

ADDENDA

**ANSI/ASHRAE/ASHE Addendum L to
ANSI/ASHRAE/ASHE Standard 170-2017**

Ventilation of Health Care Facilities

Approved by ASHRAE Standards Committee on November 4, 2020; by the ASHRAE Board of Directors on November 18, 2020; by the American Society for Health Care Engineering on September 30, 2020; and by the American National Standards Institute on February 26, 2021.

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FOREWORD

Addendum L continues the process of reorganizing the standard into three components—Hospital, Outpatient, and Residential Health Care and Support—in alignment with the FGI Guidelines' transition to three separate standards. Addendum L follows the continuing maintenance process in further coordination with FGI and SSPC 170 to create in a coordinated document for use by all stakeholders in the health care community.

This addendum modifies Sections 3, 7, 8 and 9 and incorporate changes previously made by Addenda a and p to Standard 170-2017 as follows:

- a. *Adds Addendum a updated filtration requirements to revised Table 7.1.*
- b. *Adds Addendum p updated unoccupied turndown requirements to revised Table 7.1.*

Revise the space name definitions and process definitions, table organization, and sub-headings to better correlate with the 2018 FGI Guidelines for Design and Construction of Hospitals, including the addition of paragraph numbers after each space name. These revised 2018 FGI paragraph numbers have been coordinated with FGI committee members and will be presented in italicized text to keep them as informative language.

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

Addendum L to Standard 170-2017

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

3. 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.

[...]

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

* **Informative Note:** Definition is adapted from the FGI Guidelines; see FGI (2014) in Appendix B.

- d. Does not begin as an open procedure but has a recognized measurable risk of requiring conversion to an open procedure

Informative Notes:

1. 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.
2. Definition is adapted from the FGI Guidelines; see FGI (2018) in Appendix D.

~~**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.)~~

[...]

~~**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 (2018) in Appendix D.) 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.~~

[...]

~~**procedure room*:** a room designated for the performance of patient care that requires high-level disinfection or sterile instruments and some environmental controls but is not required to be performed with the environmental controls of an operating room. (**Informative Note:** Definition is adapted from the FGI Guidelines; see FGI [2018] in Appendix D.) procedures that do not meet the definition of "invasive procedure" and may be performed outside the restricted area of a surgical suite and may require the use of sterile instruments or supplies. Local anesthesia and minimal and moderate sedation may be administered in a procedure room as long as special ventilation or waste-anesthesia gas disposal systems are not required for anesthetic agents used in these rooms.~~

[...]

~~**restricted area*:** a designated space in the semirestricted area of the surgical suite that can only be accessed through a semirestricted area. The restricted access is primarily intended to support a high level of asepsis control, not necessarily for security purposes. Traffic in the restricted area is limited to authorized personnel and patients. Personnel in restricted areas are required to wear surgical attire and cover head and facial hair. Masks are required where open sterile supplies or scrubbed persons may be located. (**Informative Note:** Definition is adapted from the FGI Guidelines; see FGI [2018] in Appendix D.)~~

Revise Section 7.1 as shown. The remainder of Section 7.1 is unchanged.

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

- a. Spaces shall be ventilated according to Table 7.1.

[...]

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 minimum 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.)

Revise Section 7.4.1 as shown. The remainder of Section 7.4.1 is unchanged.

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.

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.~~

Revise Section 8.1 as shown. The remainder of Section 8.1 is unchanged.

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

- a. Spaces shall be ventilated according to Table 8.1.

[. . .]

7. Unless a higher ventilation rate is stipulated in Table 8.1 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 minimum 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.)

Revise Normative Note "I" for Table 8.1 as shown.

Normative Notes for Table 8.1:

[. . .]

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

[. . .]

Deletes Section 8.4.3 as shown.

~~**8.4.3 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.~~

Delete Section 9.4.3 as shown.

~~**9.4.3 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.

Modify Table 7.1 as shown. The remainder of Table 7.1 is unchanged.

Table 7.1 Design Parameters—Inpatient Spaces

Function of Space (ee)	Pressure Relationship to Adjacent Areas (m)	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 [i] [b] [iii])	NR (xy)	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	15	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 [i] [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 [i] [b] [iii])	Positive	4	20	NR	No	Yes	16 (xxx)	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
[...]									

Note: NR = no requirement

Normative Notes for Table 7.1:

- [...]
- 1. 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.)*

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ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating Standards and Guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.

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