PROTECTING INDOOR WORKPLACES FROM WILDFIRE SMOKE

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Cal/OSHA Guidance on Protecting Indoor Workplaces from Wildfire Smoke (Updated September 2024)

Wildfire smoke can be carried by the wind and become a hazard for employees in indoor workplaces, even those located many miles from evacuation zones. Employers should reduce employee exposure to wildfire smoke by taking appropriate steps, such as ensuring ventilation systems are properly maintained and functioning. Employers should usually avoid eliminating or substantially reducing the outdoor air supply in office buildings and other indoor workplaces. This differs from advice given to the public by environmental and public health agencies during wildfire smoke events. The public is encouraged to set home air conditioners to 'recirculation mode' if possible, to reduce pollutant intake.

Ventilation systems in office commercial buildings are more complex than home air-conditioning systems. Changing the outdoor air supply in commercial buildings can adversely affect other essential functions. These buildings typically have heating, ventilating and air conditioning (HVAC) systems. that bring outside air into the building through filters, blend it recirculated indoor air, and heat or cool the air before distributing it throughout the building. Office and commercial buildings also have air vented out for restrooms and kitchens, and may have local exhaust systems for garages, laboratory fume hoods, or other operations. To function properly, exhaust systems for garages laboratory fume hoods, pr other operations. To function properly, exhaust systems require outdoor air. In addition, without an adequate supply of outdoor air, these systems may create negative pressure in the building. This negative pressure will increase the movement of unfiltered air into the building through openings such as plumbing and sewer vents, doors, windows, seams between building surfaces, or cracks. In general, buildings should be operated at slight positive pressure to keep contaminants out and allow exhaust air systems to function properly. Other undesirable consequences of reducing outdoor air include the buildup of common indoor pollutants such as carbon dioxide and odors, and increases in temperature and humidity.

Cal/OSHA regulations (Title 8, CCR Section 5142) require that HVAC systems be operated continuously while occupied to provide the minimum quantity of outdoor air required by the state building code at the time the building permit was issued. For most buildings, this quantity is the greater of:

- 15 cubic feet per minute (cfm) per person (it may be less in older buildings),
- 0.15 cfm per square foot of conditioned floor space, or
- The amount of air necessary to make up the air exhausted by exhaust ventilation systems in the building (such as restrooms, kitchen, or local exhaust systems).

Using the HVAC System to Protect Building Occupants from Smoke

As a first step to protect building occupants from outdoor air pollution, including hazardous conditions resulting from wildfire smoke, building managers and employers should ensure that the HVAC system filters are not dirty, damaged, dislodged, or leaking around the edges. Before wildfire season or during smoke events, if necessary, employers and building operators should ensure that a qualified technician inspects the HVAC system, makes necessary repairs, and conducts appropriate maintenance. Filters should fit snugly in their frames and have gaskets or sealants on all perimeter edges to ensure that air does not leak around the filters.

Building operators should consider installing the highest efficiency filters that do not exceed the static pressure limits of the HVAC system, as specified by the manufacturer or system designer. Pressure gauges should be installed across the filter to indicate when the filter needs replacing, especially in very smoky or dusty areas. Indoor contaminants can be further reduced by using stand-alone High Efficiency Particulate Air (HEPA) filtering units. For more information on air cleaners, see the California Air Resources Board webpage at: http://www.arb.ca.gov/research/indoor/particles.htm.

Cal/OSHA recognizes that in some circumstances it may be helpful to reduce the amount of outdoor air in order to reduce smoke pollution inside the building, while still maintaining positive pressure in the building. Therefore, Cal/OSHA will not issue citations during smoke events for temporary reductions in outdoor air flow rates that are below the requirements of T8CCR5142 when all of the following conditions are met:

- The local outdoor air quality for particulate matter meets the Environmental Protection Agency (EPA) Air Quality Index definition of Unhealthy, Very Unhealthy, or Hazardous due to wildfire smoke.
- A qualified HVAC technician has inspected the HVAC system and ensured that the filters are functioning properly, that the filter bank is in good repair, and that the highest feasible level of filtration has been provided. This must be documented in writing.
- A qualified HVAC technician or engineer has assessed the building mechanical systems and determined, in writing, the amount of outside air necessary to prevent negative pressurization of the building, and to sufficiently ventilate any hazardous processes in the building (such as enclosed parking garages or laboratory operations).
- The HVAC system is operated continuously while the building is occupied to provide at least the minimum quantity of outdoor air needed, as determined by the HVAC technician or engineer in Item 3 above.
- The employer or building operator ensures that the system is restored to maintain the outdoor air supply levels required by Section 5142 no later than 48 hours after the particulate matter levels fall below the levels designated by the EPA as Unhealthy.

Other Actions to Protect Employees from Wildfire Smoke

In addition to assessing and, if necessary, modifying the function of the HVAC system, employers are encouraged to take other reasonable steps to reduce employee exposure to smoke, including alternate work assignments, relocation, and telecommuting. Some buildings rely on open windows, doors, and vents for outdoor air, and some may have mechanical ventilation systems that lack a functioning filtration system to remove airborne particles. In these cases, Section 5141.1 may be applicable unless the employer can demonstrate indoor air quality to be less than a current AQI for PM2.5 of 151. Employees may need to be relocated to a safer location depending on factors such as the level of outdoor smoke and the local air quality index. Employees with asthma, other respiratory diseases, or cardiovascular diseases should be advised to consult their physician for appropriate measures to minimize health risks.

Respirators may provide additional protection to some employees against wildfire smoke hazards. Employees whose work assignments require respirators must be included in a respiratory protection program that includes training, medical evaluations, and fit-testing. However, employers may provide filtering facepiece respirators (disposable dust masks) to employees who voluntarily choose to use them to protect themselves against smoke hazards. If the use of the mask is voluntary, employes are not required to provide a medical evaluation or fit-test. Employers must inform these employees that the respirator will provide some protection against the particles in smoke but will not provide complete protection. A respirator that has not been fit-tested does not provide the maximum level of protection. Employees should be informed that the respirators marked N95, N-99, N-100, R-95, P-95, P-99, or P-100 do not protect against gases or vapors. Although a medical evaluation is not required, employees are advised to consult their doctor about potential exposures to smoke and respirator use, particularly if they have certain health problems such as respiratory or heart conditions. Employers must also provide employees with the information in California Code of Regulations, title 8, section 5144, Appendix D *Information for Employees Using Respirators When Not Required under the Standard.* The California Department of Public Health has prepared a fact sheet on the use of N95 respirators called "Protect Your Lungs From Wildfire Smoke," which can be found at: http://bepreparedcalifornia.ca.gov/epo/.

Additional Information

The Lawrence Berkeley National Laboratory has produced a multi-page summary of research results on the effectiveness, cost, and health benefits of air filtration.