

# Guidelines for IAQ and HVAC System Protection during Wild Fire Response

In addition to the fine particulates and ash directly produced by fires, strong updrafts pull additional material into the atmosphere. HVAC system integrity can be protected during and after the event with proactive response.

## Wildfire Associated Airborne Particulates

### Larger particles:

- Soot, ash, etc.
- Deteriorate Air Quality
- Can be effectively filtered with proactive preparation

### Carbon particles:

- Fine particles generated by wildfires
- Very oily and can release strong odors
- Will stick to duct and air handler surfaces
- Highly likely to contaminate any portion of the HVAC system without HEPA filtration
- Patient outcomes may be affected due to impact on breathing
- Cause extreme irritation
- Hyperallogenic
- Can cause severe headaches
- Can flow into the lungs and worsen symptoms of asthma, bronchitis and emphysema

### Mold Spores:

- Are captured by updrafts around fires
- Airborne counts rise significantly
- Highly likely to contaminate any portion of the HVAC system without HEPA filtration
- May cause interstitial space contamination if spores contact water leakage
- Pose serious health risk
- Know source of HAIs
- Allogenic
- Deteriorate Air Quality

## Cal/OSHA interim Guidance on Protecting Workers in Offices and Similar Indoor Workplaces from Wildfire Smoke

Abridged Excerpts from *Wildfire Smoke A Guide for Public Health Officials* Revised July 2008: see complete text at <http://www.cdc.gov/nceh/airpollution/airquality/>

### Cal/OSHA

Does not generally recommend eliminating or substantially reducing outdoor air supply as a first step to reduce exposure to smoke. Some exhaust systems may require makeup air to function properly. Also, without an adequate supply of outdoor air these systems may create negative pressure, increasing the flow of unfiltered air into the building through any openings.

Regulations (8 CCR 5142) require HVAC systems to be operated continuously while occupied.

Recognizes that in some circumstances it may be helpful to reduce outdoor air supply 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 airflow rates violating the requirements of 8 CCR 5142 when:

- Outdoor Air Quality meets EPA Air Quality Index of unhealthy or above
- A qualified HVAC technician has inspected the HVAC system for proper functioning and highest level of possible filtration (must be documented)
- A qualified HVAC technician or engineer has assessed the building mechanical system and determined the necessary makeup air required to maintain positive pressure in the building and ventilate hazardous processes
- The HVAC system is operated continuously while occupied to provide at least the minimum required makeup air as previously established
- The system is restored to normal operation no later than 48 hours after outdoor air quality falls below the EPA designated unhealthy level

### Other Actions

Any reasonable steps to reduce employee exposure to smoke  
In this situation: employees whose work assignment does not require filtering face piece respirators (N95) and voluntarily choose to use them are not required to provide a medical evaluation or fit-test

## Plan Ahead

If your facility is in a fire prone area put together a plan, inspect systems and stockpile equipment. Mintie can supply filters, machinery and in many areas HVAC services.



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# Prevent Smoke / Particulate Penetration

## Fire Response Recommendations

Add pre-filters to outside air intakes of air handlers. Poly Tacky Media Pad filters are an easy option for extra short term filtration. Static Pressure Reserve in system must be enough support extra draw.

Check intake filters often: Increased counts of airborne particulates may require more frequent replacement.

Slow variable speed exhaust fans to reduce airflow. This will increase overall positive pressure, minimizing external air penetration at doors, windows, leaks, etc.

Set up an ECU2 with Corridor Flange and Negative Air Machines to prevent smoke from entering at main doors.

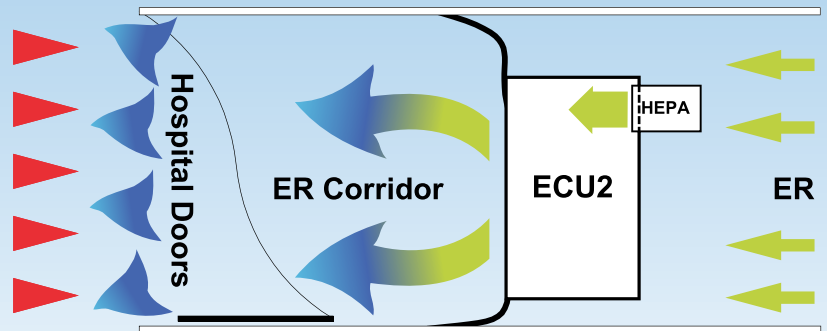
Use HEPA filtered Negative Air Machines for spot area protection.

## Not Recommended

Testing air quality. Issues are known, quantifying is unnecessary

Turning off HVAC or excluding makeup (outdoor) air to stop intrusion of contaminated air. Excess carbon dioxide contamination from occupants results in headaches, and nausea. Makeup air is also necessary to maintain positive pressure.

Carbon filters are a possibility if the air conditioning systems have sufficient static pressure reserve. But generally, by the time retrofit installation is completed, the fires will be out. Carbon filters will only reduce odor perceptions by about 75 - 80%.



An ECU2 with Corridor Flange and Negative Air Machines (stacked) can be used to increase positive pressure just inside main hospital doors. This prevents smoke and other particulates (red arrows) from entering the hospital while the doors are open.

## Contaminants Penetrating HVAC system Will Persist/Grow Until Treated

### Post-Fire Recommendations

Do not allow contaminants to continue posing health and irritation risk or give organic elements a chance to spread.

Set up a first phase cleaning plan as quickly as possible.

Use spot cleaning to minimize potential interstitial space contamination.

Clean/Sanitize HVAC System using a company familiar with best practices for fire generated particulates. These differ from standard techniques.