

# Wildfire Smoke

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**WAC 296-62-08510 Purpose and scope.**

- (1) This standard applies to workplaces where the employer should reasonably anticipate that employees may be exposed to a NowCast PM<sub>2.5</sub> of 20.5 µg/m<sup>3</sup> (NowCast Air Quality Index 69) or more for wildfire smoke.
- (2) The following workplaces and operations are exempt from this section:
  - (a) Enclosed buildings or structures in which 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 and exit.
  - (b) Enclosed vehicles in which the air is filtered by a properly maintained cabin air filter and the employer ensures that windows, doors, and other openings are kept closed except when it is necessary to briefly open doors to enter or exit.
  - (c) Employees exposed to a NowCast PM<sub>2.5</sub> of less than 250.5 µg/m<sup>3</sup> (NowCast Air Quality Index 301) for a total of one hour or less during a shift.
  - (d) Employees exposed to a NowCast PM<sub>2.5</sub> of 250.5 µg/m<sup>3</sup> (NowCast Air Quality Index 301) or more, for a total of 15 minutes or less during a shift.
  - (e) Work within the scope of chapter 296-305 WAC, Safety Standards for Firefighters.

Note: Buses, light rail, and other enclosed vehicles used for transit systems where doors are frequently opened to board and deboard passengers are not included under the exemption in 296-62-08510(2)(b) WAC.

**WAC 296-62-08520 Definitions.**

**NowCast.** The method used by the U.S. Environmental Protection Agency (EPA), and the Washington State Department of Ecology to show the air quality for the most current hour available by using a calculation that involves multiple hours of past data. The NowCast uses longer averages during periods of stable air quality and shorter averages when air quality is changing rapidly, such as during a wildfire. The NowCast is generally updated every hour.

**NowCast Air Quality Index (AQI).** The method used by the U.S. Environmental Protection Agency (EPA) to communicate air quality using color coded categories. It shows the air quality for the most current hour available by using a

calculation that involves multiple hours of past data using the NowCast.

**NowCast PM<sub>2.5</sub>.** The concentration of PM<sub>2.5</sub> for the most current hour available by using a calculation that involves multiple hours of past data using the NowCast.

**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.

**PM<sub>2.5</sub>.** Solid particles and liquid droplets suspended in air, known as particulate matter, with an aerodynamic diameter of 2.5 micrometers or smaller. Measured in micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ).

**Wildfire Smoke.** Emissions from fires in wildlands or in adjacent developed areas. Wildfire smoke contains a complex mixture of gasses and particulates. Fine particulates such as PM<sub>2.5</sub> are the primary pollutant in wildfire smoke.

**Wildlands.** Sparsely populated geographical areas covered primarily by grass, brush, trees, crops, or combination thereof.

#### **WAC 296-62-08530 Identification of harmful exposures.**

The employer must determine employee exposure to PM<sub>2.5</sub> for worksites covered by this section before each shift and periodically thereafter, as needed, by any of the following methods:

- (1) Check PM<sub>2.5</sub> forecasts and the NowCast PM<sub>2.5</sub> from any of the following:
  - (a) Washington Department of Ecology website;
  - (b) Air Quality WA mobile app;
  - (c) Washington Smoke Information website;
  - (d) U.S. EPA AirNow website;
  - (e) EPA AirNow mobile app;
  - (f) U.S. Forest Service AirFire website;
  - (g) Local Clean Air Agency website; or
- (2) Obtain PM<sub>2.5</sub> forecasts and the NowCast PM<sub>2.5</sub> directly from the Department of Ecology, Local Clean Air Agency, U.S. EPA, EPA EnviroFlash.info, or local clean air agency by telephone, email, text, or other effective method; or
- (3) Measure PM<sub>2.5</sub> levels at the work location in accordance with Appendix A.

NOTE: Employers must check the NowCast PM<sub>2.5</sub> in a manner that they are able to comply with the requirements in chapter 296-62-085 WAC. The NowCast PM<sub>2.5</sub> is updated hourly.

If an index such as AQI is relied upon, use the following table to find the equivalent PM<sub>2.5</sub>.

<i>PM<sub>2.5</sub> in Micrograms per Cubic Meter (µg/m<sup>3</sup>)</i>	<i>Air Quality Index (AQI)</i>
20.5 µg/m <sup>3</sup>	69
35.5 µg/m <sup>3</sup>	101
555 µg/m <sup>3</sup>	Beyond the AQI

EXCEPTION: The employer does not have to determine employee exposure as required by this subsection if the employer assumes the NowCast PM<sub>2.5</sub> is more than 35.5 µg/m<sup>3</sup> (AQI 101) and uses that assumption to comply with the requirements in WAC 296-62-085.

**WAC 296-62-08540 Hazard communication.**

For any worksite covered by this section, the employer must establish and implement a system for communicating wildfire smoke hazards in a form 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:
  - (a) When at least two consecutive NowCast PM<sub>2.5</sub> readings as identified in WAC 296-62-08530 are 20.5 µg/m<sup>3</sup> (AQI 69) or more; and
  - (b) When the NowCast PM<sub>2.5</sub> as identified in WAC 296-62-08530 is 35.5 µg/m<sup>3</sup> (AQI 101) or more; and
  - (c) Protective measures available to employees to reduce their wildfire smoke exposures.
- (2) Enabling and encouraging employees to inform the employer of:
  - (a) Worsening air quality; and
  - (b) Availability issues of appropriate exposure control measures and respiratory protection required by this standard; and
  - (c) Any adverse symptoms that may be the result of wildfire smoke exposure such as, but not limited

to, asthma attacks, difficulty breathing, and chest pain.

- (3) A wildfire smoke response plan must be included in the written accident prevention program. The wildfire smoke response plan must be tailored to the workplace and include at least the following elements:
  - (a) Information on the health effects of wildfire smoke;
  - (b) Information on employee rights to obtain medical treatment without fear of reprisal;
  - (c) How employees can obtain the NowCast PM<sub>2.5</sub>;
  - (d) The requirements of WAC 296-62-085 Wildfire Smoke;
  - (e) The employer's response plan for wildfire smoke including the employer's methods to protect employees from wildfire smoke;
  - (f) The importance, limitations, and benefits of using a properly fitted respirator when exposed to wildfire smoke;
  - (g) How to properly put on, use, and maintain the respirators provided by the employer.

**WAC 296-62-08550 Information and training.**

The employer must provide all workers effective information and training regarding wildfire smoke before work that exposes the worker to a NowCast PM<sub>2.5</sub> of 20.5 µg/m<sup>3</sup> (AQI 69) or more, and at least annually thereafter.

- (1) Information and training must be provided in a manner and language readily understood by the workers.
- (2) At a minimum, the training must include the information in Appendix B:
  - (a) The health effects of wildfire smoke;
  - (b) The right to obtain medical treatment without fear of reprisal;
  - (c) How employees can obtain the NowCast PM<sub>2.5</sub>;
  - (d) The requirements of WAC 296-62-085 Wildfire Smoke;
  - (e) The employers response plan for wildfire smoke including methods to protect employees from wildfire smoke;
  - (f) The importance, benefits, and limitations of using a properly fitted respirator when exposed to wildfire smoke;
  - (g) How to properly put on, use, and maintain the respirators provided by the employer.
- (3) Supervisor training. Prior to supervising employees performing work that exposes the worker to PM<sub>2.5</sub> levels

that are  $20.5 \mu\text{g}/\text{m}^3$  (AQI 69) or more, supervisors must have training on the information in Appendix B, and the following topics:

- (a) The procedures the supervisor must follow to implement the applicable provisions of WAC 296-62-085 Wildfire Smoke;
- (b) The procedures the supervisor must follow if an employee exhibits adverse symptoms of wildfire smoke exposure, including appropriate emergency response procedures; and
- (c) Procedures for moving or transporting employees to an emergency medical service provider, if necessary.

**WAC 296-62-08560 Exposure symptom response.**

- (1) The employer must monitor employees displaying adverse symptoms of wildfire smoke exposure to determine whether medical attention is necessary.
- (2) Employers must allow employees who show signs of injury or illness due to wildfire smoke exposure to seek medical treatment, and may not retaliate against affected employees for seeking such treatment.
- (3) Employers must 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.

**WAC 296-62-08570 Exposure controls.**

- (1) Where the NowCast  $\text{PM}_{2.5}$  is  $20.5 \mu\text{g}/\text{m}^3$  (AQI 69) or more, the employer is encouraged to implement exposure controls.
- (2) Where the NowCast  $\text{PM}_{2.5}$  is  $35.5 \mu\text{g}/\text{m}^3$  (AQI 101) or more, the employer must implement exposure controls whenever feasible.
- (3) Such controls include:
  - (a) Providing enclosed buildings, structures, or vehicles where the air is adequately filtered.
  - (b) Providing portable HEPA filters in enclosed areas;
  - (c) Relocating work to a location with a lower ambient air concentration of  $\text{PM}_{2.5}$ ;
  - (d) Changing work schedules to a time with a lower ambient air concentration of  $\text{PM}_{2.5}$ ;
  - (e) Reducing work intensity;
  - (f) Providing additional rest periods.

EXCEPTION: In emergencies, including rescue and evacuation, engineering and administrative controls in WAC 296-62-08570(2) are not required. Emergencies include utilities, communications, and medical operations, when such operations are directly aiding firefighting or emergency response.

**WAC 296-62-08580 Respiratory Protection.**

- (1) Where the NowCast  $PM_{2.5}$  is  $20.5 \mu\text{g}/\text{m}^3$  (AQI 69) or more, the employer is encouraged to provide respirators at no cost to employees upon request. Employees may provide and wear their own respiratory protection as long as voluntary use of these protective devices and equipment does not introduce hazards to the work environment.
- (2) Where the NowCast  $PM_{2.5}$  is  $35.5 \mu\text{g}/\text{m}^3$  (AQI 101) or more, the employer must provide respirators at no cost to all employees, and encourage employees to use respirators.
  - (a) Respirators must be provided by either of the following methods:
    - (i) Distribute directly to each exposed employee; or
    - (ii) Maintain a sufficient supply for all exposed employees at each work location where exposure occurs. Such respirator supply availability and locations must be made known, and be readily accessible, to all exposed employees in a manner that does not restrict or hinder employee access to obtain and replace respirators when needed.
  - (b) Employers must use Appendix B of this section in lieu of the advisory information in Table 2 of WAC 296-842 for training regarding voluntary use of respirators for wildfire smoke.
- (3) Where the NowCast  $PM_{2.5}$  is  $555 \mu\text{g}/\text{m}^3$  or more, employees must be enrolled in a complete respiratory protection program in accordance with chapter 296-842 WAC. The employer must provide and require to be worn one of the following respirators equipped with high efficiency particulate air filters:
  - (a) Loose-fitting powered air purifying respirator; or
  - (b) Full-facepiece air purifying respirator; or
  - (c) Full-facepiece powered air purifying respirator; or
  - (d) Other respirators that are at least as effective.
- (4) Respirators must be NIOSH-approved devices that effectively protect the wearers from inhalation of  $PM_{2.5}$ , such as N95 filtering facepiece respirators.

- (5) Respirators must be cleaned, stored, maintained, and replaced so that they are in good working order, and do not present a health hazard to users. Replace any respirator that is not functioning properly, and do not permit their use.

NOTE: For voluntary use of filtering facepiece respirators, such as N95 respirators, some of the requirements of WAC 296-842 Safety Standards for Respirators, do not apply, such as fit testing and medical evaluations. If elastomeric respirators are used voluntarily, additional requirements from WAC 296-842 Respirators apply such as medical evaluations and establishing a respiratory protection program.

**Appendix A: Protection from Wildfire Smoke Measuring PM<sub>2.5</sub> Levels at the Worksite (Mandatory if an Employer Monitors with a Direct Reading Instrument).**

- (1) An employer may use a direct-reading particulate monitor to identify harmful exposures as required by WAC 296-62-08530, if the employer can demonstrate that it has complied with this appendix and selected a monitor that:
  - (a) Does not underestimate employee exposures to wildfire smoke; or
  - (b) 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 PM<sub>2.5</sub> to ensure that employee exposure levels are not underestimated.
- (2) The monitor must have a field  $r^2$  for PM<sub>2.5</sub> greater than 0.7 as measured by the South Coast Air Quality Management District's air quality sensor performance evaluation center (AQ-SPEC) [www.aqmd.gov/aq-spec](http://www.aqmd.gov/aq-spec).
- (3) The monitor must be designed and manufactured to measure the concentration of airborne particle sizes ranging from an aerodynamic diameter of 0.3 micrometers or less, up to and including 2.5 micrometers ( $\leq 0.3 \mu\text{m}$  to  $2.5 \mu\text{m}$ ). The employer may use a monitor that measures a particle size range beyond these limits, if the employer treats the results as the PM<sub>2.5</sub> levels.
- (4) The employer must 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 PM<sub>2.5</sub> concentrations.



(5) The person supervising, directing, or evaluating workplace monitoring for PM<sub>2.5</sub> must 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.

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

(1) 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.

Sensitive Groups. People who are at higher risk of experiencing adverse health effects as a result of exposure to wildfire smoke including those with pre-existing health conditions; ; those with increased duration of exposure; and those whose work increases breathing rate including outdoor workers. Although everyone is impacted by wildfire smoke exposure, sensitive groups are among those most likely to experience health problems from exposure to wildfire smoke. Examples of sensitive groups include:

- People with lung diseases 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, colds, flu, or those with, or recovering from COVID-19;
- 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;
- People with other medical or health conditions which can be exacerbated by exposure to wildfire smoke as determined by a physician.

- Outdoor workers.

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

Employers must 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 must 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.

(3) How employees can obtain the NowCast PM<sub>2.5</sub> in the air.

Various government agencies monitor the air at locations throughout Washington and report the NowCast PM<sub>2.5</sub> for those places. The Air Quality Index (AQI) uses the air quality data from these regulatory monitors.

Although the government monitoring stations may measure several pollutants, this chapter only uses PM<sub>2.5</sub>.

The easiest way to find the NowCast and forecasted PM<sub>2.5</sub> is to go to [enviwa.ecology.wa.gov](http://enviwa.ecology.wa.gov) and find the nearest sensor on the map, or [www.AirNow.gov](http://www.AirNow.gov) and enter the zip code of the location where you will be working. The NowCast PM<sub>2.5</sub> is also available from the U.S. Forest Service at [tools.airfire.org](http://tools.airfire.org). Employees who do not have access to the internet can contact their employer for the NowCast PM<sub>2.5</sub>. The EPA website [www.enviroflash.info](http://www.enviroflash.info) can transmit daily and forecasted air quality by text or email for particular cities or zip codes.

If you choose to use an index such as AQI, use following table to find the equivalent AQI for PM<sub>2.5</sub>.

PM2.5 in Micrograms per Cubic Meter (µg/m <sup>3</sup> )	Air Quality Index (AQI)
20.5 µg/m <sup>3</sup>	69
35.5 µg/m <sup>3</sup>	101
555 µg/m <sup>3</sup>	Beyond the AQI

(4) The requirements of WAC 296-62-085 wildfire smoke rule.

If employees may be exposed to wildfire smoke, then the employer is required to:

- (a) Check the NowCast PM<sub>2.5</sub> before and periodically during each shift.

- (b) Provide training to employees.
- (c) Implement a two-way communication system.
- (d) Provide engineering and administrative controls when the NowCast PM<sub>2.5</sub> is 35.5 µg/m<sup>3</sup> (AQI 101) or more if feasible.
- (e) Provide respirators and encourage their use when the NowCast PM<sub>2.5</sub> is 35.5 µg/m<sup>3</sup> (AQI 101) or more.

Employers must alert employees when at least two consecutive NowCast PM<sub>2.5</sub> readings are 20.5 µg/m<sup>3</sup> (AQI 69) or more, and when the NowCast PM<sub>2.5</sub> is 35.5 µg/m<sup>3</sup> (AQI 101) or more, and what protective measures are available to employees.

Employers must 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: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The employer's methods to protect employees from wildfire smoke.

Employers must take action to protect employees from wildfire smoke when the NowCast PM<sub>2.5</sub> is 35.5 µg/m<sup>3</sup> (AQI 101) or more. Examples of protective methods include:

- (a) Locating work in enclosed structures or vehicles where the air is filtered.
- (b) Changing procedures such as moving workers to a place with a lower PM<sub>2.5</sub>.
- (c) Reducing work time in areas with unfiltered air.
- (d) Increasing rest time and frequency, and providing a rest area with filtered air.
- (e) Reducing the physical intensity of the work to help lower the breathing and heart rates.

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

(5) The importance, limitations, and benefits of using a properly fitted 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 PM<sub>2.5</sub> is less than 20.5 µg/m<sup>3</sup>, to provide additional protection.

When the NowCast PM<sub>2.5</sub> is 20.5 µg/m<sup>3</sup> (AQI 69) or more, your employer is encouraged to make proper respirators available to workers who may choose to use them voluntarily.

When the NowCast PM<sub>2.5</sub> is 35.5 µg/m<sup>3</sup> (AQI 101) or more, your employer must make proper respirators available to workers who may choose to use them voluntarily.

A respirator should be used properly and kept clean.

The following precautions must be taken:

- (f) Employers must 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). KN95 respirators may also be used if adequate supply of NIOSH approved respirators is not available.

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.

- (g) Read and follow 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 for medical evaluations, fit testing, and shaving should also be followed to ensure the best protection against wildfire smoke, although doing so is not required for voluntary use of filtering facepiece respirators.
- (h) 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 workers against gases or vapors, and it will not supply oxygen.

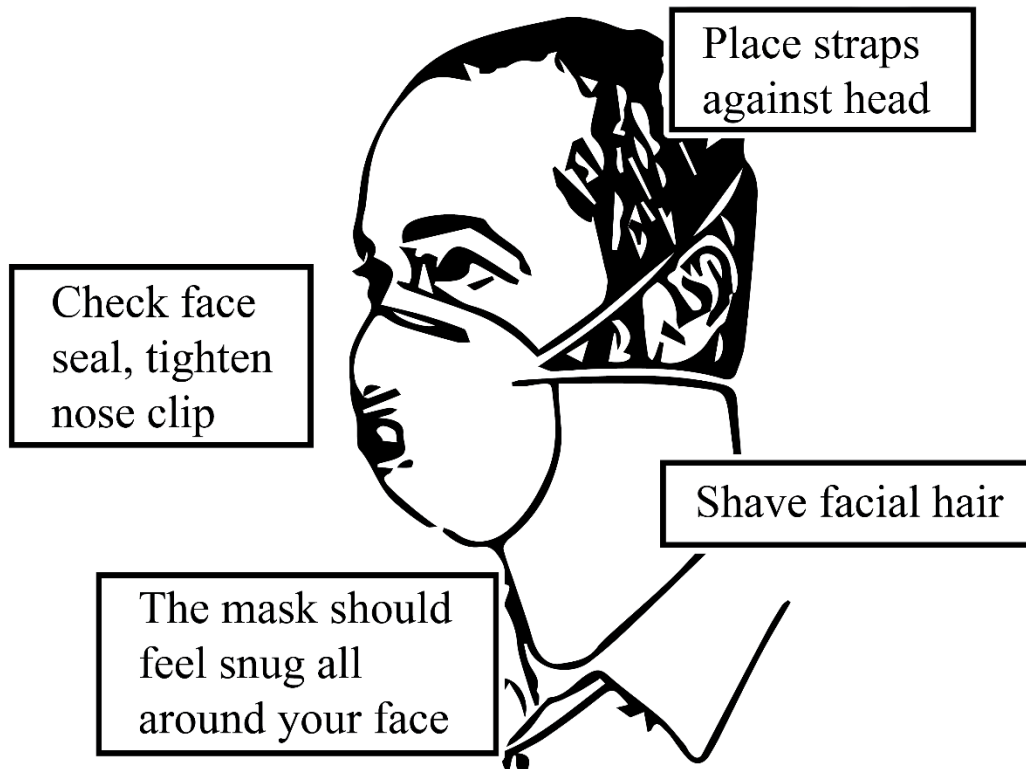
- (i) Employees should keep track of their respirator so that they do not mistakenly use someone else's respirator.
  - (j) Employees who have a heart or lung problem should ask their doctor before using a respirator.
- (6) How to properly put on, use, and maintain the respirators provided by the employer.

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 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:

- (a) Place the mask over the nose and under the chin, with one strap placed below the ears and one strap above.
- (b) Pinch the metal part (if there is one) of the respirator over the top of the nose so it fits securely.
- (c) Perform a seal check:
  - (i) Cover the respirator with both hands and exhale. If air leaks where the respirator seals against the face, readjust the respirator and nosepiece and try again. When a proper fit is achieved, the respirator should bulge from the face and not leak around the seal.
  - (ii) Cover the respirator with both hands and inhale. If air leaks where the respirator seals against the face, readjust the respirator and nosepiece and try again. When a proper fit is achieved, the respirator should collapse slightly and not leak around the seal.



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, take off the respirator, and get medical help.