



Protect Yourself and your Employees from Wildfire Smoke

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Despite the news media....the entire state is not on fire. Though depending on where you live and the wind direction on any given day....it may seem like it. However, when smoke does fill the air, you may wonder if the smoke is a health hazard and if there is anything you can do to protect yourself and your workers.

Smoke is a complex mixture of gases and fine particles. The fine particles in smoke are the primary health concern. Irritating chemicals in the smoke, such as formaldehyde and acrolein, can contribute to the irritating effects of the particulate matter. Carbon monoxide is also produced by wildfires, with the highest levels found in close proximity to a smoldering fire. However, the level of carbon monoxide the general population is exposed to from a wildfire typically is not a hazard.

Health effects depend upon the level of smoke exposure and the susceptibility of the individual. People with asthma, lung disease, or heart disease are more likely to be affected by smoke. Symptoms can include irritation of the eyes and respiratory tract, cough, phlegm, wheezing, or difficulty in breathing. Individuals with cardiovascular disease may experience chest pain or arrhythmias. Exposure to smoke may also depress the lung's ability to fight infection. The risk of cancer or other long-term health effects from short-term exposure to smoke, however, is considered to be quite low.

Employers should stay alert. They should listen to local news, weather forecasts, and air quality alerts. Air quality advisories and news can also be found at www.airnow.gov. Air quality districts rate the air as good, moderate, unhealthy for sensitive groups, unhealthy, very unhealthy, or hazardous. Depending upon the conditions, recommendations may be made that apply to sensitive groups or to everyone. These recommendations are geared towards the general public, so employers should be sure to use appropriate judgment when applying them to the workplace.

Staying indoors is a common advisory. The doors and windows should be kept shut if possible. Building managers and employers should ensure that the heating, ventilation, and air-conditioning (HVAC) system filters are not dirty, damaged, dislodged, or leaking around the edges. Building operators should consider installing the highest efficiency filters that do not exceed the static pressure limits of the HVAC system. In some circumstances, it may be helpful to reduce the amount of outdoor air while still maintaining positive pressure in the building and sufficiently ventilating any hazardous processes in the building. Before reducing the amount of outdoor air, employers and building owners should refer to the Cal/OSHA guidance document on wildfires at www.dir.ca.gov/DOSH.

Sometimes the air inside is as bad as the air outside. This may be from inadequate filtration, the need to open doors and windows, or infiltration of unfiltered air into a "leaky" building. Whatever the reason, if the air inside is unhealthy, it may be appropriate for some or all employees to relocate to a safer location. Telecommuting may be an option.

Portable room air cleaners can supplement the filtering of particulates done by an HVAC system. The effectiveness of an air cleaning device is a function of the cleaning efficiency, the air exchange rate, and the room size. Some air cleaners are mechanical: the air is pulled through a filter that traps particles. Other air cleaners are electronic; these include electrostatic precipitators and ionizers. The electronic devices produce some amount of ozone (a respiratory irritant) as a result of the ion-generating technology used. Some “air purifiers” or ozone generators are specifically designed to generate ozone and should not be used. The Cal/EPA Air Resources Board has more information on air cleaners at www.arb.ca.gov/research/indoor/acdsumm.pdf.

Heat stress may become a health issue if the windows and doors are kept shut, but the building has no air conditioning. If remaining in the workplace means choosing between heat stress and smoke exposure, it may be appropriate for some or all employees to relocate to a safer location.

Air contaminants generated within the workplace can be a concern. Some workplaces rely on open doors and windows to control exposures to air contaminants from forklifts, welding, or other operations. Similarly, the make-up air for a local exhaust ventilation system may bring in unfiltered, smoke-filled air from outside. To protect workers from exposure to wildfire smoke and airborne contaminants generated within the workplace, it may be best to limit or even stop some operations.

Reducing physical activity is also recommended when air quality is unhealthy. With increased physical activity, breathing rate increases and so does the amount of pollutants inhaled. With heavy exertion, workers also tend to breathe more deeply, depositing particles deeper into the lungs. Heavy exertion may also cause workers to breathe through their mouths, bypassing the filtering mechanisms of the nose. Employers should review the level of physical exertion needed for all operations and limit or stop some activities if appropriate.

Using N95 or P100 filtering facepiece respirators may provide protection against the particulates in wildfire smoke. Mandatory use of these respirators in the workplace requires a written respiratory protection program that includes fit-testing and medical evaluations, along with other requirements. If, however, the employer provides these respirators for voluntary use, no respiratory protection program is required. The employer must, however, provide a copy of Appendix D of the Cal/OSHA respiratory protection standard, available at www.dir.ca.gov/Title8/5144d.html.

It is important to note that filtering facepieces do not provide protection against the gases and vapors in smoke. Also, the respirator must seal properly around the face to be effective. Because the air resistance of these respirators may make breathing more difficult, voluntary users may want to consult with their physician, especially if they have respiratory or heart conditions. Be sure that the respirator is approved by the National Institute for Occupational Safety and Health (NIOSH). Surgical masks and one-strap paper masks are not respirators and are not designed to protect the lungs. For more information, the California Department of Public Health has a fact sheet, *Protect Your Lungs from Wildfire Smoke*, available

at <http://www.bepreparedcalifornia.ca.gov/Documents/Protect%20Your%20Lungs%20Respirator.pdf>. In addition, consult the Cal/OSHA guidance document on wildfires.

Consider the commute. Even if the air where the workplace is located is relatively unaffected by wildfires, employees may need to travel on roads with unhealthy levels of smoke or where reduced visibility makes driving dangerous. Employers should also be on the alert for road closures and notify employees if their commute home is affected.

After a fire, housekeeping can help reduce the indoor levels of particulate matter present in the air and on surfaces. Over time, airborne particulate levels will decrease, but there are some things that can be done to maximize the comfort and health of employees. Housekeeping staff should be instructed to only use HEPA (high efficiency particulate air) vacuum cleaners so that fine particles are not reintroduced into the air. Carpets, upholstery, and other porous materials should be thoroughly HEPA vacuumed or professionally cleaned. Nonporous surfaces, including walls and floors, should be cleaned using wet methods where feasible.