**Section 350.2720 Mechanical Systems**

a) Mechanical systems shall be tested, balanced, and operated to demonstrate that the installation and performance of these systems conform to the requirements of this Section.

1) Upon the completion of the contract, the owner shall be furnished with a complete set of manufacturer's operating and preventative maintenance instructions, a parts list with numbers and descriptions for each piece of equipment, and a copy of the air-balance report. A complete set of these documents shall be kept on the premises.

2) The owner shall be provided with instructions in the operational use of the systems and equipment.

b) Thermal and Acoustical Insulation. Thermal and acoustical insulation shall be provided as set forth in the ASHRAE Handbook of Fundamentals and the Handbook of Applications and NFPA 90A. Commercial kitchen grease hoods shall be insulated according to NFPA 96 and in accordance with the insulation manufacturer's installation instructions. Domestic water piping that is accessible to residents shall be insulated as required by the Illinois Accessibility Code. Insulation shall be provided for the following:

1) Boilers, smoke breeching, and stacks;

2) Steam supply and condensate return piping;

3) Hot water piping above l80 degrees Fahrenheit and all water heaters, generators, and convertors;

4) Hot water piping above 125 degrees Fahrenheit that is exposed to contact by residents;

5) Chilled water, refrigerant, other process piping and equipment operating with fluid temperatures below the ambient dew point;

6) Water supply and drainage piping on which condensate may occur;

7) Air ducts and casings with outside surface temperatures below the ambient dew point; and

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

c) Insulation may be omitted from hot water and steam condensate piping that is not subject to contact by residents when the insulation is not necessary for preventing excessive system heat loss or excessive heat gain.

d) Insulation including finishes and adhesives on exterior surfaces of ducts, pipes, 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 the American Society for Testing and Materials Standard E84. Exception: Duct, pipe and equipment coverings shall not be required to meet these requirements if they are located entirely outside of a building, or do not penetrate a wall or roof or do not create an exposure hazard.

e) Steam and Hot Water Systems. Supply and return mains and risers for 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 the supply and return ends.

f) Thermal Hazards. Any surface that is accessible to residents and exceeds a temperature of 140 degrees Fahrenheit (such as radiators, hot water or steam pipes, baseboard heaters, or therapy equipment) shall be provided with partitions, screens, shields, or other means to protect residents from injury. Any protective device shall be designed and installed so that it does not present a fire or safety hazard or adversely affect the safe operation of the equipment.

g) Heating, Ventilating and Air Conditioning Systems

1) *Areas of a nursing home used by residents of the nursing home* shall *be air conditioned and heated by means of operable air-conditioning and heating equipment. The areas subject to this air-conditioning and heating requirement include, without limitation, bedrooms or common areas such as sitting rooms, activity rooms, living rooms, community rooms, and dining rooms.* (Section 3-202(8) of the Act)

A) The mechanical system shall be capable of maintaining a temperature of at least 75 degrees Fahrenheit, pursuant to the requirements of Section 350.690(j).

B) The air-conditioning system shall be capable of maintaining an ambient air temperature of between 75 degrees Fahrenheit and 80 degrees Fahrenheit, pursuant to the requirements of Section 350.690(j).

2) All ventilation supply, return, and exhaust systems shall be mechanically operated.

3) Outdoor air intakes shall be located as far as practical, but not less than l5 feet, from the exhaust outlets of ventilation systems, combustion equipment stacks, plumbing vent stacks, or areas that may collect vehicular exhaust and other noxious fumes, including the exhaust stream from fuel-fired heating, ventilating and air conditioning (HVAC) sections. The bottom of outdoor air intakes serving central systems shall be located as high as practical, but not less than six feet above ground level, or, if installed above the roof, three feet above roof level. For fuel-fired heating sections of rooftop HVAC units, the exhaust vent may discharge not less than 36 inches above the highest point of the fresh air intake hood in lieu of the 15 foot separation.

4) The ventilation systems shall be designed and balanced to provide the pressure relationships and ventilation rates as shown in Table B.

5) A differential pressure measuring device shall be installed across each filter bed serving a central air system. The device may be a remote readout instrument if the remote readout is readily visible in a location accessible to the maintenance staff, or if the readout is displayed on an interactive screen.

6) Air conditioning and ventilating systems shall be designed, installed, and maintained as required by NFPA 90A. For areas within the footprint of the facility that are heated by fuel-fired appliances using an air-to-air heat exchanger, no fewer than two carbon monoxide (CO) detectors shall be installed in the area served by each heat exchanger. One CO detector shall be installed within five feet of a supply duct and one within five feet of a return or exhaust duct. CO detectors shall be line or system powered and shall signal the building fire alarm system when activated. If detectors are line powered, a battery back-up or connection to the emergency power system is required.

7) The hood and duct system for cooking equipment used in processes that produce smoke or grease-laden vapors shall comply with NFPA 96. The hood's extinguishment system shall be connected to the building fire alarm system and shall initiate a general alarm when activated. Duct insulation that is used in lieu of spacing from combustible construction members shall terminate at the top of the hood on the lower end, covering the duct collar, and shall pass through any combustible nailer opening in the roof/ceiling assembly and into the roof jack assembly. The material used shall be installed exactly as the manufacturer's installations require.

8) Boiler rooms and other rooms having combustion equipment shall be provided with sufficient outdoor air to maintain combustion rates of equipment and limit temperatures to 20 degrees Fahrenheit over ambient inside air in adjacent interior spaces. If sealed combustion units are in use, the discharge line shall remain clear of any adjacent walk paths and shall be not less than 15 feet from any operable fenestration or air intakes. NFPA 54 shall apply, including the calculations for combustion air openings. Effective temperature shall be as defined by the American Society of Heating, Refrigerating, and Air Conditioning Engineers Handbook of Fundamentals.

9) Rooms containing heat-producing equipment, such as boiler rooms, heater rooms, food preparation centers, laundries, and sterilizer rooms, shall be insulated and ventilated to prevent any floor surface above from exceeding a temperature of 10 degrees Fahrenheit above the ambient room temperature. The ventilation rates shown in Table B shall be considered as minimum acceptable rates and shall not be construed as precluding the use of higher ventilation rates.

10) Access for filter changing shall be provided within equipment rooms.

(Source: Amended at 35 Ill. Reg. 3461, effective February 14, 2011)