

## **TITLE 24 VENTILATION REQUIREMENTS FOR NON-RESIDENTIAL OCCUPIED SPACES**

Title 24 of the California Code of Regulations, Section 121(a)1 states that: "Within a building all enclosed spaces that are normally used by humans must be continuously ventilated during occupied hours with outdoor air using either natural or mechanical ventilation." Minimum required ventilation rate of outside air is 15 cfm per occupant. This equates to approximately 400 cubic feet per minute (cfm) for an average classroom with 26 occupants.

(Title 24 of CCR, Section 121(b)2 and (d)) Natural Ventilation – Natural outdoor ventilation may be provided for spaces where all areas of the space are within 20 feet of an operable wall or roof opening through which outdoor air can flow provided: The sum of the areas of the openings must total at least 5 percent of the floor area of each space that is naturally ventilated. The openings must also be readily accessible to the occupants of the space at all times. Airflow through the openings must come directly from the outdoors; air may not flow through any intermediate spaces such as other occupied spaces, unconditioned spaces, corridors, or atriums. High windows or operable skylights should be accessible from the floor.

(Title 24 of CCR, Section 121(b)1) Pre-occupancy – Buildings having a scheduled operation must be purged for 1 hour at the minimum required ventilation rate before occupancy.

(Title 24 of CCR, Section 121(c)) Fan Cycling – The ventilation fan may be turned off for a maximum of 5 minutes/hour. In this case, the ventilation rate during the time the system is ventilating must be increased so the average rate over the hour is equal to the required rate.

(Title 24 of CCR, Section 121(c) exception 2) Demand Control Ventilation – The outdoor ventilation rate may be reduced by a demand control ventilation device provided: The device is certified by the Energy Commission; and If the device is a CO<sub>2</sub> sensor, it limits the CO<sub>2</sub> level to no more than 800 parts per million (ppm) while the space is occupied; and ü The sensor for the device is located either in the space or in the return air from the space, with no less than one sensor for every 25,000 square feet of habitable space, or no more space than is recommended by the manufacturer, whichever is less. The controls must not allow the effective ventilation rate to drop below 0.15 cfm per square foot. This equates to approximately 144 cfm for an average classroom of 960 square feet.

(Title 24 of CCR, Section 121(c)) These requirements are for all new buildings or spaces within existing buildings that have undergone a replacement of the HVAC equipment. The requirement for continuous ventilation was established in 1996. There is no current requirement for continuous The above requirements have been verified with Ken Kuphaldt of Lencioni Associates, Mechanical Engineers.