TABLE 7-1 Design Parameters

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)	RH (k), %	Design Temperature (l), °F/°C
Examination room	N/R	2	6	N/R	N/R	max 60	70–75/21–24
Medication room	Positive	2	4	N/R	N/R	max 60	70–75/21–24
Endoscopy	Positive	2	15	N/R	No	30-60	68–73/20–23
Endoscope cleaning	Negative	2	10	Yes	No	N/R	N/R
Treatment room	N/R	2	6	N/R	N/R	max 60	70–75/21–24
Hydrotherapy	Negative	2	6	N/R	N/R	N/R	72–80/22–27
Physical therapy	Negative	2	6	N/R	N/R	Max 65	72–80/22–27
STERILIZING							
Sterilizer equipment room	Negative	N/R	10	Yes	No	N/R	N/R
CENTRAL MEDICAL AND SURGICAL SUPPLY							
Soiled or decontamination room	Negative	2	6	Yes	No	N/R	72–78/22–26
Clean workroom	Positive	2	4	N/R	No	max 60	72–78/22–26
Sterile storage	Positive	2	4	N/R	N/R	max 60	72–78/22–26
SERVICE							
Food preparation center (i)	N/R	2	10	N/R	No	N/R	72–78/22–26
Warewashing	Negative	N/R	10	Yes	No	N/R	N/R
Dietary storage	N/R	N/R	2	N/R	No	N/R	72–78/22–26
Laundry, general	Negative	2	10	Yes	No	N/R	N/R
Soiled linen sorting and storage	Negative	N/R	10	Yes	No	N/R	N/R
Clean linen storage	Positive	N/R	2	N/R	N/R	N/R	72–78/22–26
Linen and trash chute room	Negative	N/R	10	Yes	No	N/R	N/R
Bedpan room	Negative	N/R	10	Yes	No	N/R	N/R
Bathroom	Negative	N/R	10	Yes	No	N/R	72–78/22–26
Janitor's closet	Negative	N/R	10	Yes	No	N/R	N/R
SUPPORT SPACE							
Soiled workroom or soiled holding	Negative	2	10	Yes	No	N/R	N/R
Clean workroom or clean holding	Positive	2	4	N/R	N/R	N/R	N/R
Hazardous material storage	Negative	2	10	Yes	No	N/R	N/R

Note: N/R = no requirement

TABLE 7-1 Design Parameters

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)	RH (k), %	Design Temperature (l), °F/°C
Corridor	N/R	N/R	2	N/R	N/R	N/R	N/R
SKILLED NURSING FACILITY							
Resident room	N/R	2	2	N/R	N/R	N/R	70–75/21–24
Resident gathering/activity/dining	N/R	4	4	N/R	N/R	N/R	70–75/21–24
Physical therapy	Negative	2	6	N/R	N/R	N/R	70–75/21–24
Occupational therapy	N/R	2	6	N/R	N/R	N/R	70–75/21–24
Bathing room	Negative	N/R	10	Yes	N/R	N/R	70–75/21–24
RADIOLOGY (v)							
X-ray (diagnostic and treatment)	N/R	2	6	N/R	N/R	max 60	72–78/22–26
X-ray (surgery/critical care and catheterization)	Positive	3	15	N/R	No	max 60	70–75/21–24
Darkroom (g)	Negative	2	10	Yes	No	N/R	N/R
DIAGNOSTIC AND TREATMENT							
Bronchoscopy, sputum collection, and pentamidine administration (n)	Negative	2	12	Yes	No	N/R	68–73/20–23
Laboratory, general (v)	Negative	2	6	N/R	No	N/R	70–75/21–24
Laboratory, bacteriology (v)	Negative	2	6	Yes	No	N/R	70–75/21–24
Laboratory, biochemistry (v)	Negative	2	6	Yes	No	N/R	70–75/21–24
Laboratory, cytology (v)	Negative	2	6	Yes	No	N/R	70–75/21–24
Laboratory, glasswashing	Negative	2	10	Yes	No	N/R	N/R
Laboratory, histology (v)	Negative	2	6	Yes	No	N/R	70–75/21–24
Laboratory, microbiology (v)	Negative	2	6	Yes	No	N/R	70–75/21–24
Laboratory, nuclear medicine (v)	Negative	2	6	Yes	No	N/R	70–75/21–24
Laboratory, pathology (v)	Negative	2	6	Yes	No	N/R	70–75/21–24
Laboratory, serology (v)	Negative	2	6	Yes	No	N/R	70–75/21–24
Laboratory, sterilizing	Negative	2	10	Yes	No	N/R	70–75/21–24
Laboratory, media transfer (v)	Positive	2	4	N/R	No	N/R	68–75/20–24
Autopsy room (n)	Negative	2	12	Yes	No	N/R	70–75/21–24
Nonrefrigerated body-holding room (h)	Negative	N/R	10	Yes	No	N/R	N/R
Pharmacy (b)	Positive	2	4	N/R	N/R	N/R	

Note: N/R = no requirement

TABLE 7-1 Design Parameters

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)	RH (k), %	Design Temperature (l), °F/°C
SURGERY AND CRITICAL CARE							
Classes B and C operating rooms, (m), (n), (o)	Positive	4	20	N/R	No	30–60	68–75/20–24
Operating/surgical cystoscopic rooms, (m), (n) (o)	Positive	4	20	N/R	No	30–60	68–75/20–24
Delivery room (Caesarean) (m), (n), (o)	Positive	4	20	N/R	No	30–60	68–75/20–24
Substerile service area	N/R	2	6	N/R	No	N/R	N/R
Recovery room	N/R	2	6	N/R	No	30–60	70–75/21–24
Critical and intensive care	Positive	2	6	N/R	No	30–60	70–75/21–24
Wound intensive care (burn unit)	Positive	2	6	N/R	No	40–60	70–75/21–24
Newborn intensive care	Positive	2	6	N/R	No	30–60	70–75/21–24
Treatment room (p)	N/R	2	6	N/R	N/R	30–60	70–75/21–24
Trauma room (crisis or shock) (c)	Positive	3	15	N/R	No	30–60	70–75/21–24
Medical/anesthesia gas storage (r)	Negative	N/R	8	Yes	N/R	N/R	N/R
Laser eye room	Positive	3	15	N/R	No	30–60	70–75/21–24
ER waiting rooms (q)	Negative	2	12	Yes	N/R	max 65	70–75/21–24
Triage	Negative	2	12	Yes	N/R	max 60	70–75/21–24
ER decontamination	Negative	2	12	Yes	No	N/R	N/R
Radiology waiting rooms (q)	Negative	2	12	Yes	N/R	max 60	70–75/21–24
Class A Operating/Procedure room (o), (d)	Positive	3	15	N/R	No	30–60	70–75/21–24
INPATIENT NURSING							
Patient room (s)	N/R	2	6	N/R	N/R	max 60	70–75/21–24
Toilet room	Negative	N/R	10	Yes	No	N/R	N/R
Newborn nursery suite	N/R	2	6	N/R	No	30–60	72–78/22–26
Protective environment room (f), (n), (t)	Positive	2	12	N/R	No	max 60	70–75/21–24
AII room (e), (n), (u)	Negative	2	12	Yes	No	max 60	70–75/21–24
AII isolation anteroom (t) (u)	N/R	N/R	10	Yes	No	N/R	N/R
Labor/delivery/recovery/postpartum (LDRP) (s)	N/R	2	6	N/R	N/R	max 60	70–75/21–24
Labor/delivery/recovery (LDR) (s)	N/R	2	6	N/R	N/R	max 60	70–75/21–24

Note: N/R = no requirement

Table 7-1 Notes:

a. Recirculating room HVAC units (with heating or cooling coils) are acceptable to achieve the required air change rates. Because of the cleaning difficulty and the potential for buildup of contamination, recirculating room units shall not be used in areas marked "No." Isolation and intensive care unit rooms may be ventilated by reheat induction units in which only the primary air supplied from a central system passes through the reheat unit. Gravity-type heating or cooling units, such as radiators or convectors, shall not be used in operating rooms and other special care areas.

b. Pharmacy compounding areas may have additional air change 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 797), 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. Some isolation rooms may be provided with a separate anteroom, but an ante room is not required by this standard.

f. Protective environment rooms are those used for high-risk immunocompromised patients. Such rooms are positively pressurized relative to all adjoining spaces to protect the patient.

g. Exception: 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 NFPA 90A,[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 AIA [2006] in Informative Annex B: Bibliography.)

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, for example, intensive care units in which patients with pulmonary infection are treated and rooms for burn patients. 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 maximum limits where control is specifically needed.

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 anesthetic 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 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 flutterstrip shall be permitted for verification of airflow direction. 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.

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 the return air passes through the HEPA filters before it is introduced into any other spaces. This requirement applies only to waiting rooms programmed to hold patients awaiting chest x-rays for diagnosis of respiratory disease.

r. See NFPA 99 for further requirements.[8]

s. For patient rooms, 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. If the design criteria indicate that AII is necessary for protective environment patients, an anteroom should be provided. Rooms with reversible airflow provisions for the purpose of switching between protective environment and AII functions shall not be permitted.

u. The AII room described in this standard shall be used for isolating the airborne spread of infectious diseases, such as measles, varicella, or tuberculosis. The design of AII rooms shall include the provision for normal patient care during periods not requiring isolation precautions. Supplemental recirculating devices using HEPA filters shall be permitted in the patient room to increase the equivalent room air exchanges; however, the outdoor air changes are still required. AII rooms that are retrofitted from standard patient rooms from which it is impractical to exhaust directly outside may be recirculated with air from the AII room, provided that the air first passes through a HEPA filter. HEPA filtered exhaust air from AII rooms may mix with exhaust air that serves non-AII spaces prior to being discharged directly outdoors. Rooms with reversible airflow provisions for the purpose of switching between protective environment and AII functions shall not be permitted. See the guidelines in Informative Annex B: Bibliography for more information.

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]