This guideline provides guidance for temperature and humidity.

**2.4** This guideline provides guidance for odor control and asepsis.

**2.5** This guideline provides guidance for ventilation rates including, but not limited to outdoor air, to serve health care facilities.

**2.6** This guideline provides guidance for thermal comfort.

**Update: September 4<sup>th</sup>, 2023—Committee Voted and Approved for  
Publication Public Review**

# ASHRAE Standard 241

New Standard : *Control of Infectious Aerosols*

Reduces Risk from Long Range Transmission (not Close Range (<3 ft))

Based on a Risk Model

Geek Out: Population Health Model

Wells Riley Equation iterated by a Monte Carlos Statistical Simulation  
Probability of .1% Chance of Infection for 96.3% of the time.



# ASHRAE Standard 241

Modeling parameters:

112 day seasonal cycle

Community prevalence of 1.04%, with an assumption that 3x higher prevalence in healthcare settings

ECOAi is expressed in CFM/PERSON

Created a framework of assumptions to compare to 170

HC Space	Occupants	Masking	Room Size (sf)	Events/Day
Exam	3	30%	160	10
Group Treatment	20	30%	1,080	5
Patient Room	3	-	320	10
HC Waiting Room	30	30%	1,080	10
Resident	3	-	320	12

Ceiling Height 8'-10"

# ASHRAE Standard 241

Space Type	62/170 Rate cfm/person	New 241 ECOAi cfm/person	Infections Prevented / Season	Occupant Limit if No Upgrade
Exam	16	34	1	1
Group Treatment	16	67	6	5
Patient Room	32	64	1	1
Waiting Room	11	80	33	4
Resident	32	39	.3	2
Auditorium	6	56	13	16 (vs 150)
Gym	23	86	39	48 (vs 180)
Convention	10	62	27	62 (vs 400)

# ASHRAE Standard 241

## Regulatory Considerations:

Was developed on a fast track, non-ANSI approach (limited public review, no obligations to resolve comments)

Now published, intent is to open it to ANSI process at date TBD

Go forward actions will follow ANSI process

## Uses:

Future Pandemic Planning

Endemic Guidance

Evaluate impact of Infection Prevention protocols (occupant limits, masking, etc)

Understand how supplemental equipment can improve staff safety (air cleaners; UV systems)

Reduce huckster-isms

Best Use: SCHOOLS! 30 occupants to 11 occupants or 2.47 to 6.77 Air Changes/Hour in 1,291 sq ft (120 m<sup>2</sup>)

# QUESTIONS?

A cluster of colorful speech bubbles, each containing a question mark, surrounding the central text 'QUESTIONS?'. The bubbles are in various colors including yellow, purple, red, orange, green, pink, and blue. The question marks inside the bubbles are also colored to match their respective bubbles. The central text 'QUESTIONS?' is in a large, bold, black font.

39th Annual FPC Seminar + Expo

**THANK YOU!**