

CHAPTER 4

VENTILATION AIR SUPPLY

401.0 General.

This chapter contains requirements for ventilation air supply and exhaust, evaporative cooling systems and makeup-air requirements for direct-gas-fired heaters, industrial air heaters, and miscellaneous heaters. [OSHPD 1, 2, 3 & 4] See Sections 404.0 through 418.0. [SFM] Air filters shall comply with all requirements of Part 12, Title 24, Chapter 12-71, SFM Standard 12-71-1.

402.0 Ventilation Air. [Not permitted for OSHPD 1, 2, 3 & 4]

402.1 General Requirements. [Not permitted for OSHPD 1, 2, 3 & 4] All rooms and occupied spaces listed in Table 4-1 shall be designed to have ventilation (outdoor) air for occupants in accordance with this chapter. Ventilation air supply requirements for occupancies regulated by the California Energy Commission are found in the California Energy Code.

402.1.1 Construction Documents. The outdoor air ventilation rate and air distribution assumptions made in the design of the ventilation system shall be clearly identified on the construction documents.

402.2 Natural Ventilation. Use of natural ventilation systems designed in accordance with this section shall be permitted in lieu of or in conjunction with mechanical ventilation systems. [ASHRAE 62.1:5.1]

Exception: An engineered natural ventilation system when approved by the Authority Having Jurisdiction need not meet the requirements of 402.2.1 and 402.2.2. [ASHRAE 62.1:5.1]

402.2.1 Location and Size of Openings. Naturally ventilated spaces shall be permanently open to and within twenty-five (25) feet (8 m) of operable wall or roof openings to the outdoors, the openable area of which is a minimum of 4 percent of the net occupiable floor area. Where the openings are covered with louvers or otherwise obstructed, openable area shall be based on the free unobstructed area through the opening. Where interior spaces without direct openings to the outdoors are ventilated through adjoining rooms, the opening between rooms shall be permanently unobstructed and have a free area of not less than 8 percent of the area of the interior room nor less than 25 ft² (2.3 m²). [ASHRAE 62.1:5.1.1]

402.2.2 Control and Accessibility. The means to open required operable openings shall be readily accessible to building occupants whenever the space is occupied. [ASHRAE 62.1:5.1.2]

402.3 Mechanical Ventilation. Where natural ventilation is not permitted by this section or the Building Code, mechanical ventilation systems shall be designed, constructed, and installed to provide a method of supply air and exhaust air. The system shall operate so that all rooms and spaces are continuously provided with the required ventilation rate while occupied.

403.0 Ventilation Rates. The design outdoor air intake flow rate for a ventilation system shall be determined in accordance with Sections 403.1 through 403.6.

403.1 Zone Calculations. Zone parameters shall be determined in accordance with Sections 403.1.1 through 403.1.3. [ASHRAE 62.1:6.2.2]

403.1.1 Breathing Zone Outdoor Airflow. The design outdoor airflow required in the breathing zone of the occupiable space or spaces in a zone, i.e., the breathing zone outdoor airflow (V_{bz}), shall be determined in accordance with Equation 4-1. [ASHRAE 62.1:6.2.2.1]

$$V_{bz} = R_p P_z + R_a A_z \quad (\text{Equation 4-1})$$

Where:

A_z = zone floor area: the net occupiable floor area of the zone ft.² (m²).

P_z = zone population: The largest number of people expected to occupy the zone during typical usage. If the number of people expected to occupy the zone fluctuates, P_z shall be permitted to be estimated based on averaging approaches described in Section 403.4. If P_z cannot be accurately predicted during design, it shall be estimated based on the zone floor area and the default occupant density listed in Table 4-1.

R_p = outdoor airflow rate required per person as determined from Table 4-1.

R_a = outdoor airflow rate required per unit area as determined from Table 4-1. [ASHRAE 62.1:6.2.2.1]

403.1.2 Zone Air Distribution Effectiveness. The zone air distribution effectiveness (E_z) shall be determined using Table 4-2. [ASHRAE 62.1:6.2.2.2]

403.1.3 Zone Outdoor Airflow. The design zone outdoor airflow (V_{oz}), i.e., the outdoor airflow that