**Section 250.2480 Mechanical**

a) General

1) Mechanical systems shall be tested, balanced, and operated to demonstrate that the installation and performance of these systems conform to the requirements of the plans and specifications.

2) Upon completion of the contract, the owner shall obtain a complete set of manufacturer's installation, operating, maintenance, and preventive maintenance instructions and a parts list with numbers and a description for each piece of equipment. The owner shall also obtain instruction in the operational use of the systems and equipment as required.

b) Thermal and Acoustical Insulation

1) Insulation shall be provided for the following that are located within the building:

A) Boilers, smoke breeching, and stacks.

B) Steam supply and condensate return piping.

C) Hot water piping above 120° F and all hot water heaters, generators, and converters. Exposed hot water supplies to fixtures need not be insulated except where exposed to contact by the physically handicapped.

D) Chilled water, refrigerant, other process piping, and equipment operating with fluid temperatures below ambient dew point.

E) Water supply, storm, and drainage piping on which condensation may occur.

F) Air ducts and casings with outside surface temperature below ambient dew point.

G) Other piping, ducts, and equipment as necessary to maintain the efficiency of the system.

2) Insulation on cold surfaces shall include an exterior vapor barrier.

3) Insulation, including finishes and adhesives on exterior surfaces of ducts and equipment, shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less as determined by an independent testing laboratory in accordance with NFPA 255, Standard Method of Test of Surface Burning Characteristics of Building Materials.

A) Pipe insulation shall have a flame spread rating of 25 or less and a smoke developed rating of 150 or less.

B) All construction exposed to air flow in air distribution plenums shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less.

4) No duct linings shall be permitted downstream of the 90% filters serving areas requiring 90% filtration.

c) Steam and Hot Water Systems

1) Boilers shall have the capacity to supply the normal requirements of all systems and equipment. The number and arrangement of boilers shall be such that when one boiler breaks down or is temporarily taken out of service, the capacity of the remaining boilers shall be sufficient to provide hot water service for clinical, dietary, and patient use; steam for sterilization and dietary purposes; heating for surgery, delivery, labor, recovery, intensive care, nursery, and general patient rooms.

2) Boiler feed pumps, heating circulating pumps, condensate return pumps and fuel oil pumps shall be connected and installed to provide normal and standby service.

3) Supply and return mains and risers of cooling, heating, and process steam systems shall be valved to isolate the various sections of each system. Each piece of equipment shall be valved at supply and return ends.

4) Humidifiers used in conjunction with air handling systems shall be of the direct steam injection type.

d) Air Conditioning, Heating and Ventilating Systems

1) This Part is intended to provide a comfortable, clean, controlled environment for the hospital by employing the most economical and energy efficient systems consistent with these minimum requirements.

A) The minimum requirements as set forth in this Part in no way relieve the designer from providing system capacities and components as required to maintain control of air quality, odor, ventilation rates, space temperatures, and space humidity as set forth in this Part.

B) The design of air conditioning, heating and ventilation systems shall be based on no less than the recommended outdoor design conditions listed in the ASHRAE Handbook of Fundamentals for 99% occurrence (winter) and 1% occurrence (summer).

2) Ventilation Systems

A) Air handling systems shall conform to NFPA 90A, Standard for Installation of Air Conditioning and Ventilating Systems.

B) Fire dampers, smoke dampers, and smoke control systems shall be constructed, located, and installed in accordance with the requirements of NFPA 90A, Standard for Installation of Air Conditioning and Ventilating Systems.

C) Ducts that penetrate construction intended for x-ray or other ray protection shall preserve the effectiveness of the protection.

D) Outdoor air intakes shall be located at least 15 feet from exhaust outlets of ventilation systems, combustion equipment stacks, medical/surgical vacuum systems, or plumbing vents, or from areas that may collect vehicular exhaust or other noxious fumes unless other provisions are made to minimize recirculation of exhaust into outdoor air intakes. Plumbing and vacuum vents that terminate above the level of the top of the air intake shall be located no closer than 10 feet. The bottom of outdoor air intakes serving central systems shall be located as high as practical but at least 6feet above ground level, or if installed above the roof, 3 feet above the roof level.

E) Exhaust outlets from areas that may be contaminated by dangerous or noxious dust, fumes, mists, gases, odors, infectious material, or other contaminants harmful to people shall be above the roof level. The discharge to the atmosphere shall be located as far as possible but not less than 25 feet from any operable window, door, and/or outdoor intake for a fan that discharges air to an occupied space.

F) The ventilation systems shall be designed and balanced to provide the ventilation and pressure relationships specified in this Section.

G) If the ventilation rates required (as specified in this Section) do not provide sufficient make-up air for use by hoods, safety cabinets, and exhaust fans, the additional make-up air shall be provided to maintain required pressure balance.

H) An all-outdoor air system may be used where required by local codes, provided that some form of air-to-air or air-to-water heat recovery system will be included to reclaim the energy otherwise discharged with the air exhausted to the outside.

I) To provide maximum energy conservation, air supplied to patient care areas not required as make-up air for 100% exhaust systems shall be recirculated. Any air within the hospital that is circulated between patient rooms, or patient rooms and other areas of the hospital, shall pass through filters having an efficiency of 90% (see subsection (d)(3) on filters).

J) To provide maximum energy conservation, air supplied to housekeeping, administration and other nonsensitive areas not required as make-up air for 100% exhaust systems shall be recirculated. These areas require filters having a minimum efficiency of 30% on the inlet side of the air handling unit.

K) When a central system serves areas with different filtration requirements, the most stringent filtration requirement shall be provided for the complete system.

L) All outside air supplied to patient care areas shall pass through 90% filters (see subsection (d)(3) on filters).

M) Minimum air circulation requirements indicated in this Section are applicable to occupied spaces. During unoccupied periods, minimum air circulation may be provided as required to maintain space design temperature conditions.

N) Where fan coil or terminal room unit systems are provided in areas to be occupied by patients, through-the-wall outside air ventilation is not acceptable. A separate central ventilation system, with final filters having a minimum efficiency of 90%, shall supply the required outdoor air ventilation.

3) Filters

A) All central ventilation or air conditioning systems shall be equipped with filters having efficiencies no less than those specified in the area requirements.

B) Where two filter beds are required, filter bed No. 1 shall be located upstream of the conditioning equipment and filter bed No. 2 shall be located downstream of the supply fan and conditioning equipment.

C) Where only one filter bed is required, it shall be located upstream of the air conditioning equipment.

D) All filter efficiencies shall be average atmospheric dust spot efficiencies tested in accordance with ASHRAE Handbook of Fundamentals.

E) Filter frames shall be durable and shall provide an airtight fit with the enclosing duct work. All joints between filter segments and enclosing duct work shall be gasketed or sealed to provide a positive seal against air leakage.

F) A local indicating device shall be installed across each filter bed serving central air systems to measure the static pressure drop across the bed.

e) Area Requirements

1) Administration, Public Area, Medical Records, and Housekeeping Offices.

A) Filters:

|  |  |  |
| --- | --- | --- |
| i) | Central ventilation systems shall be provided with prefilters having a minimum efficiency of | 30% |
|  |  |  |
| ii) | Units that recirculate air within a room shall be provided with filters having a minimum efficiency of | 10% |

B) Space Design Conditions:

|  |  |  |
| --- | --- | --- |
| i) | Temperature, dry bulb | 75° |
|  |  |  |
| ii) | Relative Humidity, winter, minimum | 30% |
|  |  |  |
| iii) | Relative Humidity, summer, maximum | 60% |

C) Air Circulation:

i) Total air supplied to each space shall be as required to maintain space design conditions.

ii) Outdoor air supplied shall be no less than 20% of the total air supplied.

D) Space Pressurization:

|  |  |  |
| --- | --- | --- |
|  | Ventilation system shall be designed and balanced so that space pressure, in relation to surrounding areas of the building, is | neutral |
|  |  |  |
| E) | Recirculation of air within room permitted | yes |

2) Laboratories

A) Filters:

|  |  |  |
| --- | --- | --- |
| i) | Central ventilation systems shall be provided with prefilters having a minimum efficiency of | 30% |
|  | and final filters having a minimum efficiency of | 90% |
|  |  |  |
| ii) | Units that recirculate air within a room shall be provided with filters having a minimum |  |
|  | efficiency of | 30% |

B) Space Design Conditions:

|  |  |  |
| --- | --- | --- |
| i) | Temperature, dry bulb | 75° |
|  |  |  |
| ii) | Relative Humidity, winter, minimum | 30% |
|  |  |  |
| iii) | Relative Humidity, summer, maximum | 60% |

C) Air Circulation:

i) Total air supplied to each space shall be as required to maintain space design conditions.

ii) Outdoor air supplied shall be no less than 20% of the total air supplied.

D) Space Pressurization:

|  |  |  |
| --- | --- | --- |
|  | Ventilation system shall be designed and balanced so that space pressure, in relation to surrounding areas of the building, is | negative |
|  |  |  |
| E) | Recirculation of air within room permitted except in areas, as listed below, where all air must be exhausted directly to the outdoors | yes |

F) Air from the following areas shall be exhausted directly to the outdoors:

i) All fume hoods

ii) Histology

iii) Bacteriology

iv) Glass-washing areas

G) All air exhausted from fume hoods shall be made up with outside air.

H) Laboratory hoods shall meet the following general requirements:

i) Have an average face velocity of not less than 75 feet per minute;

ii) Be connected to an exhaust system that is separate from the building exhaust system;

iii) Have an exhaust duct system of noncombustible, corrosion-resistant material consistent with the usage of the hood; and

iv) Have the exhaust fan located at the discharge end of the duct system unless provided with welded stainless steel duct from fan outlet to termination.

I) Laboratory hoods shall meet the following special requirements:

i) Each hood that processes infectious or radioactive materials shall have a minimum face velocity of 100 feet per minute, shall be connected to an independent exhaust system, shall be provided with filters with 99.97 percent efficiency (based on the DOD, dioctylphthalate test method as described in DOD Penetration Test Method MIL STD 282: Filtered Units, Protective Clothing, Gas-Mask Components and Related Products: Performance Test Methods) in the exhaust system, and shall be designed and equipped to permit the safe removal, disposal and replacement of contaminated filters.

ii) Duct systems serving hoods in which radioactive and/or strong oxidizing agents such as prechloric or nitric acid are used shall be constructed of stainless steel and shall be equipped with wash-down facilities.

3) Morgue and Autopsy Suite

A) Filters:

|  |  |
| --- | --- |
| Central ventilation systems shall be provided with prefilters having a minimum efficiency of | 30% |
| and final filters having a minimum efficiency of | 90% |

B) Space Design Conditions:

|  |  |  |
| --- | --- | --- |
| i) | Temperature, dry bulb | 75° |
|  |  |  |
| ii) | Relative Humidity, winter, minimum | 30% |
|  |  |  |
| iii) | Relative Humidity, summer, maximum | 60% |

C) Air Circulation:

i) Total air supplied to each space shall be as required to maintain space design conditions.

ii) Outdoor air supplied shall be no less than 20% of the total air supplied.

D) Space Pressurization:

|  |  |  |
| --- | --- | --- |
|  | Ventilation system shall be designed and balanced so that space pressure, in relation to surrounding areas of the building, is | negative |
|  |  |  |
| E) | Recirculation of air within room permitted | no |

F) Air from the following areas shall be exhausted directly to the outdoors:

i) Autopsy

ii) Non-refrigerated body holding rooms

4) Radiology Suite; X-Ray Diagnostic, Fluoroscopy, and Special Procedures

A) Filters:

|  |  |  |
| --- | --- | --- |
| i) | Central ventilation systems shall be provided with prefilters having a minimum efficiency of | 30% |
|  | and final filters having a minimum efficiency of | 90% |
|  |  |  |
| ii) | Units that recirculate air within a room shall be provided with filters having a minimum efficiency of | 30% |
|  |  |  |
| iii) | The exhaust from isotope storage shall be provided with filters with 99.97% efficiency (based on the DOD, dioctylphthalatetest method as described in DOD Penetration Test Method MIL STD 282: Filter Units, Protective Clothing, Gas-Mask Components and Related Products: Performance Test Methods). |  |

B) Space Design Conditions:

|  |  |  |
| --- | --- | --- |
| i) | Temperature, dry bulb | 75° |
|  |  |  |
| ii) | Relative Humidity, winter, minimum | 30% |
|  |  |  |
| iii) | Relative Humidity, summer, maximum | 60% |

C) Air Circulation:

i) Total air supplied to each space shall be as required to maintain space design conditions.

ii) Outdoor air supplied shall be no less than 20% of the total air supplied.

D) Space Pressurization:

|  |  |  |
| --- | --- | --- |
|  | Ventilation system shall be designed and balanced so that space pressure, in relation to surrounding areas of the building, is | neutral |
|  |  |  |
| E) | Recirculation of air within room permitted | yes |

F) Air from the following areas shall be exhausted directly to the outdoors:

Nuclear medicine and isotope storage.

5) Pharmacy Suite

A) Filters:

|  |  |  |
| --- | --- | --- |
| i) | Central ventilation systems shall be provided with prefilters having a minimum efficiency of | 30% |
|  | and final filters having a minimum efficiency of | 90% |
|  |  |  |
| ii) | Units which recirculate air within a room shall be provided with filters having a minimum efficiency of | 30% |

B) Space Design Conditions:

|  |  |  |
| --- | --- | --- |
| i) | Temperature, dry bulb | 75° |
|  |  |  |
| ii) | Relative Humidity, winter, minimum | 30% |
|  |  |  |
| iii) | Relative Humidity, summer, maximum | 60% |

C) Air Circulation:

i) Total air supplied to each space shall be as required to maintain space design conditions.

ii) Outdoor air supplied shall be no less than 20% of the total air supplied.

D) Space Pressurization:

|  |  |  |
| --- | --- | --- |
|  | Ventilation system shall be designed and balanced so that space pressure, in relation to surrounding areas of the building, is | neutral |
|  |  |  |
| E) | Recirculation of air within room permitted | yes |

6) Physical Therapy Suite and Hydrotherapy

A) Filters:

|  |  |  |
| --- | --- | --- |
| i) | Central ventilation systems shall be provided with prefilters having a minimum efficiency of | 30% |
|  | and final filters having a minimum efficiency of | 90% |
|  |  |  |
| ii) | Units that recirculate air within a room shall be provided with filters having a minimum efficiency of | 30% |

B) Space Design Conditions:

|  |  |  |
| --- | --- | --- |
| i) | Temperature, dry bulb | 75° |
|  |  |  |
| ii) | Relative Humidity, winter, minimum | 30% |
|  |  |  |
| iii) | Relative Humidity, summer, maximum | 60% |

C) Air Circulation:

i) Total air supplied to each space shall be as required to maintain space design conditions.

ii) Outdoor air supplied shall be no less than 20% of the total air supplied.

D) Space Pressurization:

|  |  |  |
| --- | --- | --- |
|  | Ventilation system shall be designed and balanced so that space pressure, in relation to surrounding areas of the building, is | negative |
|  |  |  |
| E) | Recirculation of air within room permitted | yes |

7) Occupational Therapy Suite

A) Filters:

|  |  |  |
| --- | --- | --- |
| i) | Central ventilation systems shall be provided with prefilters having a minimum efficiency of | 30% |
|  | and final filters having a minimum efficiency of | 90% |
|  |  |  |
| ii) | Units that recirculate air within a room shall be provided with filters having a minimum efficiency of | 30% |

B) Space Design Conditions:

|  |  |  |
| --- | --- | --- |
| i) | Temperature, dry bulb | 75° |
|  |  |  |
| ii) | Relative Humidity, winter, minimum | 30% |
|  |  |  |
| iii) | Relative Humidity, summer, maximum | 60% |

C) Air Circulation:

i) Total air supplied to each space shall be as required to maintain space design conditions.

ii) Outdoor air supplied shall be no less than 20% of the total air supplied.

D) Space Pressurization:

|  |  |  |
| --- | --- | --- |
|  | Ventilation system shall be designed and balanced so that space pressure, in relation to surrounding areas of the building, is | neutral |
|  |  |  |
| E) | Recirculation of air within room permitted | yes |

8) Nursing Units (including units such as medical, surgical, intensive care, pediatric, psychiatric, obstetric)

A) Filters:

|  |  |  |
| --- | --- | --- |
| i) | Central ventilation systems shall be provided with prefilters having a minimum efficiency of | 30% |
|  | and final filters having a minimum efficiency of | 90% |
|  |  |  |
| ii) | Units that recirculate air within a room shall be provided with filters having a minimum efficiency of | 10% |

B) Space Design Conditions:

|  |  |  |
| --- | --- | --- |
| i) | Temperature, dry bulb | 75° |
|  |  |  |
| ii) | Relative Humidity, winter, minimum | 30% |
|  |  |  |
| iii) | Relative Humidity, summer, maximum | 60% |

C) Air Circulation (Patient Rooms):

|  |  |  |
| --- | --- | --- |
| i) | Total air supplied, cfm per bed | 15 |
|  |  |  |
| ii) | Outdoor air supplied, cfm per bed | 10 |

D) Air Circulation:

i) Total air supplied to each space shall be as required to maintain space design conditions.

ii) Outdoor air supplied shall be no less than 20% of the total air supplied.

E) Space Pressurization:

|  |  |  |
| --- | --- | --- |
|  | Ventilation system shall be designed and balanced so that space pressure, in relation to surrounding areas of the building, is | neutral |
|  |  |  |
| F) | Recirculation of air within room permitted | yes |

G) Isolation Rooms: These rooms may be used two ways: to protect the patient from the hospital environment or to protect the hospital environment from the patient. Isolation rooms shall have the same conditions as other patient rooms, except that air flow shall be capable of being either into the room or out of the room. When the hospital is being protected (communicable disease), all air shall be exhausted directly to the outdoors.

9) Newborn Care Unit

A) Filters:

|  |  |  |
| --- | --- | --- |
| i) | Central ventilation systems shall be provided with prefilters having a minimum efficiency of | 30% |
|  | and final filters having a minimum efficiency of | 90% |
|  |  |  |
| ii) | Units that recirculate air within a room shall be provided with filters having a minimum efficiency of | 30% |

B) Space Design Conditions:

|  |  |  |
| --- | --- | --- |
| i) | Temperature, dry bulb | 75° |
|  |  |  |
| ii) | Relative Humidity, winter, minimum | 30% |
|  |  |  |
| iii) | Relative Humidity, summer, maximum | 60% |

C) Air Circulation (Patient Rooms):

|  |  |  |
| --- | --- | --- |
| i) | Total air supplied, cfm per bed | 15 |
|  |  |  |
| ii) | Outdoor air supplied, cfm per bed | 10 |

D) Air Circulation:

i) Total air supplied to each space shall be as required to maintain space design conditions.

ii) Outdoor air supplied shall be no less than 20% of the total air supplied.

E) Space Pressurization:

|  |  |  |
| --- | --- | --- |
|  | Ventilation system shall be designed and balanced so that space pressure, in relation to surrounding areas of the building, is | neutral |
|  |  |  |
| F) | Recirculation of air within room permitted | yes |

10) Surgical Suite-Operating Rooms

A) Filters:

|  |  |  |
| --- | --- | --- |
| i) | Central ventilation systems shall be provided with prefilters having a minimum efficiency of | 30% |
|  | and final filters having a minimum efficiency of | 90% |
|  |  |  |
| ii) | Units that recirculate air within a room shall be provided with filters having a minimum efficiency of | 30% |

B) Space Design Conditions:

|  |  |  |  |
| --- | --- | --- | --- |
| i) | Temperature, dry bulb (adjusted range) | 70°F-76°F | |
|  |  | |  |
| ii) | Relative Humidity, winter, minimum | | 40% |
|  |  | |  |
| iii) | Relative Humidity, summer, maximum | | 60% |

C) Air Circulation:

|  |  |  |
| --- | --- | --- |
| i) | Total air supplied, air changes per hour | 15 |
|  |  |  |
| ii) | Outdoor air supplied shall be no less than 20% of the total air supplied. |  |

D) Space Pressurization:

|  |  |  |
| --- | --- | --- |
|  | Ventilation system shall be designed and balanced so that space pressure, in relation to surrounding areas of the building, is | positive |
|  |  |  |
| E) | Recirculation of air within room permitted | yes |

F) Minimum requirements for all other spaces within the surgical suite shall be the same as required for Nursing Units.

G) The minimum circulation rate for operating rooms shall be based on the lowest 9 feet of room height. Air quantity shall be increased as required to meet greater loads and still maintain the desired space conditions.

H) All operating rooms shall have scavenger systems for removing spent anesthetic gases as per NFPA 99, Standard for Health Care Facilities.

I) Operating rooms' air supply shall be from ceiling outlets near the center of the work area to effectively control air movement. Return air shall be not less than 3 inches nor more than 12 inches from the floor. Each operating room shall have at least two return air inlets located as remotely from each other as practical.

11) Obstetrics Suite

A) Filters:

|  |  |  |
| --- | --- | --- |
| i) | Central ventilation systems shall be provided with prefilters having a minimum efficiency of | 30% |
|  | and final filters having a minimum efficiency of | 90% |
|  |  |  |
| ii) | Units that recirculate air within a room shall be provided with filters having a minimum efficiency of | 30% |

B) Space Design Conditions:

|  |  |  |  |
| --- | --- | --- | --- |
| i) | Temperature, dry bulb (adjusted. range) | 70°F-76°F | |
|  |  | |  |
| ii) | Relative Humidity, winter, minimum | | 30% |
|  |  | |  |
| iii) | Relative Humidity, summer, maximum | | 60% |

C) Air Circulation:

i) Total air supplied to each space shall be as required to maintain space design conditions.

ii) Outdoor air supplied shall be no less than 20% of the total air supplied.

iii) Space Pressurization:

|  |  |  |
| --- | --- | --- |
| iv) | Ventilation system shall be designed and balanced so that space pressure, in relation to surrounding areas of the building, is | neutral |

|  |  |  |
| --- | --- | --- |
| D) | Recirculation of air within room permitted | yes |

E) Delivery rooms' air supply shall be from ceiling outlets near the center of the work area to effectively control air movement. Return air shall be not less than 3 inches nor more than 12 inches from the floor. Each delivery room shall have at least two return air inlets located as remotely from each other as practical.

F) Where anesthetic gases are used, scavenger systems for removing spent anesthetics gases as per NFPA 99, Standard for Health Care Facilities, shall be provided.

G) Delivery rooms where caesarean section is performed shall meet the heating, ventilation, and air conditioning (HVAC) requirements for operating rooms.

12) Emergency Suite

A) Filters:

|  |  |  |
| --- | --- | --- |
| i) | Central ventilation systems shall be provided with prefilters having a minimum efficiency of | 30% |
|  | and final filters having a minimum efficiency of | 90% |
|  |  |  |
| ii) | Units that recirculate air within a room shall be provided with filters having a minimum efficiency of | 10% |

B) Space Design Conditions:

|  |  |  |
| --- | --- | --- |
| i) | Temperature, dry bulb | 75° |
|  |  |  |
| ii) | Relative Humidity, winter, minimum | 30% |
|  |  |  |
| iii) | Relative Humidity, summer, maximum | 60% |

C) Air Circulation:

i) Total air supplied to each space shall be as required to maintain space design conditions.

ii) Outdoor air supplied shall be no less than 20% of the total air supplied.

D) Space Pressurization:

|  |  |  |
| --- | --- | --- |
|  | Ventilation system shall be designed and balanced so that space pressure, in relation to surrounding areas of the building, is | neutral |
|  |  |  |
| E) | Recirculation of air within room permitted | yes |

13) Outpatient Suite

A) Filters:

|  |  |  |
| --- | --- | --- |
| i) | Central ventilation systems shall be provided with prefilters having a minimum efficiency of | 30% |
|  | and final filters having a minimum efficiency of | 90% |
|  |  |  |
| ii) | Units that recirculate air within a room shall be provided with filters having a minimum efficiency of | 10% |

B) Space Design Conditions:

|  |  |  |
| --- | --- | --- |
| i) | Temperature, dry bulb | 75° |
|  |  |  |
| ii) | Relative Humidity, winter, minimum | 30% |
|  |  |  |
| iii) | Relative Humidity, summer, maximum | 60% |

C) Air Circulation:

i) Total air supplied to each space shall be as required to maintain space design conditions.

ii) Outdoor air supplied shall be no less than 20% of the total air supplied.

D) Space Pressurization:

|  |  |  |
| --- | --- | --- |
|  | Ventilation system shall be designed and balanced so that space pressure, in relation to surrounding areas of the building, is | neutral |
|  |  |  |
| E) | Recirculation of air within room permitted | yes |

14) Food Preparation Area

A) Filters:

|  |  |  |
| --- | --- | --- |
|  | Central ventilation systems shall be provided with prefilters having a minimum efficiency of | 30% |
|  | and final filters having a minimum efficiency of | 90% |

B) Space Design Conditions:

|  |  |
| --- | --- |
| Temperature, dry bulb | 75° |

C) Air Circulation:

i) Total air supplied to each space shall be as required to maintain space design conditions.

ii) Outdoor air supplied shall be no less than 20% of the total air supplied.

D) Space Pressurization:

|  |  |  |
| --- | --- | --- |
|  | Ventilation system shall be designed and balanced so that space pressure, in relation to surrounding areas of the building, is | negative |
|  |  |  |
| E) | Recirculation of air within room permitted | no |

F) Dining areas adjacent to the food preparation area shall meet the requirements for Public Areas.

G) If direct make-up hoods (short cycle) are used, all outside air to the hood shall be filtered by 30% minimum efficiency filters and shall not cause cold cooking surfaces, condensation problems, or grease build-up due to cold temperature.

H) Kitchen air exhausted from the space through hoods shall be made up with outside air. Air shall flow into the kitchen to prevent cooking odors from migrating throughout the hospital. Recirculation of air is permissible if a central system is used that serves only the kitchen, cafeteria, and ware-washing area.

I) A dishwasher shall have a separate exhaust that is interlocked with the dishwasher to operate only when the dishwasher operates.

J) Air supply quantity must equal or exceed air exhaust quantity or meet the loads encountered, whichever is greater.

K) During the unoccupied cycle, kitchen temperature shall be maintained at 75ºF plus or minus 10ºF.

L) The hood and duct system for cooking equipment used in processes producing smoke or grease-laden vapors shall comply with NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooling Operations. That portion of the fire extinguishment system required for protection of the duct system may be omitted when all cooking equipment is served by U.L. listed grease extractors.

i) Other exhaust hoods in food preparation centers shall have an exhaust rate of not less than 50 cubic feet per minute per square foot of face area. The face area is the open area from exposed perimeter of hood to the open perimeter of the cooking surface.

ii) Clean-out openings shall be provided at each change in direction and in horizontal sections no more than 20 feet apart in the duct system serving kitchen and food preparation areas.

15) Central Sterile Supply

A) Filters:

|  |  |  |
| --- | --- | --- |
|  | Central ventilation systems shall be provided with prefilters having a minimum efficiency of | 30% |
|  |  |  |
|  | and final filters having a minimum efficiency of | 90% |

B) Space Design Conditions:

|  |  |  |
| --- | --- | --- |
| i) | Temperature, dry bulb (adjusted range) | 75° |
|  |  |  |
| ii) | Relative Humidity, winter, minimum | 30% |
|  |  |  |
| iii) | Relative Humidity, summer, maximum | 60% |

C) Air Circulation:

i) Total air supplied to each space shall be as required to maintain space design conditions.

ii) Outdoor air supplied shall be no less than 20% of the total air supplied.

D) Air flow shall be from the clean area toward the soiled or decontamination area.

E) Sterilization Room:

i) Where only steam autoclaves are installed, the air exhausted from the sterilizer area for heat control may be recirculated through a central system that is provided with filters having a minimum efficiency of 90%.

ii) Where ethylene oxide sterilizers are used, all air contaminated with ethylene oxide above 1 part per million shall be exhausted directly outdoors. No air shall be recirculated that has more than 1 part per million of ethylene oxide present.

16) Linen Services; Laundry

A) Filters:

|  |  |
| --- | --- |
| Central ventilation systems shall be provided with prefilters having a minimum efficiency of | 30% |
| and final filters having a minimum efficiency of | 80% |

B) Space Design Conditions:

|  |  |
| --- | --- |
| Temperature, dry bulb (winter) | 75° |

C) All air from the soiled storage and sorting area shall be exhausted directly to outdoors.

D) Air flow shall be from the clean area to the soiled area. Air from the clean area may be used to make up air exhausted from the soiled area.

E) Air from the clean area may be recirculated within the laundry complex, but shall pass through a lint screen or trap before returning to the air handling unit.

F) The entire laundry ventilation system shall be controlled so that air flow is into the laundry from the hospital.

G) Circulation and ventilation rates may be variable, but sufficient outside air shall be supplied to make up for exhaust. Minimum circulation of unconditioned air at summer design conditions shall be 2 cubic feet per minute per square foot2 or 12 air changes per hour, whichever is larger.

17) Miscellaneous Supporting Areas

A) Space temperatures shall be maintained for occupant comfort.

B) Ventilation systems shall be designed and balanced so that air flows into these spaces from adjacent areas.

C) Anesthesia Storage Rooms:

i) All air shall be exhausted directly to the outdoors.

ii) Minimum exhaust ventilation rates shall be six air changes per hour.

iii) The ventilation system shall conform to the requirements of NFPA 99, Standard for Health Care Facilities , including the option to provide a gravity (non-mechanical) ventilation system.

iv) Supply air makeup for exhaust requirements may be provided from a mechanical ventilation system or by transfer from adjacent areas.

D) Soiled Holding and Work Rooms:

i) All air shall be exhausted directly to the outdoors.

ii) Minimum exhaust ventilation rates shall be 10 air changes per hour.

iii) Supply air makeup for exhaust requirements may be provided from a mechanical ventilation system or by transfer from adjacent areas.

E) Toilet Rooms and Bathrooms:

i) Exhaust air may be recirculated through a central ventilation system that is provided with final filters having a minimum efficiency of 90%. Otherwise, all air shall be exhausted directly to the outdoors.

ii) Minimum exhaust ventilation rate shall be 1.5 cubic feet per minute per square foot of floor area, but no less than 50 cubic feet per minute.

iii) Supply air makeup for exhaust requirements may be provided from a mechanical ventilation system or by transfer from adjacent areas.

F) Janitor Closets, Linen, and Trash Chute Rooms:

i) All air shall be exhausted directly to the outdoors.

ii) Minimum exhaust ventilation rate shall be 1.5 cubic feet per minute per square foot of floor area, but no less than 50 cubic feet per minute.

iii) Supply air makeup for exhaust requirements may be provided from a mechanical ventilation system or by transfer from adjacent areas.

G) Boiler rooms shall be provided with sufficient outdoor air to maintain combustion rates of equipment and limit temperatures in working stations to 97°F effective temperature (97°F and 50% relative humidity or its equivalent) as defined by ASHRAE Handbook of Fundamentals.

H) Rooms containing heat-producing equipment, such as boiler rooms, heater rooms, food preparation centers, laundries, sterilizer rooms, or mechanical equipment rooms, shall be insulated and ventilated to prevent any floor surface above from exceeding a temperature of 100°F.

(Source: Amended at 35 Ill. Reg. 6386, effective March 31, 2011)