ASHRAE Table 7-1 Design Parameters

Function of Space	Pressure Relationship to Adjacent Areas (n)	Min. Outdoor ach	Min. Total ach	All Room Air Exhausted Directly to Outdoors (j)		Air Recirculated by Means of Room Units (a)		RH (k), %	Design Temperature (l),°F/°C	Current Reference Standard		Referenced Standard	Modified	
				Yes	N/R	No	N/R			Yes	No		Yes	No
SURGERY AND CRITICAL CARE														
Classes B and C operating rooms, (m), (n), (o)	+	4	20		●	●		30-60	68-75/20-24		●	2010 FGI		
Classes B and C operating rooms, (m), (o)	+	4	20		●	●		20-60	68-75/20-24	●		ASHRAE addendum e	●	
Operating/Surgical cystopic rooms, (m),(n)(o)	+	4	20		●	●		30-60	68-75/20-24		●	2010 FGI	N/A	
Operating/Surgical cystopic rooms, (m),(o)	+	4	20		●	●		20-60	68-75/20-24	●		ASHRAE addendum e	●	
Delivery room (Caesarean) (m), (n), (o)	+	4	20		●	●		30-60	68-75/20-24		●	2010 FGI	N/A	
Delivery room (Caesarean) (m), (o)	+	4	20		●	●		20-60	68-75/20-24	●		ASHRAE addendum e	●	
Substerile service area	N/R	2	6		●	●		N/R	N/R		●	2010 FGI	N/A	
Recovery room	N/R	2	6		●	●		30-60	70-75/21-24		●	2010 FGI	N/A	
Recovery room	N/R	2	6		●	●		20-60	70-75/21-24	●		2014 FGI	●	
Critical and intensive care	+	2	6		●	●		30-60	70-75/21-24		●	2010 FGI	N/A	
Intermediate Care	N/R	2	6		●		●	Max 60	70-75/21-24	●		2014 FGI	●	
Wound intensive care (burn unit)	+	2	6		●	●		40-60	70-75/21-24		●	2010 FGI	N/A	
Wound intensive care (burn unit)	N/R	2	6		●	●		40-60	70-75/21-24	●		2014 FGI	●	
Newborn intensive care	+	2	6		●	●		30-60	70-75/21-24		●	2010 FGI	N/A	
Newborn intensive care	+	2	6		●	●		30-60	72-78/22-26	●		ASHRAE addendum ae	●	
Treatment room (p)	N/R	2	6		●		●	30-60	70-75/21-24		●	2010 FGI	N/A	
Treatment room (p)	N/R	2	6		●		●	20-60	70-75/21-24	●		2014 FGI	●	
Trauma room (crisis or shock) (c)	+	3	15		●	●		30-60	70-75/21-24		●	2010 FGI	N/A	
Trauma room (crisis or shock) (c)	+	3	15		●	●		20-60	70-75/21-24	●		2014 FGI	●	
Medical/anesthesia gas storage (r)	-	N/R	8	●			●	N/R	N/R		●	2010 FGI	N/A	
Laser eye room	+	3	15		●	●		30-60	70-75/21-24		●	2010 FGI	N/A	
Laser eye room	+	3	15		●	●		20-60	70-75/21-24	●		2014 FGI	●	
ER waiting rooms (q)	-	2	12	●			●	Max 65	70-75/21-24		●	2010 FGI	N/A	
Emergency Department Public Waiting area	-	2	12	●(q)			●	Max 65	70-75/21-24	●		ASHRAE Addendum d	●	
Triage	-	2	12	●			●	Max 60	70-75/21-24		●	2010 FGI	N/A	
Triage	-	2	12	●(q)			●	Max 60	70-75/21-24	●		2014 FGI	●	
ER decontamination	-	2	12	●		●		N/R	N/R		●	2010 FGI	N/A	
Radiology waiting rooms (q)	-	2	12	●			●	Max 60	70-75/21-24		●	2010 FGI	N/A	
Radiology waiting rooms	-	2	12	●(q) (9w)			●	Max 60	70-75/21-24	●		2014 FGI	●	
Class A Operating/ Procedure room (o)(d)	+	3	15		●	●		30-60	70-75/21-24		●	2010 FGI	N/A	
Procedure (Class A Operating) room (o)(d)	+	3	15		●	●		20-60	70-75/21-24	●		2014 FGI	●	
Emergency Department Exam/Treatment Room (p)	-	2	6		●		●	Max 60	70-75/21-24	●		2014 FGI	●●	
INPATIENT ROOMS														
Patient Rooms (s)	N/R	2	6		●		●	Max 60	70-75/21-24		●	2010 FGI	N/A	
Patient Rooms	N/R	2	4 (y)		●		●	Max 60	70-75/21-24	●		2014 FGI	●	
Nourishment Room	N/R	2	●		●		●	N/R	N/R	●		2014 FGI	●●	
Toilet Rooms	-	N/R	10	●		●		N/R	N/R		●	2010 FGI		●
Newborn Nursery Suite	N/R	2	6		●	●		30-60	72-78/22-26		●	2010 FGI		●
Newborn Nursery Suite	N/R	2	6		●	●		30-60	72-78/22-26	●		ASHRAE addendum ae	●	
Continued Care Nursery	N/R	2	6		●	●		30-60	72-78/22-26	●		ASHRAE addendum ae	●	
Protective Environment Room(f),(n), (t)	+	2	12		●	●		Max 60	70-75/21-24		●	2010 FGI	N/A	
Protective Environment Room(t)	+	2	12		●	●		Max 60	70-75/21-24	●		2014 FGI	●	
Protective Environment Ante Room(t)	(e)	N/R	10		●	●		N/R	N/R	●		2014 FGI	●	
All room (e),(n), (u)	-	2	12	●		●		Max 60	70-78/21-24		●	2010 FGI	N/A	
All room (u)	-	2	12	●		●		Max 60	70-75/21-24	●		2014 FGI	●	
Combination AII/PE Room	+	2	12	●		●		Max 60	70-75/21-24	●		2014 FGI	●	
Combination AII/PE Ante Room(t)	(e)	N/R	10	●		●		N/R	N/R	●		2014 FGI	●	
All Isolation Anteroom (t) (u)	N/R	N/R	10	●		●		N/R	N/R		●	2010 FGI	N/A	
All Isolation Anteroom (u)	(e)	N/R	10	●		●		N/R	N/R	●		2014 FGI	Yes	
INPATIENT NURSING														
Labor Delivery/Recovery/Postpartum (LDRP) (s)	N/R	2	6		●		●	Max 60	70-75/21-24	●		2010 FGI		●
Labor/Delivery/recovery (LDR)(s)	N/R	2	6		●		●	Max 60	70-75/21-24	●		2010 FGI		●
Corridor	N/R	2	●		●		●	N/R	N/R		●	2010 FGI	N/A	
Patient Corridor	N/R	2	●		●		●	N/R	N/R	●		2014 FGI	●●	
SKILLED NURSING FACILITY												2010 FGI	N/A	
NURSING FACILITY										●		2014 FGI	●	
Resident Room	N/R	2	2		●		●	N/R	70-75/21-24	●		2010 FGI		●
Resident gathering/activity/dining	N/R	4	4		●		●	N/R	70-75/21-24	●		2010 FGI		●
Resident Unit Corridor	N/R	N/R	4		●		●	N/R	N/R	●		2014 FGI	●	
Physical Therapy	-	2	6		●		●	N/R	70-75/21-24	●		2010 FGI		●
Occupational Therapy	N/R	2	6		●		●	N/R	70-75/21-24	●		2010 FGI		●
Bathing	-	N/R	10	●			●	N/R	70-75/21-24	●		2010 FGI		●

Table 7-1 Design Parameters

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				Yes	N/R	No	N/R			Yes	No		Yes	No
RADIOLOGY														
X-ray(Diagnostic and Treatment)	N/R	2	6		●		●	Max 60	72-78/22-26	●		2010 FGI		●
X-ray(surgery/critical care and catheterization)	+	3	15		●		●	Max 60	70-75/21-24	●		2010 FGI		●
Darkroom (g)	N/R	2	10	●		●		N/R	N/R	●		2010 FGI		●
DIAGNOSTIC AND TREATMENT														
Bronchoscopy, sputum collection, and pentamidine administration (n)	-	2	12	●		●		N/R	68-73/20-23		●	N/A	N/A	
Bronchoscopy, sputum collection, and pentamidine administration	-	**2**	**12**	●		●		**N/R**	**68-75/20-24**	●		**ASHRAE ADDENDUM e**	●	
Laboratory, general (v)	-	2	6		●	●		N/R	70-75/21-24		●	2010 FGI	N/A	
Laboratory, general (v)	-	**2**	**6**		●			**N/R**	**70-75/21-24**	●		**2014 FGI**	●	
Laboratory, bacteriology (v)	-	2	6	●		●		N/R	70-75/21-24		●	2010 FGI	N/A	
Laboratory, bacteriology (v)	-	**2**	**6**	●			●	**N/R**	**70-75/21-24**	●		**2014 FGI**	●	
Laboratory, biochemistry (v)	-	2	6	●		●		N/R	70-75/21-24		●	2010 FGI	N/A	
Laboratory, biochemistry (v)	-	**2**	**6**	●			●	**N/R**	**70-75/21-24**	●		**2014 FGI**	●	
Laboratory, cytology (v)	-	2	6	●		●		N/R	70-75/21-24		●	2010 FGI	N/A	
Laboratory, cytology (v)	-	**2**	**6**	●			●	**N/R**	**70-75/21-24**	●		**2014 FGI**	●	
Laboratory, glasswashing	-	2	10	●		●		N/R	N/R		●	2010 FGI	N/A	
Laboratory, glasswashing	-	**2**	**10**	●			●	**N/R**	**N/R**	●		**2014 FGI**	●	
Laboratory, histology (v)	-	2	6	●		●		N/R	70-75/21-24		●	2010 FGI	N/A	
Laboratory, histology (v)	-	**2**	**6**	●			●	**N/R**	**70-75/21-24**	●		**2014 FGI**	●	
Laboratory, microbiology (v)	-	2	6	●		●		N/R	70-75/21-24		●	2010 FGI	N/A	
Laboratory, microbiology (v)	-	**2**	**6**	●			●	N/R	70-75/21-24	●		**2014 FGI**	●	
Laboratory, nuclear medicine (v)	-	2	6	●		●		N/R	70-75/21-24		●	2010 FGI	N/A	
Laboratory, nuclear medicine (v)	-	**2**	**6**	●			●	**N/R**	**70-75/21-24**	●		**2014 FGI**	●	
Laboratory, pathology (v)	-	2	6	●		●		N/R	70-75/21-24		●	2010 FGI	N/A	
Laboratory, pathology (v)	-	**2**	**6**	●			●	**N/R**	**70-75/21-24**	●		**2014 FGI**	●	
Laboratory, serology (v)	-	2	6	●		●		N/R	70-75/21-24		●	2010 FGI	N/A	
Laboratory, serology (v)	-	**2**	**6**	●			●	**N/R**	**70-75/21-24**	●		**2014 FGI**	●	
Laboratory, sterilizing	-	2	10	●		●		N/R	70-75/21-24		●	2010 FGI	N/A	
Laboratory, sterilizing	-	**2**	**10**	●			●	**N/R**	**70-75/21-24**	●		**2014 FGI**	●	
Laboratory, media transfer (v)	-	2	4		●	●		N/R	70-75/21-24		●	2010 FGI	N/A	
Laboratory, media transfer (v)	-	**2**	**4**		●		●	**N/R**	**70-75/21-24**	●		**2014 FGI**	●	
Autopsy room (n)	-	2	12	●		●		N/R	68-73/20-23		●	2010 FGI	N/A	
Autopsy room	-	**2**	**12**	●		●		**N/R**	**68-75/20-24**	●		**ASHRAE ADDENDUM e**	●	
Nonrefrigerated body-holding room (h)	-	N/R	10	●		●		N/R	70-75/21-24	●	●	**2010 FGI**		●
Pharmacy (b)	+	2	4		●		●	N/R	N/R	●	●	**2010 FGI**		●
Examination room	N/R	2	6		●		●	Max 60	70-75/21-24	●	●	**2010 FGI**		●
Medication room	+	2	4		●		●	Max 60	70-75/21-24		●	2010 FGI	N/A	
Medication room	N/R	**2**	**4**		●		●	**Max 60**	**70-75/21-24**	●		**2014 FGI**	●	
DIAGNOSTIC AND TREATMENT														
Endoscopy	+	2	15		●	●		30-60	68-73/20-23		●	2010 FGI	N/A	
Gastrointestinal endoscopy procedure room (x)	N/R	**2**	**6**		●	●		**20-60**	**68-73/20-23**	●		**2014 FGI**	●	
Endoscope cleaning	-	2	10	●		●		N/R	N/R	●		**2010 FGI**		●
Treatment room	N/R	2	6		●		●	Max 60	70-75/21-24	●		**2010 FGI**		●
Hydrotherapy	-	2	6		●		●	N/R	72-80/22-27	●		**2010 FGI**		●
Physical therapy	-	2	6		●		●	Max 65	72-80/22-27	●		**2010 FGI**		●
STERILIZING														
Sterilizer Equipment Room	-	N/R	10	●		●		N/R	N/R	●		**2010 FGI**		●
CENTRAL MEDICAL AND SURGICAL SUPPLY														
Soiled or decontamination room	-	2	6	●			●	N/R	72-78/22-26	●		**2010 FGI**		●
Clean workroom	+	2	4		●	●		Max 60	72-78/22-26	●		**2010 FGI**		●
Sterile storage	+	2	4		●		●	Max 60	72-78/22-26	●		**2010 FGI**		●
SERVICE														
Food preparation center (i)	N/R	N/R	10		●	●		N/R	72-78/22-26	●		**2010 FGI**		●
Warewashing	-	N/R	10	●		●		N/R	N/R	●		**2010 FGI**		●
Dietary storage	N/R	N/R	2		●		●	N/R	72-78/22-26	●		**2010 FGI**		●
Laundry, general	-	2	10	●		●		N/R	N/R	●		**2010 FGI**		●
Soiled linen sorting and storage	-	N/R	10	●		●		N/R	N/R	●		**2010 FGI**		●
Clean linen storage	+	N/R	2		●		●	N/R	72-78/22-26	●		**2010 FGI**		●
Linen and trash chute room	-	N/R	10	●		●		N/R	N/R	●		**2010 FGI**		●
Bedpan room	-	N/R	10	●		●		N/R	N/R	●		**2010 FGI**		●
Bathroom	-	N/R	10	●		●		N/R	72-78/22-26	●		**2010 FGI**		●
Janitor's closet	-	N/R	10	●		●		N/R	N/R	●		**2010 FGI**		●

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				Yes	N/R	No	N/R			Yes	No		Yes	No
SUPPORT SPACE														
Soiled Workroom or Soiled Holding	-	2	10	•		•		N/R	N/R	•		2010 FGI		•
Clean Workroom or clean holding	+	2	4		•		•	N/R	N/R	•		2010 FGI		•
Hazardous Material Storage	-	2	10	•		•		N/R	N/R	•		2010 FGI		•

Legend

••	New Category listed in 2014 FGI and not included as part of FGI 2010
+	Positive Pressure Relationship to Adjacent Areas
-	Negative Pressure Relationship to Adjacent Areas
N/R	Not required

FGI Update 2014

ASHRAE Addenda

Notes for Table 7.1:

a. Except where indicated by a "No" in this column, recirculating room HVAC units (with heating or cooling coils) are acceptable for providing that portion of the minimum total air changes per hour that is permitted by Section 7.1 (subparagraph [a][5]). Because of the cleaning difficulty and potential for build up of contamination, recirculating room units shall not be used in areas marked "No." Recirculating devices with HEPA filters shall be permitted in existing facilities as interim, supplemental environmental controls to meet requirements for the control of airborne infectious agents. The design of either portable or fixed systems should prevent stagnation and short circuiting of airflow. The design of such systems shall also allow for easy access for scheduled preventative maintenance and cleaning.

b. Pharmacy compounding areas may have additional air change, differential pressure, and filtering requirements beyond the minimum of this table depending on the type of pharmacy, the regulatory requirements which may include adoption of USP 797), the associated level of risk of the work (see USP [2013] in Informative Appendix B), and the equipment utilized in the spaces.

c. The term trauma room as used herein is a first-aid room and/or emergency room used for general initial treatment of accident victims. The operating room within the trauma center that is routinely used for emergency surgery is considered to be an operating room by this standard.

d. Pressure relationships need not be maintained when the room is unoccupied.

e. See Section 7.2 and its subsections for pressure-relationship requirements.

f. This letter is not used in this table.

g. All air need not be exhausted if darkroom equipment has a scavenging exhaust duct attached and meets ventilation standards regarding NIOSH, OSHA, and local employee exposure limits.2,3

h. A nonrefrigerated body-holding room is applicable only to facilities that do not perform autopsies on-site and use the space for short periods while waiting for the body to be transferred.

i. Minimum total air changes per hour (ach) shall be that required to provide proper makeup air to kitchen exhaust systems as specified in ANSI/ASHRAE Standard 154.4 In some cases, excess exfiltration or infiltration to or from exit corridors compromises the exit corridor restrictions of NFPA90A,5 the pressure requirements of NFPA 96,6 or the maximum defined in the table. During operation, a reduction to the number of air changes to any extent required for odor control shall be permitted when the space is not in use. (See FGI [2010] in Informative Appendix B.)

j. In some areas with potential contamination and/or odor problems, exhaust air shall be discharged directly to the outdoors and not recirculated to other areas. Individual circumstances may require special consideration for air exhausted to the outdoors. To satisfy exhaust needs, constant replacement air from the outdoors is necessary when the system is in operation.

k. The RH ranges listed are the minimum and/or maximum allowable at any point within the design temperature range required for that space.

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

m. National Institute for Occupational Safety and Health (NIOSH) criteria documents regarding occupational exposure to waste an esthetic gases and vapors, and control of occupational exposure to nitrous oxide 7 indicate a need for both local exhaust (scavenging) systems and general ventilation of the areas in which the respective gases are utilized. Refer to NFPA 99 for other requirements.8

n. If pressure-monitoring device alarms are installed, allowances shall be made to prevent nuisance alarms. Short-term excursions from required pressure relationships shall be allowed while doors are moving or temporarily open. Simple visual methods such as smoke trail, ball-in-tube, or flutter strip shall be permitted for verification of airflow direction.

o. Surgeons or surgical procedures may require room temperatures, ventilation rates, humidity ranges, and/or air distribution methods that exceed the minimum indicated ranges.

p. Treatment rooms used for bronchoscopy shall be treated as bronchoscopy rooms. Treatment rooms used for procedures with nitrous oxide shall contain provisions for exhausting anesthetic waste gases.

q. In a recirculating ventilation system, HEPA filters shall be permitted instead of exhausting the air from these spaces to the outdoors provided that the return air passes through the HEPA filters before it is introduced into any other spaces. The entire minimum total air changes per hour of recirculating airflow shall pass through HEPA filters. When these areas are open to larger, nonwaiting spaces, the exhaust air volume shall be calculated based on the seating area of the waiting area. (Note: The intent here is to not require the volume calculation to include a very large space [e.g., an atrium] just because a waiting area opens onto it.)

r. See NFPA 99 for further requirements.8

s. For intermediate care, labor/delivery/recovery rooms, and labor/delivery/recovery/postpartum rooms, four total ach shall be permitted when supplemental heating and/or cooling systems (radiant heating and cooling, baseboard heating, etc.) are used.

t. The protective environment airflow design specifications protect the patient from common environmental airborne infectious microbes (i.e., Aspergillus spores). Recirculation HEPA filters shall be permitted to increase the equivalent room air exchanges; however, the outdoor air changes are still required. Constant-volume airflow is required for consistent ventilation for the protected environment. The pressure relationship to adjacent areas shall remain unchanged if the PE room is utilized as a normal patient room. Rooms with reversible airflow provisions for the purpose of switching between protective environment and All functions shall not be permitted.

u. The All room described in this standard shall be used for isolating the airborne spread of infectious diseases, such as measles, varicella, or tuberculosis. Supplemental recirculating devices using HEPA filters shall be permitted in the All room to increase the equivalent room air exchanges; however, the minimum outdoor air changes of Table 7.1 are still required. All rooms that are retrofitted from standard patient rooms from which it is impractical to exhaust directly outdoors may be recirculated with air from the All room, provided that air first passes through a HEPA filter. When the All room is not utilized for airborne infection isolation, the pressure relationship to adjacent areas, when measured with the door closed, shall remain unchanged and the minimum total air change rate shall be 6 ach.

v. When required, appropriate hoods and exhaust devices for the removal of noxious gases or chemical vapors shall be provided in accordance with NFPA 99.8

w. The requirement that all room air is exhausted directly to outdoors applies only to radiology waiting rooms programmed to hold patients who are waiting for chest x-rays for diagnosis of respiratory disease.

x. If the planned space is designated in the organization's operational plan to be utilized for both bronchoscopy and gastrointestinal endoscopy, the design parameters for "bronchoscopy, sputum collection, and pentamidine administration" shall be used.

y. For single-bed patient rooms using Group D diffusers, a minimum of six total ach shall be provided and calculated based on the volume from finished floor to 6 ft (1.83 m) above the floor.