

REVISION KEY

Black text without underlined highlighting or bolding is the approved emergency regulation that went into effect on July 29, 2019.

**Black bold underlined text** are minor changes that are being considered to make the emergency regulation permanent. If not readopted or made permanent, the emergency regulation will expire on January 28, 2020.

**Red bold underlined text with yellow highlight** are substantive changes that are being considered for later rulemaking. This rulemaking has no specific deadline.

Subchapter 7. General Industry Safety Orders  
Group 16. Control of Hazardous Substances  
Article 107. Dusts, Fumes, Mists, Vapors and Gases

Add new Section 5141.1 to read:

§5141.1. Protection from Wildfire Smoke.

(a) Scope.

(1) This section applies to workplaces where:

- (A) The current Air Quality Index (current AQI), for PM2.5 is **100+51** or greater, regardless of the AQI for other pollutants; and
- (B) The employer should reasonably anticipate that employees may be exposed to wildfire smoke.

(2) The following workplaces and operations are exempt from this section:

- (A) Enclosed buildings or structures in which the air is filtered by a mechanical ventilation system and the employer ensures that windows, doors, bays, and other openings are kept closed to minimize contamination by outdoor or unfiltered air.
- (B) Enclosed vehicles in which the air is filtered by a cabin air filter and the employer ensures that windows, doors, and other openings are kept closed to minimize contamination by outdoor or unfiltered air.

**Discuss what minimum MERV filtration should be required for buildings and vehicles**

- (C) The employer demonstrates that the concentration of PM2.5 in the air does not exceed a concentration that corresponds to a current AQI of **100+51** or greater by measuring PM2.5 levels at the worksite in accordance with Appendix A.
- (D) Employees exposed to a current AQI for PM2.5 of **100+51** or greater for a total of one hour or less during a shift.
- (E) Firefighters engaged in wildland firefighting.

**(3) When the AQI is greater than 100 and less than 151, the employer shall comply with subsection (c) and is exempt from subsections (d) through (g). When the AQI is 151 or greater, the employer shall comply with subsections (d) through (g).**

**(4)(3)** For workplaces covered by this section, an employer that complies with this section will be considered compliant with sections 5141 and 5155 for the limited purpose of exposures to a current AQI for PM2.5 of **100+51** or greater from wildfire smoke.

(b) Definitions.

Current Air Quality Index (Current AQI). The method used by the U.S. Environmental Protection Agency (U.S. EPA) to report air quality on a real-time basis. Current AQI is also referred to as the “NowCast,” and represents data collected over time periods of varying length in order to reflect present conditions as accurately as possible.

The current AQI is divided into six categories as shown in the table below, adapted from Table 2 of Title 40 Code of Federal Regulations, Part 58, Appendix G.

Air Quality Index (AQI) Categories for PM2.5	Levels of Health Concern
0 to 50	Good
51 to 100	Moderate
101 to 150	Unhealthy for Sensitive Groups
151 to 200	Unhealthy
201 to 300	Very Unhealthy
301 to 500	Hazardous

NIOSH. The National Institute for Occupational Safety and Health of the U.S. Centers for Disease Control and Prevention. NIOSH tests and approves respirators for use in the workplace.

PM2.5. Solid particles and liquid droplets suspended in air, known as particulate matter, with an aerodynamic diameter of 2.5 micrometers or smaller.

Wildfire Smoke. Emissions from fires in “wildlands,” as defined in Title 8, section 3402, or in adjacent developed areas.

**(c) Where the AQI for PM2.5 is greater than 100 and less than 151, the employer shall:**

**(1) Establish and implement a system for informing employees, as early in the employees’ shift as possible, that the air is unhealthy for sensitive people.**

**(2) Make Appendix B available to employees.**

**(3) Provide respirators to employees upon request. The respirators shall be NIOSH-approved devices that effectively protect the wearers from inhalation of PM2.5, such as N95 filtering facepiece respirators, and shall be cleaned or replaced as appropriate, stored, and maintained so that they do not present a health hazard to users.**

**(d)(e)** Identification of harmful exposures. The employer shall determine employee exposure to PM2.5 for worksites covered by this section ~~at the start of~~ ~~before~~ each shift and periodically thereafter, as needed to protect the health of the employee, by any of the following methods:

- (1) Check AQI forecasts and the current AQI for PM2.5 from any of the following: U.S. EPA AirNow website, U.S. Forest Service Wildland Air Quality Response Program website, California Air Resources Board website, local air pollution control district website, or local air quality management district website; or
- (2) Obtain AQI forecasts and the current AQI for PM2.5 directly from the EPA, California Air Resources Board, local air pollution control district, or local air quality management district by telephone, email, text, or other effective method; or
- (3) Measure PM2.5 levels at the worksite and convert the PM2.5 levels to the corresponding AQI in accordance with Appendix A.

EXCEPTION: Subsection **(d)(e)** does not apply where an employer assumes the current AQI for PM2.5 is greater than **300500** and ~~uses~~ ~~complies with subsection~~ **(g)(f)(4)(B) using** that assumption ~~to comply with subsection (f)(4)(B).~~

**(e)(4)** Communication. As required by section 3203, the employer shall establish and implement a system for communicating wildfire smoke hazards in a ~~form language and manner~~ readily understandable by all affected employees, including provisions designed to encourage employees to inform the employer of wildfire smoke hazards at the worksite without fear of reprisal. The system shall include effective procedures for:

- (1) Informing employees of:
  - (A) The current AQI for PM2.5 as identified in subsection **(d)(e)**; and
  - (B) Protective measures available to employees to reduce their wildfire smoke exposures; ~~and~~
  - (C) The right to obtain medical treatment without fear of reprisal.**
- (2) Encouraging employees to inform the employer ~~of~~ ~~if any of the following occurs~~:
  - (A) Worsening air quality; ~~and~~
  - (B) Any adverse symptoms that may be the result of wildfire smoke exposure such as asthma attacks, difficulty breathing, and chest pain.

**(f)(e)** Training and instruction. As required by section 3203, the employer shall provide employees with effective training and instruction **in a language easily understood by employees.** At a minimum, this shall contain the information in Appendix B.

**(g)(f)** Control of harmful exposures to employees.

- (1) In emergencies, including rescue and evacuation, subsections **(g)(f)(2)** and **(g)(f)(3)** do not apply, and employers shall comply with subsection **(g)(f)(4)**. Emergencies include utilities,

communications, and medical operations, when such operations are directly aiding firefighting or emergency response.

- (2) Engineering Controls. The employer shall reduce employee exposure to PM<sub>2.5</sub> to less than a current AQI of 151 by engineering controls whenever feasible, for instance by providing enclosed buildings, structures, or vehicles where the air is filtered. If engineering controls are not sufficient to reduce exposure to PM<sub>2.5</sub> to less than a current AQI of 151, then the employer shall reduce employee exposures **as much as to the extent** feasible.
- (3) Administrative Controls. Whenever engineering controls are not feasible or do not reduce employee exposures to PM<sub>2.5</sub> to less than a current AQI of 151, the employer shall implement administrative controls, if practicable, such as relocating work to a location where the current AQI for PM<sub>2.5</sub> is lower, changing work schedules, reducing work intensity, or providing additional rest periods.
- (4) Control by Respiratory Protective Equipment.

- (A) Where the current AQI for PM<sub>2.5</sub> is equal to or greater than 151, but does not exceed **300500**, the employer shall provide **a sufficient number of** respirators to all employees for voluntary use in accordance with section 5144 and encourage employees to use respirators. Respirators shall be NIOSH-approved devices that effectively protect the wearers from inhalation of PM<sub>2.5</sub>, such as N95 filtering facepiece respirators. Respirators shall be cleaned, **or replaced as appropriate**, stored, **and** maintained, ~~and replaced~~ so that they do not present a health hazard to users. Employers shall use Appendix B to this section in lieu of Appendix D to section 5144 for training regarding voluntary use of respirators.

NOTE: For voluntary use of filtering facepieces, such as N95 respirators, ~~some of the requirements of section 5144 do not apply, such as~~ fit testing and medical evaluations **are not required by section 5144.**

- (B) Where the current AQI for PM<sub>2.5</sub> exceeds **300500**, respirator use is required. **Respirators shall be used** in accordance with section 5144. The employer shall provide respirators with an assigned protection factor, as listed in section 5144, such that the PM<sub>2.5</sub> levels inside the respirator correspond to an AQI less than 151.

**EXCEPTION to subsection (g)(4)(B): Respirator use is not required if the employer demonstrates that the employees are exposed to arc flash hazards and that arc-rated face shields, or hoods worn over a respirator, would create a greater hazard to the employee than exposure to PM<sub>2.5</sub> without a respirator.**

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Sections 142.3 and 1446, Labor Code.

Add new Appendix A to new Section 5141.1 to read:

**Appendix A to Section 5141.1. Protection from Wildfire Smoke  
Measuring PM2.5 Levels at the Worksite  
(Mandatory if an Employer Monitors with a Direct Reading Instrument)**

- (a) An employer may use a direct-reading particulate monitor to determine PM2.5 levels for section 5141.1, if the employer can demonstrate that it has complied with this appendix and selected a monitor that:
- (1) Does not underestimate employee exposures to wildfire smoke; or
  - (2) May underestimate wildfire smoke exposures, but the employer has obtained information on the possible error of the monitor from the manufacturer ~~or other published literature~~ and has accounted for the error of the monitor when determining exposures to PM2.5 to ensure that employee exposure levels are not underestimated.
- (b) The monitor shall be designed and manufactured to measure the concentration of airborne particle sizes ranging from an aerodynamic diameter of 0.1 micrometers up to and including 2.5 micrometers. The employer may use a monitor that measures a particle size range beyond these limits, if the employer treats the results as the PM2.5 levels.
- (c) The employer shall ensure that the monitor it uses is calibrated, maintained, and used, including the use of necessary accessories, in accordance with the manufacturer's instructions for accurately measuring PM2.5 concentrations.
- (d) The employer shall use the following table to convert the PM2.5 concentration to the AQI for PM2.5.

<b>PM2.5 in Micrograms per Cubic Meter (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Air Quality Index (AQI) Categories for PM2.5</b>
0 to 12.0	0 to 50
12.1 to 35.4	51 to 100
35.5 to 55.4	101 to 150
55.5 to 150.4	151 to 200
150.5 to 250.4	201 to 300
250.5 to 500.4	301 to 500

- (e) **A qualified person shall conduct and evaluate** ~~The person supervising, directing, or evaluating~~ workplace monitoring for PM2.5 ~~shall have the training or experience necessary to apply this section and~~ to ensure the correct use of the monitor and the interpretation of the results, so that exposures are not underestimated.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Sections 142.3 and 144.6, Labor Code.



Add new Appendix B to new Section 5141.1 to read:

**Appendix B to Section 5141.1. Protection from Wildfire Smoke  
Information to Be Provided to Employees (Mandatory)**

(a) The health effects of wildfire smoke.

Although there are many hazardous chemicals in wildfire smoke, the main harmful pollutant for people who are not very close to the fire is “particulate matter,” the tiny particles suspended in the air.

Particulate matter can irritate the lungs and cause persistent coughing, phlegm, wheezing, or difficulty breathing. Particulate matter can also cause more serious problems, such as reduced lung function, bronchitis, worsening of asthma, heart failure, and early death.

People over 65 and people who already have heart and lung problems are the most likely to suffer from serious health effects.

The smallest—and usually the most harmful—particulate matter is called PM<sub>2.5</sub> because it has a diameter of 2.5 micrometers or smaller.

(b) The right to obtain medical treatment without fear of reprisal.

Employers shall allow employees who show signs of injury or illness due to wildfire smoke exposure to seek medical treatment, and may not punish affected employees for seeking such treatment. Employers shall also have effective provisions made in advance for prompt medical treatment of employees in the event of serious injury or illness caused by wildfire smoke exposure.

(c) How employees can obtain the current Air Quality Index (AQI) for PM<sub>2.5</sub>.

Various government agencies monitor the air at locations throughout California and report the current AQI for those places. The AQI is a measurement of how polluted the air is. An AQI over 100 is unhealthy for sensitive people and an AQI over 150 is unhealthy for everyone.

Although there are AQIs for several pollutants, Title 8, section 5141.1 about wildfire smoke only uses the AQI for PM<sub>2.5</sub>.

The easiest way to find the current and forecasted AQI for PM<sub>2.5</sub> is to go to [www.AirNow.gov](http://www.AirNow.gov) and enter the zip code of the location where you will be working. The current AQI is also available from the U.S. Forest Service at <https://tools.airfire.org/> or a local air district, which can be located at [www.arb.ca.gov/capcoa/dismap.htm](http://www.arb.ca.gov/capcoa/dismap.htm). Employees who do not have access to the internet can contact their employer for the current AQI. The EPA website [www.enviroflash.info](http://www.enviroflash.info) can transmit daily and forecasted AQIs by text or email for particular cities or zip codes.

(d) The requirements in Title 8, section 5141.1 about wildfire smoke.

If employees may be exposed to wildfire smoke, then the employer is required to find out the current AQI applicable to the worksite. **If the current AQI for PM<sub>2.5</sub> is more than 100 and less than 151, the employer is required to:**

**(1) Use a system that informs employees that the air is unhealthy for sensitive people.**

**(2) Make this appendix available to employees.**

**(3) Provide a respirator to those employees who request one.**

If the current AQI for PM2.5 is 151 or more, the employer is required to:

- (1) Check the current AQI **at the start of** ~~before~~ and periodically during each shift.
  - (2) Provide training to employees.
  - (3) Lower employee exposures.
  - (4) Provide respirators and encourage their use.
- (e) The employer's two-way communication system.

Employers shall alert employees when the air quality is harmful and what protective measures are available to employees.

Employers shall encourage employees to inform their employers if they notice the air quality is getting worse, or if they are suffering from any symptoms due to the air quality, without fear of reprisal.

The employer's communication system is: \_\_\_\_\_  
\_\_\_\_\_

- (f) The employer's methods to protect employees from wildfire smoke.

Employers shall take action to protect employees from PM2.5 when the current AQI for PM2.5 is 151 or greater. Examples of protective methods include:

- (1) Locating work in enclosed structures or vehicles where the air is filtered.
- (2) Changing procedures such as moving workers to a place with a lower current AQI for PM2.5.
- (3) Reducing work time in areas with unfiltered air.
- (4) Increasing rest time and frequency, and providing a rest area with filtered air.
- (5) Reducing the physical intensity of the work to help lower the breathing and heart rates.

The employer's control system at this worksite is: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- (g) The importance, limitations, and benefits of using a respirator when exposed to wildfire smoke.

Respirators can be an effective way to protect employee health by reducing exposure to wildfire smoke, when they are properly selected and worn. Respirator use can be beneficial even when the AQI for PM2.5 is less than 151, to provide additional protection.

When the current AQI for PM2.5 is 151 or greater, employers shall provide their workers with proper respirators for voluntary use. If the current AQI is greater than **300500**, respirator use is required.

A respirator should be used properly and kept clean.

The following precautions shall be taken:

- (1) Employers shall select respirators certified for protection against the specific air contaminants at the workplace. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Center for Disease Control and Prevention certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will list what the respirator is designed for (particulates, for example).

Surgical masks or items worn over the nose and mouth such as scarves, T-shirts, and bandannas will not provide protection against wildfire smoke. An N95 filtering facepiece respirator, shown in the image below, is the minimum level of protection for wildfire smoke.

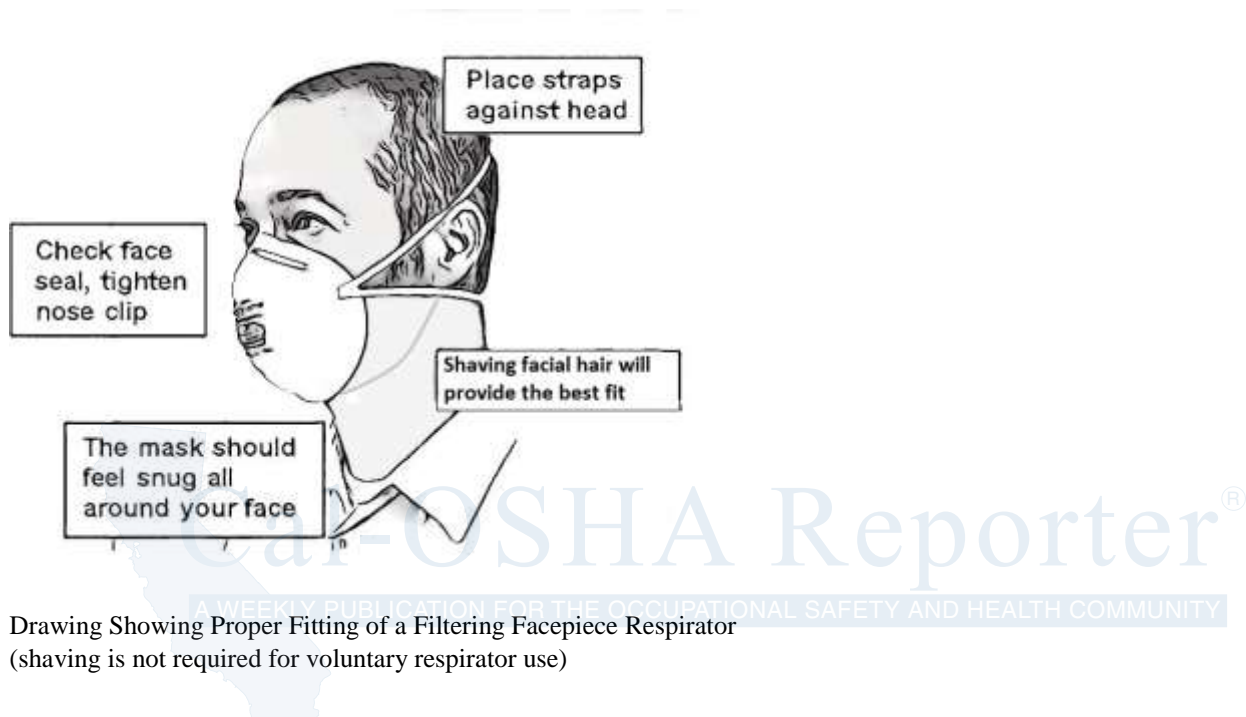
- (2) Read and **follow understand** the manufacturer's instructions on the respirator's use, maintenance, cleaning, and care, along with any warnings regarding the respirator's limitations. The manufacturer's instructions **must be followed except** for medical evaluations, fit testing, and shaving **of facial hair, which are should also be followed, although doing so is recommended but** not required by ~~Title 8, section 5141.1~~ for voluntary use of filtering facepiece respirators.
  - (3) Do not wear respirators in areas where the air contains contaminants for which the respirator is not designed. A respirator designed to filter particles will not protect employees against gases or vapors, and it will not supply oxygen.
  - (4) Employees should keep track of their respirator so that they do not mistakenly use someone else's respirator.
  - (5) Employees who have a heart or lung problem should ask their ~~doctor~~ **health care provider** before using a respirator.
- (h) How to properly put on, use, and maintain the respirators provided by the employer.

To get the most protection from a respirator, there must be a tight seal around the face. A respirator will provide much less protection if facial hair interferes with the seal. Loose-fitting powered air purifying respirators may be worn by people with facial hair since they **often** do not have seals that are affected by facial hair.

The proper way to put on a respirator depends on the type and model of the respirator.

For those who use an N95 or other filtering facepiece respirator mask that is made of filter material:

- (1) Place the mask over the nose and under the chin, with one strap placed below the ears and one strap above.
- (2) Pinch the metal part (if there is one) of the respirator over the top of the nose so it fits securely.



Drawing Showing Proper Fitting of a Filtering Facepiece Respirator  
(shaving is not required for voluntary respirator use)

For a respirator that relies on a tight seal to the face, check how well it seals to the face by following the manufacturer's instructions for user seal checks. Adjust the respirator if air leaks between the seal and the face. The more air leaks under the seal, the less protection the user receives.

Respirator filters should be replaced if they get damaged, deformed, dirty, or difficult to breathe through. Filtering facepiece respirators are disposable respirators that cannot be cleaned or disinfected. A best practice is to replace filtering facepiece respirators at the beginning of each shift.

If you have symptoms such as difficulty breathing, dizziness, or nausea, go to an area with cleaner air **if possible**, take off the respirator, and get medical help.

NOTE: Authority cited: Section 142.3, Labor Code. Reference: Sections 142.3 and 144.6, Labor Code.