



Oregon Administrative Rules
Chapter 437

Division 2

General Occupational Safety and Health

*Protection from Wildfire
Smoke*

Subdivision

Z

Administrative
Order 4-2022



Pursuant to **Oregon Revised Statutes (ORS) 654**, The Oregon Safe Employment Act (OSEAct), the Oregon Department of Consumer and Business Services, Occupational Safety and Health Division (Oregon OSHA), adopted these rules.

The Secretary of State designated Oregon Administrative Rules Chapter 437 as the Oregon Occupational Safety and Health Division Rules. Six subject areas are designated as “Divisions” of these rules.

- **Division 1** Administration of the Oregon Safe Employment Act
- **Division 2** General Occupational Safety and Health Rules
- **Division 3** Construction
- **Division 4** Agriculture
- **Division 5** Maritime Activities
- **Division 7** Forest Activities

Oregon-initiated rules are numbered in a uniform system developed by the Secretary of State. This system does not number the rules in sequence (001, 002, 003, etc.). Omitted numbers may be assigned to new rules at the time of their adoption.

Oregon-initiated rules are arranged in the following codification structure prescribed by the Secretary of State for Oregon Administrative Rules (OAR):

Chapter	Division	Subdivision	Rule	Section	Paragraphs
<i>437</i>	<i>002</i>	<i>N</i>	<i>0221</i>	<i>(1)</i>	<i>(a)(A)(i)(I)</i>

Cite as 437-002-0221(1)(a)

Many of the Oregon OSHA rules are adopted by reference from the Code of Federal Regulations (CFR), and are arranged in the following federal numbering system:

Part	Subpart (Subdivision)	Section	Paragraphs
1910	N	.176	(a)(1)(i)(A)(1)(i)

Cite as 1910.176(a)(1)

The terms “subdivision” and “subpart” are synonymous within OAR 437, Oregon Occupational Safety and Health rules.

These rules are available for viewing in the Office of the Secretary of State, Oregon State Archives Building, Salem, Oregon.

These rules are available in electronic and printable formats at osha.oregon.gov.

Printed copies of these rules are available at:

Department of Consumer & Business Services
Oregon Occupational Safety & Health Division (Oregon OSHA)
350 Winter St. NE
Salem, OR 97301-3882

Or call the Oregon OSHA Resource Library at 503-378-3272.

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437-002-1081 Protection from Wildfire Smoke

Note: Oregon OSHA recognizes that occupational wildfire smoke exposures can occur in particularly dynamic situations. Employers must address such hazards based on the information available to them through the exercise of reasonable diligence.

- (1) **Scope and application.** This standard applies to public and private sector employers whose employees are or will be exposed to wildfire smoke where the ambient air concentration for fine particulate matter (PM_{2.5}) is at or above 35.5 µg/m³ (Air Quality Index value of 101 for PM_{2.5}).
 - (a) The following workplaces and operations are exempt from this standard:
 - (A) Enclosed buildings and structures in which the air is filtered by a mechanical ventilation system and the employer ensures that windows, doors, bays, and other exterior openings are kept closed, except when it is necessary to briefly open doors to enter or exit;
 - (B) Enclosed vehicles in which the air is filtered by a properly maintained cabin air filter system, and when the windows, doors, and other exterior openings are kept closed, except when it is necessary to briefly open doors to enter or exit. Buses, light rails, and other enclosed vehicles used for public transit systems where doors are frequently opened to board and deboard passengers are not included under this exemption;
 - (C) When the employer predetermines that operations will be suspended to prevent employee exposure to wildfire smoke at an ambient air concentration for PM_{2.5} of 35.5 µg/m³ (AQI 101) or higher; and
 - (D) Employees working at home.
 - (b) The following workplaces and operations are only subject to subsections (4)(a) through (4)(g) “information and training,” and subsection (7)(b) “voluntary use of filtering facepiece respirators” under this standard:
 - (A) Wildland firefighting and associated support activities such as fire camp services and fire management;
 - (B) Emergency operations that are directly involved in the protection of life or property, public safety power shutoffs, or restoration of essential services, such as evacuation, rescue, medical, structural firefighting, law enforcement, utilities, and communications; and

- (C) Work activities involving only intermittent employee exposure of less than 15 minutes in an hour to an ambient air concentration for PM_{2.5} at or above 35.5 µg/m³ (AQI 101) for a total exposure of less than one hour in a single 24-hour period.

(2) Definitions.

- (a) **Air Quality Index** – The Air Quality Index (AQI) was developed by the U.S. Environmental Protection Agency (EPA) as an indicator of overall air quality and is based on the five criteria pollutants regulated under the Clean Air Act: ground-level ozone, particulate matter, carbon monoxide, sulfur dioxide, and nitrogen dioxide.
- (b) **NIOSH** – The National Institute for Occupational Safety and Health of the United States Centers for Disease Control and Prevention. NIOSH tests and approves respirators for use in the workplace.
- (c) **PM_{2.5}** – Solid particles and liquid droplets suspended in air, known as fine particulate matter, with an aerodynamic diameter of 2.5 micrometers or smaller and measured in micrograms per cubic meter (µg/m³).
- (d) **Sensitive groups** – Individuals with pre-existing health conditions and those who are sensitive to air pollution who are among those likely to experience health problems from exposure to wildfire smoke. Examples of sensitive groups include: people with lung disease such as asthma or chronic obstructive pulmonary disease (COPD), including bronchitis and emphysema, and those who smoke; people with respiratory infections, such as pneumonia, acute bronchitis, bronchiolitis, cold, flu, or those recovering from severe respiratory illness; people with existing heart or circulatory problems, such as irregular heart beat, congestive heart failure, coronary artery disease, angina, and those who have had a heart attack or stroke; children under 18 years old, and adults over age 65; pregnant women; people with diabetes; and people with other medical or health conditions which can be exacerbated by exposure to wildfire smoke as determined by a physician or other licensed healthcare provider.
- (e) **Wildfire smoke** – Emissions from unplanned fires in wildlands, which may include adjacent developed and cultivated areas to which the fire spreads or from where it originates.
- (f) **Wildlands** – Uncultivated and sparsely populated geographical areas covered primarily by grass, brush, trees, slash, or a combination thereof.

- (3) Exposure assessment. Monitor employee exposure to wildfire smoke when employees are, or are likely to be, exposed to an ambient air concentration for PM_{2.5} at or above 35.5 µg/m³ (AQI 101). This monitoring must be performed at the start of each shift, and as needed, to comply with the applicable requirements of sections (6) and (7) of this standard, by using one or more of the following methods:
- (a) Check the current average and forecasted AQI value for PM_{2.5} from the Oregon Department of Environmental Quality, U.S. EPA AirNow or Interagency Wildland Fire Air Quality Response Program websites, or equivalent source;
 - (b) Check notifications of air quality advisories due to wildfire smoke issued by the Oregon Department of Environmental Quality or local government health agencies;
 - (c) Directly measure workplace ambient air concentration for PM_{2.5} in accordance with the testing device manufacturer's user instructions; or
 - (d) If the employer determines and can demonstrate that none of the methods in subsections (3)(a) through (3)(c) of this standard are available for their work location, the employer can then use the 5-3-1 Visibility Index provided in Appendix B, Table 1 of this standard to estimate the current air concentration for PM_{2.5}, and equivalent AQI value, during daylight hours.
- (4) Information and training. Provide wildfire smoke training to all employees, including new employees, supervisory and non-supervisory employees, who may be exposed to an ambient air concentration for PM_{2.5} at or above 35.5 µg/m³ (AQI 101). The training must be provided annually before employees are exposed in a language and vocabulary readily understood, and in a manner that facilitates employee feedback. The training must include at least the following information:
- (a) The symptoms of wildfire smoke exposure:
 - (A) Eyes: burning sensations, redness, and tearing of the eyes caused by irritation and inflammation of the eyes that can temporarily impair one's vision;
 - (B) Respiratory system: runny nose, sore throat, cough, difficulty breathing, sinus irritation, wheezing, shortness of breath; and
 - (C) Fatigue, headache, irregular heartbeat, chest pain.

- (b) The potential acute and chronic health effects from wildfire smoke exposure, including increased health risks to “sensitive groups” as defined in subsection (2)(d) of this standard, and how chronic exposures can increase the risk of cardiovascular disease and can exacerbate an individual’s 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 PM_{2.5} and equivalent AQI value for their work location;
- (e) The importance, limitations, and benefits of using a filtering facepiece respirator, that 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 as required by section (7) of this standard, including how filtering facepiece respirators are required to be made readily accessible to employees for voluntary use when workplace ambient air concentration for PM_{2.5} is at or above 35.5 µg/m³ (AQI 101), and how employees can obtain such respirators before exposure and replace them when needed;
- (g) Review of any job tasks performed by employees that 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, and must not be used when performing such tasks;
- (h) The procedures supervisors must follow when an employee reports or exhibits health symptoms that necessitate immediate medical attention such as, but not limited to, asthma attacks, difficulty breathing, and chest pain;
- (i) How to operate and interpret exposure results based on any PM_{2.5} monitoring device used by the employer in compliance with this standard; and
- (j) An explanation of the employer's two-way communication system for wildfire smoke exposure control information as required by section (6) of this standard.

- (5) Training documentation. Verify supervisor and employee training required under section (4) of this standard by preparing a written or electronic record that includes at least the name or identification number of each employee trained, the date(s) of the training(s), and the name of the person(s) who conducted the training. The most recent annual training record for each employee must be maintained for one year.
- (6) Employer two-way communication. Before employees are exposed to an ambient air concentration of PM_{2.5} at or above 35.5 µg/m³ (AQI 101), develop and implement a two-way system to communicate wildfire smoke information between supervisors and employees. At a minimum, this communication system must include:
- (a) A means to notify exposed employees of any changes in the air quality at their work location that would necessitate an increase or decrease in the level of exposure controls required in section (7) of this standard; and
 - (b) A means to enable and encourage employees to inform their employer or supervisor of at least the following:
 - (A) Any changes in the air quality at their work location that could necessitate an increase or decrease in the level of exposure controls required by section (7) of this standard;
 - (B) Any availability issues of appropriate exposure control measures required by section (7) of this standard; and
 - (C) Any health symptoms that may be the result of wildfire smoke exposure and that could necessitate medical attention.
- Note:** The employer's emergency medical plan or medical services provisions to comply with Division 2, Subdivision K, OAR 437-002-0161(4); Division 3, Subdivision D, 29 CFR 1926.50; or Division 7, Subdivision C, OAR 437-007-0220; must address the types of medical situations that employees could encounter, including those conditions relating to wildfire smoke exposure.
- (7) Exposure controls.
- (a) Engineering and administrative controls. Implement engineering and administrative controls to reduce employee PM_{2.5} exposure to less than 35.5 µg/m³ (AQI 101), unless the employer can demonstrate that such controls are functionally impossible, or would prevent the completion of work.

- (A) Appropriate engineering controls may include, but are not limited to, temporarily relocating outdoor workers to available indoor areas or vehicles where the air is adequately filtered, or using portable air purifiers equipped with HEPA filters (or similar high-efficiency air filters) that are sufficient in number and performance for the size of the enclosed area where used.
 - (B) Appropriate administrative controls may include, but are not limited to, temporarily relocating outdoor work operations to another outdoor location with better air quality when work permits, and changing employee work schedules to when better air quality is forecasted.
- (b) Voluntary use of filtering facepiece respirators. Whenever employee exposure to PM_{2.5} is at or above 35.5 µg/m³ (AQI 101), even after the implementation of engineering and administrative controls, ensure that appropriate NIOSH-approved filtering facepiece respirators are provided to employees for voluntary use, strictly for protection against wildfire smoke, when such use would not 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. Ensure that such respirators are:
- (A) Provided and replaced as needed at no cost to employees by either:
 - (i) Distributing filtering facepiece respirators directly to each exposed employee; or
 - (ii) Maintaining a sufficient supply of filtering facepiece respirators that is readily accessible and known to any exposed employee at each work location. This respirator supply must be in a location that does not restrict or hinder employee access to respirators or discourage the replacement of a respirator when needed.
 - (B) Stored and maintained so that they do not present a health hazard to the user.

Note: Voluntary use of filtering facepiece respirators under subsection (7)(b) in this standard is not subject to the requirements under the Respiratory Protection Standard – 29 CFR 1910.134.

Note: Employer supplies of NIOSH-approved filtering facepiece respirators for voluntary use should include an adequate size selection for exposed employees.

- (c) Required use of filtering facepiece respirators in accordance with a Wildfire Smoke Respiratory Protection Program. Whenever employee exposure to PM_{2.5} is at or above 200.9 µg/m³ (AQI 251), even after the implementation of engineering and administrative controls, ensure that employees wear appropriate NIOSH-approved filtering facepiece respirators when such use would not 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. When such filtering facepiece respirators are provided and used strictly for protection against wildfire smoke, the employer may implement and follow the Wildfire Smoke Respiratory Protection Program as described in Appendix A of this standard in lieu of conducting medical evaluations and fit testing, which are otherwise required under the Respiratory Protection Standard – 29 CFR 1910.134.
- (d) Required use of respirators in accordance with the Respiratory Protection Standard – 29 CFR 1910.134. Whenever employee exposure to PM_{2.5} is at or above 500.4 µg/m³ (AQI 501), even after the implementation of engineering and administrative controls, ensure that employees wear appropriate NIOSH-approved respirators that protects wearers from PM_{2.5} when such use would not 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. For respirators used exclusively to protect employees from wildfire smoke concentrations of PM_{2.5} at or above 500.4 µg/m³ (AQI 501), develop and implement a complete Respiratory Protection Program in accordance with 29 CFR 1910.134 – Respiratory Protection.

Note: The requirements of subsections (7)(c) and (7)(d) do not apply to occupants of employer-provided housing while they are inside the housing.

Note: Elastomeric respirators are distinct from filtering facepiece respirators. If elastomeric respirators are used to reduce employee exposure to wildfire smoke at any PM_{2.5} concentration, employers must comply with all applicable requirements under of the Respiratory Protection Standard – 29 CFR 1910.134.

Statutory Authority.: ORS 654-025(2), 654.035, and 656.726(4).

Statutes Implemented: ORS 654.001 to 654.295.

History: OSHA Admin. Order 4-2022, filed 5/10/2022, effective 7/1/2022.

Appendix A: Mandatory Workplace Guidance for the Use of Filtering Facepiece Respirators to Address Wildfire Smoke

This appendix applies only to employers covered by this standard that require NIOSH-approved filtering facepiece respirators, including N95, P95, R95, N99, P99, N100 and P100, to be used by their employees strictly for wildfire smoke exposures when the work location ambient air concentrations of PM_{2.5} is at or above 200.9 µg/m³ (AQI 251) and below 500.4 µg/m³ (AQI 501).

Note: Employer supplies of NIOSH-approved filtering facepiece respirators for required use under this standard should include an adequate size selection for exposed employees.

Filtering facepiece respirators are disposable, negative-pressure, air purifying respirators where an integral part of the facepiece or the entire facepiece is made of air contaminant filtering material. This appendix does not apply to other types of respirators, including but not limited to elastomeric tight-fitting respirators, nor does it apply to situations where workers use filtering facepiece respirators for protection against air contaminants other than PM_{2.5} from wildfire smoke.

Employers whose workers are required to wear filtering facepiece respirators to protect against wildfire smoke exposures when workplace ambient air concentrations of PM_{2.5} is at or above 200.9 µg/m³ (AQI 251) must either develop and implement a respiratory protection program in accordance with the Respiratory Protection Standard (29 CFR 1910.134), or a Wildfire Smoke Respiratory Protection Program in accordance with the following requirements when workplace ambient air concentration of PM_{2.5} is under 500.4 µg/m³ (AQI 501):

- (A) Employee training. Employers must ensure that employees wearing filtering facepiece respirators are trained in the proper use of the respirators, including putting them on and removing them, any limitations on their use, how to care for the respirator, and the ability to demonstrate a seal check as described in section (B) of this appendix.
- (B) Filtering facepiece respirator user seal check. Each employee who uses a filtering facepiece respirator must perform a user seal check to ensure a sufficient face fit to maximize effectiveness each time the respirator is put on. Either the positive or negative pressure checks listed in this appendix, or the respirator manufacturer's recommended user seal check method must be used.

1. Instructions for positive pressure user seal check. Once you have properly donned the respirator, place your hands over the facepiece, covering as much surface area as possible. Exhale gently into the facepiece. The face fit is considered sufficient if a slight positive pressure is being built up inside the facepiece without feeling air passing between your face and the facepiece. If the particulate respirator has an exhalation valve, then performing a positive pressure check may not be possible. In such cases, a negative pressure check must be performed.
 2. Instructions for negative pressure user seal check. Negative pressure seal checks are typically conducted on particulate respirators that have exhalation valves. Once you have properly donned the respirator, cover the filter surface with your hands as much as possible and then inhale gently. The face fit is considered sufficient if the facepiece slightly collapses towards your face without feeling air passing between your face and the facepiece.
 3. Correcting problems discovered during the seal check. In the case of either type of seal check (positive or negative), if air leaks around the nose, use both hands to readjust the nosepiece by placing your fingertips at the top of the metal nose clip. Slide your fingertips down both sides of the metal strip to more efficiently mold the nose area to the shape of your nose. Readjust the straps along the sides of your head until a proper seal is achieved.
- (C) Filtering facepiece respirator storage and replacement. Store, maintain, and replace so that they do not present a health hazard to the user.

Appendix B: Information for Wildfire Smoke Protection

Table 1: Air Quality Index (AQI) Values and Equivalent Concentrations for PM2.5, and 5-3-1 Visibility Index Values

AQI Values	PM2.5 Concentration in $\mu\text{g}/\text{m}^3$	Visibility Index Values (How far you can see)
0 - 50	0.0 - 12.0	over 15 miles
51 - 100	12.1 - 35.4	5 - 15 miles
101 - 150	35.5 - 55.4	3 - 5 miles
151 - 200	55.5 - 150.4	1 - 3 miles
201 - 300	150.5 - 250.4	1 mile
301 and higher	250.5 and higher	less than 1 mile

Note: The AQI, as used in this standard, is a recognized proxy to identify worker exposure to PM2.5 for which traditional occupational exposure limits have not been established. The EPA AQI risk category labels were specifically developed to advise the public of the community health risk levels associated with air quality conditions in a general population setting. The AQI calculation allows for a measurement that is easily accessible to both employers and employees.

Note: When estimating the current AQI value by using the 5-3-1 Visibility Index, determine the limit of your visual range by looking for distant targets or familiar landmarks such as mountains, mesas, hills, or buildings at known distances (miles). The visual range is that point at which these targets are no longer visible. Ideally, the viewing of any distance target should be made with the sun behind you. Looking into the sun or at an angle increases the ability of sunlight to reflect off of the smoke, and thus making the visibility estimate less reliable.

Table 2: Protection from Wildfire Smoke Standard Requirements by AQI Value

AQI Value	General Requirements
101 - 250	<ol style="list-style-type: none"> 1. Assess and monitor air quality at each work location where employees are exposed; 2. Provide and document employees training; 3. Implement two-way communication system; 4. Implement engineering and administrative controls; and 5. Provide NIOSH-approved filtering facepiece respirators for voluntary use.
251 - 500	<ol style="list-style-type: none"> 1. 1 through 4 for AQI 101 - 250 above; and 2. Provide NIOSH-approved filtering facepiece respirators for mandatory use by implementing a Wildfire Smoke Respiratory Protection Program in accordance with Appendix A.
501 and above	<ol style="list-style-type: none"> 1. 1 through 4 for AQI 101 - 250 above; and 2. Provide NIOSH-approved respirators for mandatory use by implementing a Respiratory Protection Program in accordance with 29 CFR 1910.134.

See rules for complete requirements.

Historical Notes for Subdivision Z, 437-002-1081

Note:

OSHA Admin. Order 4-2022, filed 5/10/2022, effective 7/1/2022