ASHRAE Standard 170 UPDATE: Road to Renewal

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November 17, 2020 AHCA Virtual Conference Presentation

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Impact of Pandemic

COVID 19 - Lessons Learned?

New Addendum s

- ASHRAE Standard 170 worked !
- Benefit of Anterooms for Airborne Infectious Isolation (AII) rooms
- Challenge of adapting rooms to true AII capable (including use of HEPA exhaust)
- Ability to provide once through 100% OA via economizer or conditioned air - in portions of the ED and in other departments (ICU and patient floor(s))
- Ability to provide 100% EA - in portions of the ED and in other departments (ICU and patient floor(s))
- Need for Anterooms for (at least) a dedicated Operating Room, C-Section Room
- Benefit of DDC controls to modify HVAC terminal box parameters (ie change VAV to CV; increase room air changes to highest available by box / system)

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COVID Resources

Recommended Resources

ASHRAE Epidemic Task Force – COVID 19 Guidance with FAQs

ASHE COVID 19 RECOVERY – excellent facility reference tool with checklists!

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History

Standard issued in 2008

First ASHRAE Standard co-sponsored by ASHE

Standard given Continuous Maintenance status

Standard initially incorporated in *2010 Guidelines for Design and Construction of Health Care Facilities*

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History

Republished in 2013

Incorporated into *2014 Guidelines for Design and Construction of Health Care Facilities*

And Republished again in 2017

Incorporated into *2018 Guidelines for Design and Construction of Health Care Facilities*

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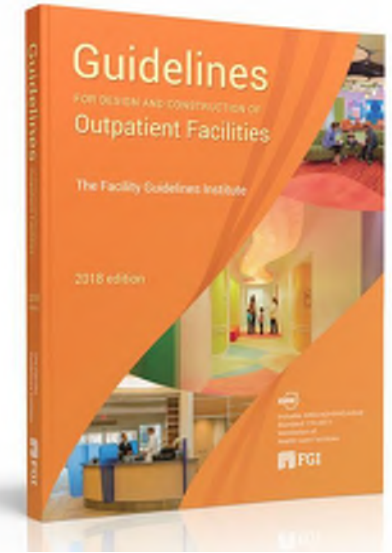
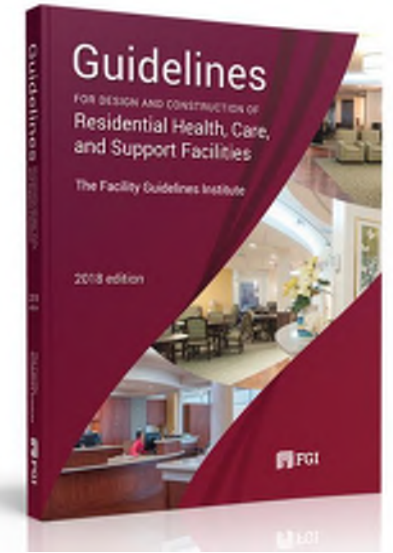
New FGI Guidelines





FGI 2018 is in three books:

- Hospital
- Outpatient
- Residential

170 is included in its entirety in each book.

170 mirrors the books with our Chapters 7-9

Ch 7 Inpatient

Ch 8 Outpatient

Ch 9 Residential

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2020 FLORIDA BUILDING CODE

Adopts the 2018 Guidelines for Design and Construction Health Care Facilities (“FGI Guidelines”) – various volumes

2018 FGI Guidelines includes ASHRAE Std 170-2017

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Addendum Changes Summary – 2013 edition to 2017 edition

a - restrict gas fired equipment flue from 25’ of OA intake

b – revise references to more recent or relevant NFPA codes, USP, etc

c – laboratory work areas – allow use of Z9.5

Add a new reference to Section 9 as follows. The remainder of Section 9 is unchanged.

9. NORMATIVE REFERENCES

13 ANSI/AIHA/ASSE Z9.5-2012 *Laboratory Ventilation Standard*, American Society of Safety Engineers. Park Ridge, IL.

d – revised exhaust discharge requirements:

add Lab Fume Hood discharge velocity criteria

allow re-entrainment analysis to address placement of exhaust less than 25’ from an intake

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Addendum changes – 2013 edition to 2017 edition

e – add clear language regarding switchable rooms

is re-established anytime the space becomes occupied. Controls intended to switch the required pressure relationships between spaces from positive to negative, and vice versa, shall not be permitted. Air change rates in excess of the minimum values are expected in some cases in order to maintain room temperature and humidity conditions based upon the space cooling or heating load.

f – Operating Room diffuser array - improve language defining array area

no more than 30% shall be non-diffuser for area extending 12” beyond table

g – Operating Room FGI coordination

delete “Class A/B/C” references

adopt Invasive Procedure definition

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Addendum changes – 2013 edition to 2017 edition

h – revise temperature ranges for Sterile Processing spaces

Decontamination from 72-78F to 60-73F

Clean Work from 72-78F to 68-73F

Sterile Stores from 72-78F to max 75F

k – add ECT Procedure to Table 7.1

m – allow adiabatic atomizing type humidifiers

ad – revise Exam Room: General Exam Room at 4 ACH Total

Special* Exam Room at 6 ACH Total

(*Undiagnosed GI, Respiratory or Skin Symptoms)

ae – varied clean up "limit leakage" revise to "provide minimum pressure differential"

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ASHRAE Std 170 - The Work Goes On !

Continuous Maintenance Document

Approved Addenda become Part of the Standard

Standard of Care for Designers

Most Informed Design Direction

"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 - 2018 FGI

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Addendum n – 2013:

2017 edition - sleek look belies significant detail

Addendum n:

Bad news: Not incorporated into 2017 edition

Better news: Is now an approved addendum

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Table 7.1 Design Parameters—Hospital Spaces

Function of Space	Pressure Relationsl Adjacent							
SURGERY AND CRITICAL CARE								
Critical and intensive care	NR							
Delivery room (Caesarean) (m), (o)	Positive							
Emergency department decontamination	Negative							
Emergency department exam/treatment room (p)	NR							
Emergency department public waiting area	Negative							
Intermediate care (s)	NR							
Laser eye room	Positive							
Medical/anesthesia gas storage (r)	Negative							
Newborn intensive care	Positive							
Operating room (m), (o)	Positive							
Operating/surgical cystoscopic rooms (m), (o)	Positive	4	20	NR	No	20–60	68–75/20–24	
Procedure room (o), (d)	Positive	3	15	NR	No	20–60	70–75/21–24	
Radiology waiting rooms	Negative	2	12	Yes (q), (w)	NR	Max 60	70–75/21–24	
Recovery room	NR	2	6	NR	No	20–60	70–75/21–24	

Table 8.1 Design Parameters—Outpatient Spaces

Function of Space	Pressure Relationship to Adjacent Areas (n)
SURGERY AND CRITICAL CARE	
Critical and intensive care	NR
Delivery room (Caesarean) (m), (o)	Positive
Emergency department decontamination	Negative
Emergency department exam/treatment room (p)	NR
Emergency department public waiting area	Negative
Intermediate care (s)	NR
Laser eye room	Positive
Medical/anesthesia gas storage (r)	Negative
Newborn intensive care	Positive

Table 9.1 Design Parameters—Nursing Home Spaces

Function of Space	Pressure Relationship to Adjacent Areas (n)	Minimum Outdoor ach	Minimum Total ach
SURGERY AND CRITICAL CARE			
Critical and intensive care	NR	2	6
Delivery room (Caesarean) (m), (o)	Positive	4	20
Emergency department decontamination	Negative	2	12
Emergency department exam/treatment room (p)	NR	2	6
Emergency department public waiting area	Negative	2	12
Intermediate care (s)	NR	2	6
Laser eye room	Positive	3	15
Medical/anesthesia gas storage (r)	Negative	NR	8
Newborn intensive care	Positive	2	6

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Addendum n – 2013

Creates Chapter 7 / 8 / 9 - “Spaces”

7. SPACE VENTILATION – Inpatient Spaces ~~Hospital Spaces~~

The ventilation requirements of this standard are minimums that provide control of environmental comfort, asepsis, and odor in inpatient spaces ~~hospital health care facilities~~. However, because they are minimum requirements and because of the diversity of the population and variations in susceptibility and

8 SPACE VENTILATION –Outpatient Spaces

The ventilation requirements of this standard are minimums that provide control of environmental comfort, asepsis, and odor in outpatient spaces ~~healthcare facilities~~. However, because they are minimum requirements and because of the diversity of the population and variations in susceptibility and sensitivity,

9 SPACE VENTILATION – Resident Health, Care, and Support Spaces ~~Nursing Home Spaces~~

The ventilation requirements of this standard are minimums that provide control of environmental comfort, asepsis, and odor in resident care areas ~~Nursing Home~~ ~~healthcare facilities~~. However, because they are minimum requirements and because of the diversity of the population and variations in susceptibility and sensitivity, these requirements do not provide assured protection from discomfort, airborne transmission of contagions, and odors.

Addendum n – 2013

Creates Chapter 8 - Outpatient Spaces

Function of Space (f)

COMMON SPACES IN OUTPATIENT FACILITIES
General Purpose Examination/Observation Room (3.1-3.2.2)
Special Purpose Examination Room (3.1-3.2.3)
AII Room (i) (3.1-3.4.2)
AII Anteroom (i) (3.1-3.4.3)
Medication Preparation Room programmed to compound sterile preparations (b) (3.1-3.6.6.2)
Clean Supply Storage (3.1-3.6.9)
Soiled Holding Room (3.1-3.6.10)
Laboratory Testing/Work Area if in a separate dedicated room (3.1-4.1.2)
Medical Waste Holding Spaces (3.1-5.4.1.3)
Environmental Services Room (3.1-5.5.1)

SPACES SPECIFIC TO PARTICULAR OUTPATIENT FACILITIES
Freestanding Urgent Care Facility Procedure Room (3.5-3.2.2)
Diagnostic Imaging Waiting Area (3.5-6.1.3.2) (g)
Cancer Treatment Area (p) (3.6-3.2)
OutPatient Surgical Facility Procedure Room (o), (d) (3.7-3.2)
OutPatient Surgical Facility Operating Room (m), (o) (3.7-3.3)
Postoperative Recovery Area (3.7-3.4.3)
Office-Based Procedure Room (p) (3.8-3.1)
Endoscopy Procedure Room (x) (3.9-3.2.2)
Pre-Procedure Patient Care Area (3.9-3.3)
Post-Procedure Recovery Area (3.9-3.3)

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Addendum n – 2013

- Outpatient spaces

4.7 Space Planning. In a building which contains spaces programmed for inpatient use as well as containing spaces programmed for outpatient use, the inpatient care spaces shall be designed solely for inpatient use and the outpatient care spaces shall be designed solely for outpatient use. Individual spaces which are dual programmed for either inpatient use or outpatient use shall meet the design requirements for inpatient use of the space.

Redundancy requirements for Inpatient only

e. In a building which contains a mixture of spaces programmed for Outpatient care as well as spaces programmed for Inpatient care, the Outpatient care spaces shall be designed in accordance with Table 8.1 and the Inpatient care spaces shall be designed in accordance with Table 7.1.

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TABLE 8.1 Design Parameters For Outpatient Specific 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)	Minimum Filter Efficiencies (c)	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
COMMON SPACES IN OUTPATIENT FACILITIES								
General Purpose Examination/Observation Room (3.1-3.2.2)	NR	2	4	NR	NR	7/NR	max 60	70–75/21–24
Special Purpose Examination Room (3.1-3.2.3)	NR	2	6	NR	NR	7/NR	max 60	70–75/21–24
AII Room (i) (3.1-3.4.2)	Negative	2	12	Yes	No	7/NR	max 60	70–75/21–24
AII Anteroom (i) (3.1-3.4.3)	(e)	NR	10	Yes	No	7/NR	NR	NR
Medication Preparation Room programmed to compound sterile preparations (b) (3.1-3.6.6.2)	Positive	2	4	NR	NR	7/ HEPA (s)	NR	NR
Clean Supply Storage (3.1-3.6.9)	Positive	2	4	NR	NR	7/NR	max 60	72–78/22–26
Soiled Holding Room (3.1-3.6.10)	Negative	2	6	Yes	No	7/NR	NR	72–78/22–26
Laboratory Testing/Work Area if in a separate dedicated room (3.1-4.1.2)	Negative	2	6	Yes	NR	7/NR	NR	70–75/21–24
Medical Waste Holding Spaces (3.1-5.4.1.3)	Negative	2	10	Yes	No	7/NR	NR	NR
Environmental Services Room (3.1-5.5.1)	Negative	NR	10	Yes	No	7/NR	NR	NR
Bronchoscopy, sputum collection, and pentamidine administration (n)	Negative	2	12	Yes	No	7/NR	NR	68-73/20-23
Emergency waiting rooms	Negative	2	12	Yes (q)	NR	7/NR	Max. 65	70-75/21-24
SPACES SPECIFIC TO PARTICULAR OUTPATIENT FACILITIES						7/NR		
Freestanding Urgent Care Facility Procedure Room (3.5-3.2.2)	Positive	2	6	NR	No	7/NR	NR	70–75/21–24
Diagnostic Imaging Waiting Area (3.5-6.1.3.2) (g)	Negative	2	12	Yes (q), (r)	NR	7/NR	max 60	70–75/21–24
Cancer Treatment Area (p) (3.6-3.2)	NR	2	6	NR	NR	7/NR	max 60	70–75/21–24
OutPatient Surgical Facility Procedure Room (o), (d) (3.7-3.2)	Positive	3	15	NR	No	7/NR	20–60	70–75/21–24

Addendum n – 2013

6.1.1 Ventilation Upon Loss of Electrical Power for Inpatient Spaces. The space ventilation and pressure relationship requirements of Table 7.1 shall be maintained for the following spaces, even in the event of loss of normal electrical power:

a. AII rooms
b. PE rooms
c. Operating rooms (Class B and C surgery), including delivery rooms (Caesarean)

(For further information, see NFPA [2012] in Informative Appendix B.)

6.1.2 Ventilation Upon Loss of Electrical Power (Outpatient Surgical Facility Operating Room). The space ventilation and pressure relationship requirements of Table 8.1 shall be maintained for outpatient surgical spaces, even in the event of loss of normal electrical power.

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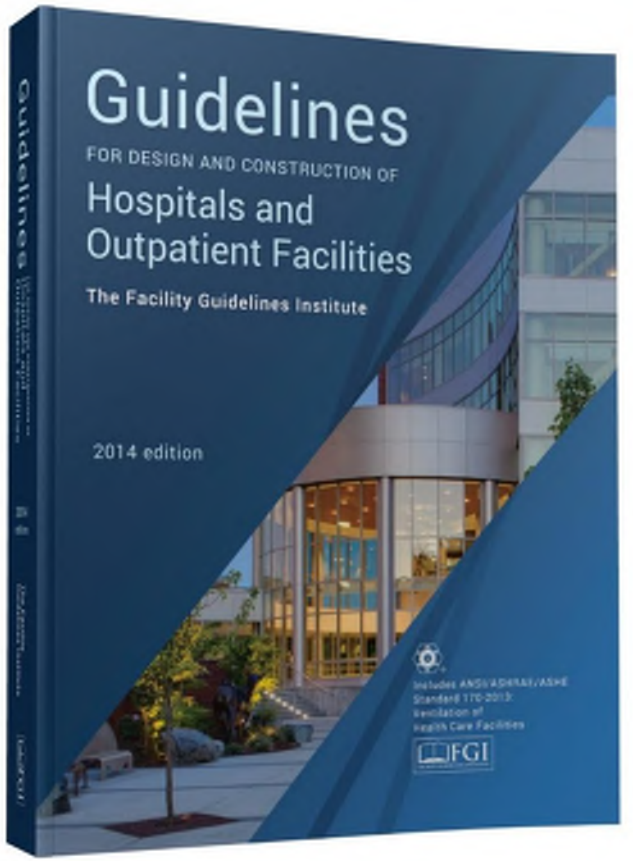
Re-Publication

Late 2020– Incorporates all approved addenda

And Then…..Updated Reference for 2022 FGI Guidelines

New CMPs and Addenda Will Continue After Re-Publication



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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, 20
- ANSI/ASHRAE/ASHE Addendum g for Standard 170-2017 (, 2020)
- ANSI/ASHRAE/ASHE Addendum h for Stand (April 1, 2020)
- ANSI/ASHRAE/ASHE Addendum rd 170-2017 (March 2, 2020)
- ANSI/ASHRAE/ASH k for Standard 170-2017 (August 3, 2020)
- ANSI/AS E Addendum m for Standard 170-2017 (August 3, 2020)
- SHRAE/ASHE Addendum n for Standard 170-2017 (March 3, 2020)
- ANSI/ASHRAE/ASHE Addendum p for Standard 170-2017 (March 2, 2020)
- ANSI/ASHRAE/ASHE Addendum q to Standard 170-2017 (December 13, 2019)

2020 edition will include Addenda a, b, c, d, e, g, h, i, j, k, l, m, n, p, q, r and s

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

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FINE TUNING SCOPE

Addendum q to 170-2017

Revise the Scope (Section 2) of the approved title, purpose and scope (TPS) for Standard 170 as shown below. The remainder of Section 2 is unchanged. The approved TPS for 170 is posted at https://www.ashrae.org/standards-research--technology/standards--guidelines/titles-purposes-and-scopes#SSPC170.

2. SCOPE

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

[…]

2.6 This standard establishes design requirements for ventilation rates ~~the volumetric flow rate of air~~ including, but not limited to outdoor air to serve health care ~~spaces~~ facilities.

2.7 This standard does not establish comprehensive thermal comfort design requirements.

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Addendum p - 2017

Topic – Filtration & Turndown

- Additional of new columns in the Tables !

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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)
~~SURGERY AND CRITICAL CARE~~ NURSING UNITS AND OTHER PATIENT CARE AREAS							
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 ~~D~~delivery room ~~(Caesarean)~~ (2.2-2.11.9) (m), (o)	Positive	4	20	NR	No	Yes	8/14
~~Substerile service area~~ Sterile processing room (2.2-3.3.6.13)	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
~~Critical and intensive care~~ Critical care patient care station (2.2-2.6.2)	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
~~INPATIENT NURSING~~							
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 ~~T~~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

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Addendum a - FURTHER FILTRATION REVISIONS

TABLE 7.1 Design Parameters – Hospital Spaces

Function of Space	Pressure Relationship to Adjacent Areas (n)	Minimum Outdoor ach	Minimum Total ach	All Room Air Exhausted Directly to Outdoors (j)	Air Recirculated by Means of Room Units (a)	Minimum Filter Efficiency (ab)	Design Relative Humidity (k), %	Design Temperature (l), °F/°C
SURGERY AND CRITICAL CARE								
Operating room (m), (o)	Positive	4	20	NR	No	MERV-16 (ac)	20–60	68–75/20–24
Operating/surgical cystoscopic rooms, (m), (o)	Positive	4	20	NR	No	MERV-16	20–60	68–75/20–24
Delivery room (Caesarean) (m), (o)	Positive	4	20	NR	No	MERV-16	20–60	68–75/20–24
Substerile service area	NR	2	6	NR	No	ab	NR	NR
Recovery room	NR	2	6	NR	No	ab	20–60	70–75/21–24
Critical and intensive care	NR	2	6	NR	No	MERV-14	30–60	70–75/21–24
Intermediate care (s)	NR	2	6	NR	NR	MERV-14	max 60	70–75/21–24
Wound intensive care (burn unit)	Positive	2	6	NR	No	HEPA	40–60	70–75/21–24
Newborn intensive care	Positive	2	6	NR	No	MERV-14	30–60	72–78/22–26
Treatment room (p)	NR	2	6	NR	NR	ab	20–60	70–75/21–24
Trauma room (crisis or shock) (c)	Positive	3	15	NR	No	MERV-14	20–60	70–75/21–24
Medical/anesthesia gas storage (r)	Negative	NR	8	Yes	NR	NR	NR	NR
Laser eye room	Positive	3	15	NR	No	MERV-14	20–60	70–75/21–24
Emergency Department public waiting area	Negative	2	12	Yes (q)	NR	ab	max 65	70–75/21–24
Triage	Negative	2	12	Yes (q)	NR	MERV-14	max 60	70–75/21–24
ER decontamination	Negative	2	12	Yes	No	ab	NR	NR
Radiology waiting rooms	Negative	2	12	Yes (q), (w)	NR	ab	max 60	70–75/21–24
Procedure room (o), (d)	Positive	3	15	NR	No	MERV-14	20–60	70–75/21–24
Emergency department exam/treatment room (p)	NR	2	6	NR	NR	ab	max 60	70–75/21–24

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Addendum b - 2017

Topics – Spaces Removed from Table

- Darkroom – gone digital !
- Medical/Anesthesia Gas Storage – refer to NFPA 99
- Food Prep - refer to ASHRAE Std 154

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Addendum c - 2017

Topic – Air Classifications

- Helpful informative appendix info
- Consistency and coordination with ASHRAE Std 62.1

ASHRAE Standard 62.1 categorizes spaces into air classifications and prevents the recirculation and transfer of air under many conditions from spaces with higher air classifications to spaces with lower air classifications based on ASHRAE Standard 62.1, Section 5.16. This appendix includes guidelines on how to apply air classifications to ASHRAE/ASHE Standard 170 spaces.

a. Air classifications should be applied as indicated below and in accordance with ASHRAE Standard 62.1[1] Section 5.16.
b. Recirculation allowances by room units shall be in accordance with the room recirculation requirements of Tables 7.1, 8.1, and 9.1.and Standard 62.1, Section 5.16. (***Informative note:*** This should not be construed to prevent room recirculation of air within the same space when permitted by Standard 170 but prevented by Standard 62.1 air classifications.)
c. Energy recovery devices serving Standard 170 spaces should meet the requirements of Standard 170, Section 6.8.
d. Spaces in Tables 7.1, 8.1, and 9.1 requiring 100% exhaust air should be Class 3 air.

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Addendum d - 2017

6.7.7 Building Exfiltration. Outdoor Air ventilation systems for a building shall be designed such that the total building outdoor air intake equals or exceeds the total building exhaust under all load and unoccupied turndown conditions.

Topic – Intakes and Exhausts

- Coordinate with changing info in ASHRAE Std 62.1
- Consistent ASHRAE technical info across the two standards

Table 6.3.1.1 Air Intake Minimum Separation Distance

Object	Minimum Distance, ft (m)
Class 2 air exhaust/relief outlet	10 (3)
Required exhaust from table 7.1, 8.1, or 9.1 or Class 3 air exhaust/relief outlet	25 (7.5)
Required exhaust from section 6.3.2.2 or Class 4 air exhaust/relief outlet	30 (10)
Plumbing vents terminating less than 3 ft (1 m) above the level of the outdoor air intake	20 (6)
Plumbing vents terminating at least 3 ft (1 m) above the level of the outdoor air intake	6 (1.9)
Vents, chimneys, and flues from combustion appliances and equipment	25(7.5)
Garage Entry, automobile loading area, or drive-in queue	15 (5)
Truck loading area or dock, bus parking/idling area	25 (7.5)
Driveway, landscaped grade, street, or parking place	6 (1.9)
Thoroughfare with high vehicle traffic volume	25 (7.5)
Roof or other above-grade surface directly below intake	3 (1)
Garbage storage/pick-up area, dumpsters	15 (5)
Cooling tower intake or basin	15 (5)
Cooling tower exhaust	25 (7.5)

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Addendum e - 2017

Topic – Planning / Construction / Start-Up /

Re-organized narrative in Ch 5 & Ch 10

5.2 Owner Requirements. Owners/managers of health care facilities shall:

a. **Space Program**. Prepare a space program including the clinical service expected in each space and specific user equipment to be used. Specify needs for temperature, humidity, air filtration, localized and general exhaust, and pressure control that are not covered or are different than the requirements in this standard.

b. **Medical/Clinical Organizations.** Provide specific medical and clinical requirements that are different than the requirements in this standard.

'agraph added to support requirements in stated sections. <

c. **Facility Operational Plan.** Provide an operational plan in event of extended power or fuel outage. See sections 6.1.2.1 and 6.1.2.2.

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Addendum g - 2017

Topic – Ensure that 170 accommodates ICC Mechanical and other jurisdictions

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

a. Spaces shall be ventilated according to Table 7.1.

[. . .]

2. The ventilation requirements in this table are intended to provide for comfort as well as for asepsis and odor control in spaces of a health care facility that directly affect patient care. For spaces not specifically listed here, ventilation requirements shall be that of functionally equivalent spaces in the table. If no functionally equivalent spaces exist in the table, ventilation requirements shall be obtained from ANSI/ASHRAE Standard 62.1[+] in the absence of other codes or standards that govern those space ventilation rate requirements. Where spaces with prescribed rates in both Standard 62.1 and Table 7.1 of this standard exist, the higher of the two air change rates shall be used.

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Addendum h- 2017

Topic – Thermal Comfort

- Provide informative appendix info to assist users in applying ASHRAE Std 55

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Addendum i - 2017

Topic – More clarity in application of Adiabatic high pressure water type humidifiers

Improved technical jargon provided:

Water Temperature re Legionella risk

Water Purity level when discharged to space

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Addendum j - OUTPATIENT

8.1 ~~General Requirements.~~ Specialized Outpatient Facility Requirements. The following facility types shall comply with this section; Outpatient Surgical, Endoscopy, Infusion, Renal Dialysis, Freestanding Emergency Departments and Imaging Facilities with Class 2 and 3 Imaging Rooms. The following general requirements shall apply for space ventilation:

8.2 General Outpatient Facility Requirements. All outpatient facility types other than those indicated in Section 8.1 shall comply with this Section and Table 8.2.
Unless otherwise noted in this section, all requirements for space ventilation of general outpatient spaces are contained within this Section and Table 8.2 and Sections 6, 7, 9 and 10 of this Standard shall not apply. For requirements related to Sections 6 and 10 which are not found in this Section, refer to local and state building codes. Where no local or state code is recognized, the requirements of ANSI/ASHRAE Standard 62.1 [1] shall apply.

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Addendum j - OUTPATIENT(Continued)

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)	Minimum Filter Efficiencies (c)	Design Relative Humidity (k),%	Design Temperature (f), °F/°C
SURGERY AND EMERGENCY DEPT (ED)								
Delivery (Caesarean) (m), (o), (v) *(FGI 2.1-3.2.3)*	Positive	4	20	NR	No	MERV-A-16 (dd)	20–60	68–75/20–24
ED humandecontamination *(FGI 2.8-3.4.8)*	Negative	2	12	Yes	No	MERV-A-14 (cc)	NR	NR
ED exam/treatment room (p) *(FGI 2.8-3.4.2)*	NR	2	6	NR	NR	MERV-A-14 (cc)	Max 60	70–75/21–24
ED public waiting area *(FGI 2.8-6.2.3)*	Negative	2	12	Yes (q)	NR	MERV-A-8	Max 65	70–75/21–24
Operating room (m), (o), (v) *(FGI 2.1-3.2.3)*	Positive	4	20	NR	No	MERV-A-16 (dd)	20–60	68–75/20–24
Procedure room (d), (p) *(FGI 2.1-3.2.2)*	Positive	3	15	NR	No	MERV-A-14	20–60	70–75/21–24
Phase I recovery (PACU) *(FGI 2.1-3.7.4)*	NR	2	6	NR	No	MERV-A-8	Max 60	70–75/21–24
Phase II recovery (u) *(FGI 2.1-3.7.5)*	NR	2	2	NR	NR	MERV-A-8	Max 60	70–75/21–24
Pre-procedure patient care (t) *(FGI 2.1-3.7.3)*	NR	2	2	NR	NR	MERV-A-8	Max 60	70–75/21–24
Trauma room (crisis or shock) (bb) *(FGI 2.8-3.4.4)*	Positive	3	15	NR	No	MERV-A-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	MERV-A-8	Max 60	70–75/21–24
DIAGNOSTIC AND TREATMENT								
Class 1 imaging room *(FGI 2.1-3.5.2.4(1)(b)(i))*	NR	2	6	NR	NR	MERV-A-8	Max 60	70–75/21–24
Class 2 imaging room (d), (p) *(FGI 2.1-3.5.2.4(1)(b)(ii))*	Positive	3	15	NR	No	MERV-A-14	20–60	70–75/21–24
Class 3 imaging room (m), (o) *(FGI 2.1-3.5.2.4(1)(b)(iii))*	Positive	4	20	NR	No	MERV-A-16 (dd)	20–60	68–75/20–24
Diagnostic imaging waiting (g) *(FGI 2.1-3.5.10.4)*	Negative	2	12	Yes (q), (r)	NR	MERV-A-8	Max 60	70–75/21–24

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Addendum j - OUTPATIENT(Continued)

Add Table 8.2 and notes as shown.

Table 8.2 Design Parameters—General Outpatient Spaces (ig)

Function of Space (ii)	Pressure Relationship to Adjacent Areas (ii)	ach design option		All Room Air Exhausted Directly to Outdoors (ij)	AirRecirculated by Means of Room Units (ia)	Minimum Filter Efficiencies (ic)	Design Relative Humidity % (ii)	Design Temperature °F/°C (ik)	Ra:Ra air class design option		
		Min. Outdoor ach (ia)	Min. Total ach (ia)						Air Class (ia)	Ra Cfm/ft² (L/s·m²) Person and Occupant Factor (ia)	Ra Cfm/ft² (L/s·m²) (ia)
GENERAL DIAGNOSTIC AND TREATMENT											
Birthing room *(FGI 2.4-2.2)*	NR	2	3	Yes (ih)	NR	MERV-A-14	Max 60	70–75/21–24	2	10 (5) / 4	0.18 / (0.9)
Urgent care exam (ie) *(FGI 2.5-3.2.1)*	NR	2	3	NR	NR	MERV-A-8	NR	70–75/21–24	2	7.5 (3.8) / 3	0.12 / (0.6)
Urgent care treatment (ie) *(FGI 2.5-3.2.2)*	NR	2	3	NR	NR	MERV-A-8	NR	70–75/21–24	2	7.5 (3.8) / 3	0.18 / (0.9)
Urgent care triage *(FGI 2.5-3.2.3)*	Negative	2	3	Yes	NR	MERV-A-8	Max 60	70–75/21–24	3	10 (5) / 3	0.18 / (0.9)
Urgent care observation *(FGI 2.5-3.3)*	NR	2	2	NR	NR	MERV-A-8	NR	70–75/21–24	2	5 (2.5) / 2	0.12 / (0.6)
General examination room *(FGI 2.1-3.2.1)*	NR	2	2	NR	NR	MERV-A-8	NR	70–75/21–24	1	7.5 (3.8) / 3	0.12 / (0.6)
Specialty IC exam room (ib) *(FGI 2.5-3.2.5)*	Negative	2	3	Yes	NR	MERV-A-8	Max 60	70–75/21–24	3	10 (5) / 3	0.18 / (0.9)
Laboratory work room (il) *(FGI 2.1-4.1.2.1)*	NR	2	3	Yes (ih)	NR	MERV-A-8	NR	70–75/21–24	2	7.5 (3.8) / 2	0.12 / (0.6)
Medication room *(FGI 2.1-5.8.8.2)*	Positive	2	2	NR	NR	MERV-A-8	Max 60	70–75/21–24	1	5 (2.5) / 2	0.18 / (0.9)
Class 1 Imaging rooms (ig) *(FGI 2.1-3.5)*	NR	2	3	NR	NR	MERV-A-8	Max 60	72–78/22–26	1	7.5 (3.8) / 2	0.12 / (0.6)
Psychiatric Examination Room *(FGI 2.11-3.2.2)*	NR	2	3	NR	NR	MERV-A-8	NR	70–75/21–24	1	5 (2.5) / 2	0.06 / (0.3)
Psychiatric Consultation Room *(FGI 2.11-3.2.4)*	NR	2	3	NR	NR	MERV-A-8	NR	70–75/21–24	1	5 (2.5) / 2	0.06 / (0.3)
Psychiatric Group Room *(FGI 2.11-3.2.5)*	NR	2	3	NR	NR	MERV-A-8	NR	70–75/21–24	1	5 (2.5) / 2	0.06 / (0.3)
Psychiatric Seclusion Room *(FGI 2.11-3.2.7)*	NR	2	2	NR	NR	MERV-A-8	NR	70–75/21–24	2	10 (5) / 3	0.12 / (0.6)
ECT procedure room (FGI 2.11-3.2.9.2)	NR	2	2	NR	NR	MERV-A-8	NR	70–75/21–24	1	7.5 (3.8) / 3	0.12 / (0.6)
Physical Therapy Individual Room *(FGI 2.12-3.2.2.1)*	NR	2	3	Yes (ih)	NR	MERV-A-8	NR	70–75/21–24	2	10 (5) / 3	0.12 / (0.6)
Physical Therapy Exercise Area *(FGI 2.12-3.2.3)*	NR	2	3	Yes (ih)	NR	MERV-A-8	NR	70–75/21–24	2	20 (10) / 2	0.18 / (0.9)
Hydrotherapy *(FGI 2.12-3.2.4)*	Negative	2	3	Yes	NR	MERV-A-8	NR	72–80/22–27	3	20 (10) / 2	0.12 / (0.6)
Physical Therapeutic Pool *(FGI 2.12-3.2.4)*	Negative	2	10	Yes	NR	MERV-A-8	NR	72–80/22–27	3	----	0.48 / (2.4)
Speech Therapy Room *(FGI 2.12-3.3.2)*	NR	2	2	NR	NR	MERV-A-8	NR	70–75/21–24	1	5 (2.5) / 2	0.06 / (0.3)
Occupational therapy *(FGI 2.12-3.3)*	NR	2	3	NR	NR	MERV-A-8	NR	70–75/21–24	1	5 (2.5) / 2	0.06 / (0.3)

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Addendum k - Residential

- Status – Committee Vote
- Topic – Coordinating with FGI
    - 170 Chapter 9 table – spaces align with FGI Residential volume
    - *Resolve applicability for specific types (Nursing, Hospice)*

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Addendum “L” - OR & IMAGING COORDINATION W FGI

- Status – Committee Vote
- Topic – Coordinating with FGI
    - Redefine Invasive Procedure
    - Define Hybrid Operating Room
    - Define Class 1 / Class 2 / Class 3 Imaging
        - *de-link from Anesthetic gas use !*

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Addendum “L” - OR & IMAGING COORDINATION W FGI

- *De-link 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, Class 2 & Class 3 Imaging Rooms, ventilation shall be provided at a minimum rate of 2 Outdoor ach and 6 Total ach.

Informative Note: refer to NFPA 99 for WAGD piping and gas scavenging requirements. Note: anesthetic gases commonly refers to nitrous oxide and xenon however, may also include halogenated volatile anesthetic agents such as desflurane, sevoflurane, and isoflurane.

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.

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Addendum “L” - OR & IMAGING COORDINATION W FGI

- Class 1 / Class 2 / Class 3 Imaging

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.

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)	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)(6))*	NR	2	6	NR	NR	Yes	$14	max 60	72–78/22–26
~~Interventional imaging procedure room (2.2-3.5.2)~~ Class 2 imaging room *(d), (g) (FGI 2.2-3.4.2.4(1)(g)(6))*	Positive	3	15	NR	No	Yes	$14	max 60	70–75/21–24
Class 3 imaging room (m), (o) *(FGI 2.2-3.4.2.4(1)(g)(6))*	Positive	4	30	NR	No	Yes	$16 (xx)	max 60	68–75/20–24
~~Interventional and intraoperative MRI procedure room (2.2-3.5.2) replaced by Class 2~~	~~Positive~~	~~3~~	~~15~~	~~NR~~	~~No~~	~~Yes~~	~~$14~~	~~max 60~~	~~70–75/21–24~~
~~Nuclear medicine treatment procedure room (2.2-3.6.1) replaced by Class 1 & negative is NR due to NO open isotopes~~	~~Negative~~	~~2~~	~~6~~	~~Yes~~	~~NR~~	~~Yes~~	~~$14~~	~~NR~~	~~70–75/21–24~~

Addendum “L” - OR & IMAGING COORDINATION W FGI

- Invasive Procedure

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. Requires entry into or opening of a sterile body cavity (i.e., cranium, chest, abdomen, pelvis, joint spaces)
b. Involves insertion of an indwelling foreign body
c. Includes excision and grafting of burns that cover more than 20 percent 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

Informative Note: Invasive procedures are performed in locations suitable to the technical requirements of the procedure with consideration of infection control and anesthetic risks and goals. Accepted standards of patient care are used to determine where an invasive procedure is performed. "Invasive procedure" is a broad term commonly used to describe procedures ranging from a simple injection to a major surgical procedure. For the purposes of this document, the term is limited to the above description. The intent is to differentiate those procedures that carry a high risk of infection, either by exposure of a usually sterile body cavity to the external environment or by implantation of a foreign object(s) into a normally sterile site. Procedures performed through orifices normally colonized with bacteria and percutaneous procedures that do not involve an incision deeper than skin would not be included in this definition.

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Addendum m - OR & IMAGING COORDINATION W FGI

- 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.

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.

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Addendum r - Residential

- Topic – Coordinate with prior addendum
  - Filtration Level for centralized type HVAC units

Function of Space	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)	Minimum Filter Efficiencies (i)	Design Relative Humidity (g), (%)	Design Temperature (h), °F/°C
RESIDENTIAL HEALTH								
NURSING HOMES								
AII room (b)	Negative	2	12	Yes	No	MERV-14	max 60	70–75/21–24
AII anteroom (b)	Negative	NR	10	Yes	No	MERV-~~8~~14	NR	NR
Resident room	NR	2	2	NR	NR	MERV-14	NR	70–75/21–24
Resident living/activity/dining	NR	4	4	NR	NR	MERV-~~8~~14	NR	70–75/21–24
Resident corridor	NR	NR	4	NR	NR	MERV-~~8~~14	NR	NR
Physical therapy	Negative	2	6	NR	NR	MERV-~~8~~14	NR	70–75/21–24
Occupational therapy	NR	2	6	NR	NR	MERV-~~8~~14	NR	70–75/21–24
Toilet/Bathing room	Negative	NR	10	Yes	No	MERV-~~8~~14	NR	70–75/21–24

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Addendum s - Airborne Infectious Isolation Room

- Topic – Improve adaptability for pandemic needs
  - Allow HEPA discharge from A.I.I. room to general exhaust

b. All exhaust air from the AII rooms, associated anterooms, and associated toilet rooms shall be discharged by one of the following methods:

i. Discharged directly to the outdoors without mixing with exhaust air from any other non-AII room or general exhaust system.

ii. 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 6.3.2.1.

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ASHRAE Addendum Adoption Process

Continuous Maintenance

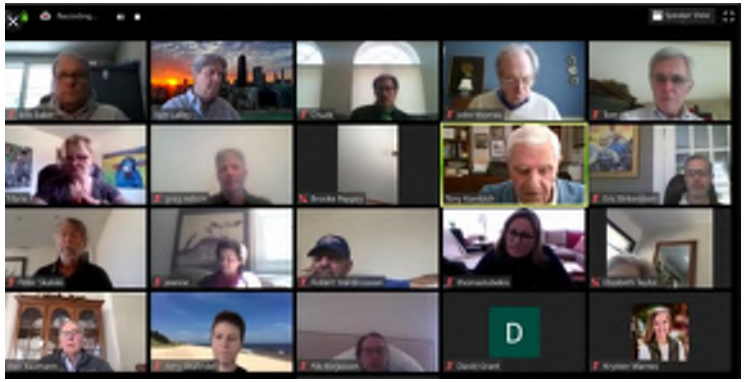
Addenda suggested by:

- SSPC committee members
- Submitted by the public through the Change Proposal (CMP) Process

Committee Action then Public Review Period

ASHE Co-Sponsor Review

Approved for Publication



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Current and Potential Future Activities

Natural Ventilation – Separate Working Group

- 100% OA Impact to Total ACH Requirements?
- Coordinated with ASHRAE 62.1 recent NatVent changes

OR Air Distribution – UPDATE ?

Pharmacy requirements (USP 797 / 800)

RESEARCH: contaminants of concern

RESEARCH: prioritization by space types

RESEARCH: partnerships (so elusive….to get funded and done)

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QUESTIONS ? COMMENTS ?

IDEAS for FUTURE CHANGES ?

Contact: michael.sheerin@tlc-eng.com

THANK YOU AND ENJOY THE VIRTUAL CONFERENCE !

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