



Department of Consumer
and Business Services

Hazard alert

Wildland firefighting respiratory protection

Fighting wildland fires can expose firefighters to harmful components contained in smoke, which in part include:

- Acrolein and formaldehyde – these are both highly irritating to the mucous membranes.
- Carbon monoxide – inhaling high levels may cause breathing problems, collapse, coma, or death.
- Airborne particulates – fine particulate matter with an aerodynamic diameter of 2.5 micrometers, or smaller, aka PM2.5, can cause respiratory and other health issues. PM2.5 can cause mild symptoms such as coughing, runny nose, eye irritation, and sore throat. It can also cause serious and sometimes fatal effects such as trouble breathing, asthma attacks, chest pain, and heart failure.

Voluntary respiratory protection

Wildland firefighters and workers engaged in supporting a fire response or working at the fire base camp must be provided NIOSH-approved filtering facepiece respirators (such as N95s, P100s, etc.) for voluntary use when exposed to an ambient air concentration for PM2.5 of 35.5 µg/m³ (AQI 101) or higher. Filtering facepiece respirators may be distributed directly to each exposed employee, or can be maintained in sufficient supplies that are readily accessible and known to exposed employees.

Are wildfire firefighting masks that are not NIOSH-approved considered respirators?

No, non-NIOSH-approved wildland firefighter face masks offer little protection against the harmful components contained in smoke, and they do not protect against superheated gases or supply oxygen.

Are there NIOSH-approved wildland firefighting face masks that are acceptable to Oregon OSHA?

No, NIOSH only approves respirators. The only NIOSH-approved respirator to protect against smoke inhalation is a self-contained breathing apparatus that may not be practical to use under typical wildland fire conditions.



NIOSH-approved filtering facepiece respirators such as N95, P95, R95, N99, P99, N100, and P100 can significantly reduce workers' exposure to PM_{2.5} when used effectively; however, they DO NOT protect the wearer from carbon monoxide and other toxic pollutants.

Do bandanas provide protection?

No, smoke particles, gases, and vapors can easily pass through dry or wet bandanas.

Can firefighters use NIOSH-approved filtering facepiece respirators or face masks when fighting wildfires?

Yes, they can be used on a voluntary basis as long as other precautions are taken to keep the exposures to harmful components contained in smoke below applicable Oregon OSHA permissible exposure limits. NIOSH-approved filtering facepiece respirators must be provided by the fire management team or employer when the ambient air concentration for PM_{2.5} is at or above 35.5 µg/m³ (AQI 101).

What are common situations that may increase exposure to firefighters using the NIOSH-approved filtering facepiece respirators or wildland firefighting face mask?

- **Dense smoke:** Firefighters may have a false sense of protection in dense smoke longer if the NIOSH-approved filtering facepiece respirator or wildland firefighter face mask gives the impression that smoke inhalation has been reduced. This may lead to longer exposures to higher concentrations of unfiltered smoke components. When firefighters assume they are protected from smoke, they may take unnecessary risks.
- **High carbon monoxide levels:** Filtering facepiece respirators such as N95, P95, R95, N99, P99, N100, and P100 do not protect against gases. Using a NIOSH-approved filtering facepiece respirator or

wildland firefighter face mask during the mop-up stage can be hazardous because carbon monoxide levels can be higher during that phase of a fire.

- **Strenuous activities:** During a strenuous effort, the increased breathing resistance from the filtering facepiece respirator or mask and heat stress can cause a sense of breathlessness and claustrophobia.

What can employers do to improve firefighter safety?

Management strategies

- Involve firefighters, supervisors, and managers in developing a smoke exposure management strategy for the situation at hand.
- Limit wildland firefighter exposure to smoke when possible.
- Direct work upwind from smoke, whenever possible.
- Locate camps and incident command posts in areas that are upwind of the fire and are not prone to inversions.
- Assign work and provide breaks in areas of reduced smoke whenever possible.
- Provide NIOSH-approved filtering facepiece respirators for voluntary use to exposed workers.
- Provide wildfire smoke training annually, before employees are exposed, in a language and vocabulary readily understood, and in a manner that facilitates employee feedback.

Provide and document employee training:

Training must include:

- A. The symptoms of wildfire smoke exposure, including:
 - Eyes: burning sensations, redness, and tearing caused by irritation and inflammation that can temporarily impair vision

- Respiratory system: runny nose, sore throat, cough, difficulty breathing, sinus irritation, wheezing, and shortness of breath
 - Fatigue, headache, irregular heartbeat, and chest pain
- B.** The potential acute and chronic health effects from wildfire smoke exposure, including increased health risks to sensitive groups, and how chronic exposures can increase the risk of cardiovascular disease and can exacerbate asthma.
- C.** Each employee's right to report health issues related to wildfire smoke exposure and obtain medical treatment for such workplace exposures without fear of retaliation.
- D.** How employees can obtain the current average and forecasted ambient air concentration for PM2.5 and equivalent AQI value for their work location.
- E.** The importance, limitations, and benefits of using a filtering facepiece respirator, which is provided by the employer at no cost to the employee to reduce exposure to wildfire smoke, and how to use and maintain their filtering facepiece respirator.
- F.** The employer's methods to protect employees from wildfire smoke, including how filtering

facepiece respirators will be provided to employees for voluntary use, and how employees can obtain such respirators before exposure and replace them when needed.

- G.** Review of any job tasks performed by employees in which the use of a filtering facepiece respirator would expose the wearer to a hazard associated with a substantially more serious injury or illness than the potential acute health effects of wildfire smoke exposure.

Monitoring

- Routinely monitor smoke conditions and its effects on firefighters.
- Regularly evaluate firefighters' health risks and work activity.
- Make use of electronic carbon monoxide dosimeters when possible, which can give accurate, instantaneous warnings to firefighters when carbon monoxide levels exceed set limits.

It also is important to comply with fire and prescribed **fire rules in Division 7, Subdivision N** and record firefighters' smoke-related recordable injuries and illnesses.

