

Respirator Program

Purpose

[Company name] has determined that our workers in [locations/departments] are potentially exposed to the following respiratory hazards during routine operations:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

The purpose of this program is to ensure that respirators used by our workers provide effective protection against airborne contaminants in our workplace(s).

Note that before considering respirators as a way to control exposure, the employer is required to first consider engineering or administrative controls to eliminate or minimize the risk of exposure. Examples of such controls include ventilation, enclosing the process, substituting less hazardous products, and other effective means.

Responsibilities

Employer

The employer is responsible for:

- Implementing a written respirator program and designating a respirator program administrator
- Ensuring that the worksite is evaluated for breathing hazards
- Eliminating or minimizing all breathing hazards
- Providing and maintaining respirators needed for any airborne hazard present at the worksite, and ensuring that workers use the equipment when required
- Providing materials for workers to clean their respirators
- Providing supervisors with the education and training necessary to ensure that workers use respirators safely
- Providing workers with the education, training, and supervision necessary for safe use of respirators
- Developing emergency evacuation procedures and ensuring that supervisors and workers receive appropriate training in any workplace where workers may need to be rescued or evacuated because of breathing hazards
- Ensuring that all illnesses or injuries resulting from breathing hazards and requiring medical aid are reported and recorded
- Requiring a medical assessment if there is a concern about a worker's ability to wear a respirator

Program administrator

The program administrator [insert name] is responsible for:

- Assessing the type and amount of exposure
- Selecting the appropriate respirators
- Implementing training and instruction programs
- Administering the overall program, including the maintenance of records
- Reviewing the program on an annual basis

Supervisors

Supervisors are responsible for ensuring that:

- Workers are aware of breathing hazards on the worksite(s)
- Respirators are available when required
- Workers use respirators correctly as required
- Workers are clean-shaven
- Respirators are properly cleaned, inspected, maintained, and stored
- Workers are aware of any equipment or clothing that may interfere with respirator use
- Working conditions are monitored in order to alert supervisors of exposure to higher concentrations of a contaminant or a new contaminant
- Workers are aware of potential issues that may develop during respirator use, such as discomfort, skin irritation, or breathing difficulty
- The program administrator is notified of concerns or conditions that might affect workers' respiratory protection

Workers

Workers are responsible for:

- Understanding and following safe work procedures
- Using their respirators as instructed
- Understanding the limitations of their respirators and following the manufacturers' instructions
- Inspecting their respirators before use
- Immediately reporting any equipment problems to their supervisors
- Properly cleaning and storing their respirators

Respirator selection

The selection of a respirator must be appropriate to the contaminant, its concentration, and the level of protection provided by the respirator (i.e., the protection factor and maximum use concentration).

Only respirators bearing NIOSH/MSHA (U.S. Mine Safety and Health Administration) approval or other respirators acceptable to WorkSafeBC will be provided to workers.

The following respirators are available to workers and are to be worn for the work activities listed below.

Work activity	Contaminants	Type of respirator

Always read cartridge or filter labels and instruction manuals prior to use and be certain the correct cartridge or filter is selected.

For example: a) organic vapour cartridge respirators do not provide adequate protection against isocyanate-based automotive paints; b) only fume-rated particle masks provide protection against welding fumes.

Respirator fitting

To fit properly and provide protection, respirators that are designed to fit the face, such as rubber half-masks, must have an effective seal.

Workers using this type of respirator must be clean-shaven in the area where the respirator seals with the face (i.e., no visible stubble). Workers will receive a fit test once a year (see the “Respirator fitting procedures” section).

[insert name] will arrange fit testing and keep records of the results of these tests.

Worker training

Every worker who may have to wear a respirator will be trained in the proper use of the respirator. Both the worker and his/her supervisor receive this training. This training includes:

- Description of the type and amount of exposure
- Description of the respirator
- The intended use and limitations of the respirator
- Proper wearing, adjustment, and testing for fit
- Cleaning and storage methods
- Inspection and maintenance procedures

This training is repeated as often as necessary, at least annually, to ensure that workers remain familiar with the proper use of the respirators. A record will be kept of this training.

The training program is evaluated at least annually by [insert name] to determine that it continues to be effective.

Always refer to the respirator instruction manual for information.

Proper use of respirators

Corrective eyewear or other equipment must not interfere with the seal of the respirator.

No covering can be used which passes between the respirator facepiece and the wearer's face.

Respirators will be inspected before and after every use. Straps, valves, cartridges, other respirator parts, and general cleanliness will be checked. See the respirator instruction manual.

User seal checks will be performed, where applicable, by respirator users each time they put on their respirators.

High contaminant levels and other factors such as high humidity can affect filters or cartridges. Workers noting a resistance to breathing, a smell or taste of chemicals within the respirator, or an irritation shall immediately leave the work area and report to their supervisor. After an investigation rules out other reasons, such as failure of ventilation systems, respirators shall be checked and new filters or cartridges installed.

When wearing respirators, workers experiencing any of the following must leave the contaminated area:

- Nausea
- Dizziness
- Eye irritation
- Unusual odour or taste
- Excessive fatigue
- Difficulty breathing

The program administrator will determine whether or not a worker may be allowed to wear a respirator. Where there is any doubt on the part of the worker or program administrator about the worker's ability to wear a respirator, the worker is to be examined by a physician. Certain medical conditions, such as lung disease (e.g., asthma or emphysema) or heart disease, may affect the worker's ability to wear a respirator.

Cleaning, maintenance, and storage of respirators

Respirators will be maintained, cleaned, and stored as described by the manufacturer's instructions. Where respirators are shared, they will be cleaned and sanitized after each use. Follow the manufacturer's recommendations for sanitizing.

The following procedure can be used to clean and sanitize most respirators:

1. Remove any filters, cartridges, or canisters.
2. Wash the respirator (and associated parts) in warm water mixed with a mild detergent (or a mild detergent plus bleach).
3. Rinse the respirator in clean, warm water.
4. Wipe the respirator with disinfectant wipes (70% isopropyl alcohol) or a sanitizing foam to kill germs.
5. Air dry in a clean area.
6. Reassemble the respirator (e.g., replace the cartridges).
7. Place in a clean, dry plastic bag (or other container).

Defective respirators shall not be used. If during an inspection, a worker discovers a fault or defect in a respirator, he/she will bring it to the attention of the supervisor. The worker or supervisor will attempt to repair the defective respirator. If the respirator cannot be repaired, it will be given to the program administrator.

The program administrator will:

- Perform a simple fix, such as the replacement of a valve or head strap, or
- Take the respirator out of service until it can be repaired, or
- Dispose of the defective respirator and provide a new one

A supply of replacement parts, filters, cartridges, etc. is available at [location].

After inspection, cleaning, and necessary repairs, respirators will be properly stored in plastic bags, storage cabinets, or lockers.

Respirator fitting procedures

User seal checks

When you are satisfied that you have found a respirator that fits, there are two simple checks to test the seal. You must do at least one of these checks each time you put on your respirator.

Before doing any seal check, make sure your respirator has all its inlet and exhaust valves. Make sure that the valves are in good condition and lie flat. Doing these checks will help you tell whether you have a good seal and whether the valves are in place and working.

If the respirator is to be used with any other personal protective equipment – such as goggles, hearing protection, or a hard hat – all seal checks must be done while you are wearing this equipment.

Negative-pressure user seal check

This test is called a “negative-pressure” user seal check because you create a slightly negative air pressure inside the respirator facepiece by inhaling. Follow these instructions:

1. Put on the respirator and other associated personal protective equipment. Tighten the head straps until the respirator feels snug but comfortable. Wear the respirator for a few minutes so that it will warm up and conform to your face better.
2. Close off the inlet opening of the cartridges or filters by covering them gently with the palms of your hands, a plastic bag, a special adapter, or gloves (in some cases, you may have to remove the cartridges so you can cover the inlet valves). If you are carrying out this test while wearing a PAPR or an air-supplied respirator, close off or disconnect the hose to stop the air flow.
3. Breathe in slightly to create a vacuum.
4. Hold for 10 seconds.
5. If you have a good seal, the facepiece should collapse slightly against your face and stay collapsed. No air should leak into the facepiece past the sides, top, or bottom.



For a negative pressure seal check, close off the inlet openings with your palms and inhale gently.

If the facepiece doesn't collapse and stay collapsed, there is an air leak. Check the exhalation valve(s) and try repositioning the respirator on your face and adjusting the head straps. Carry out the negative-pressure seal check again. If you cannot get a seal after a few attempts, try another size, make, or model of respirator. Repeat the check until you find a respirator that passes the seal check.

Positive-pressure user seal check

This test is similar to the negative-pressure user seal check except that you breathe out slightly while gently covering the exhaust valve with your palm. This creates positive pressure in the facepiece. If you have a good seal, the facepiece will bulge or puff out slightly from your face. Again, no air should leak past the sides, top, or bottom of the respirator.

1. Put on the respirator and other associated personal protective equipment. Tighten the head straps until the respirator feels snug but comfortable. Wear the respirator for a few minutes so that it will warm up and conform to your face better.
2. Close off the exhaust valve opening by covering it with the palm of your hand.
3. Breathe out *slightly* to force air into the facepiece.
4. Hold for 10 seconds.
5. If you have a good seal, the facepiece should bulge out and stay out. No air should leak out of the facepiece past the sides, top, or bottom.

If the air does leak out, check the inhalation valves and try repositioning the respirator on your face and adjusting the head straps. If you cannot get a seal after a few attempts, try on another size, make, or model of respirator. Repeat the check until you find a respirator that passes the seal check.



For a positive-pressure seal check, cover the exhaust valve and breathe out slightly.

Note that the configuration of some air-purifying respirators may make it impossible to conduct an effective positive-pressure check without dislodging the facepiece. Consult the manufacturer's instructions to see whether the positive-pressure user seal check applies to the respirator.

Fit testing

After the respirator has passed either the positive- or the negative-pressure user seal check, another test of the seal, called a *fit test*, must be done and the results recorded.

When fit tests are performed, workers must be clean-shaven and must wear all other protective equipment that they need, such as goggles and hard hats. Prescription eyeglasses must not interfere with the seal of the respirator (specialty eyeglasses are available). Ideally, fit tests should be done under operating conditions similar to those that workers would experience at the worksite.

There are two types of fit testing: qualitative and quantitative. In qualitative fit testing, workers with poorly sealing respirators will detect an irritant, an odour, or a taste when exposed to a test agent. In quantitative fit testing, specialized equipment is used to actually measure the amount of the test agent leaking into the facepiece.

Our workplace utilizes qualitative fit testing procedures.

Irritant smoke fit test

In this test, a worker wearing a respirator is exposed to an irritating smoke (stannic chloride). If the respirator fits properly, no smoke will leak into the facepiece and be detected by the worker. If smoke does leak in, it will cause an involuntary reaction in the worker, such as coughing. It is important to follow instructions carefully to avoid exposing workers to any unnecessary smoke irritation. The smoke can be irritating to the eyes and airways.

Caution: This test agent may be an irritant to the worker being fit tested or to the tester. Do not use this test agent to fit test workers with respiratory sensitivities. The tester should consider wearing a respirator if a number of fit tests are being performed.

Irritant smoke threshold screening

1. Break off both ends of the smoke tube and insert one end into the rubber bulb (watch for the other exposed sharp end).
2. Squeeze the bulb to force air through the tube and produce smoke.
3. Warn the worker that the smoke can be irritating and that he or she should keep eyes closed throughout the test.
4. Carefully direct a small amount of the smoke in the worker's direction.
5. Discard used tubes in sharps containers at the end of the test.
6. After the worker coughs, proceed with the fit test procedure.

Irritant smoke fit test procedure

The worker should put on the respirator and all other personal protective equipment, such as eye protection or a hard hat. A successful seal check must be done before the fit test.

Irritant smoke tests must be conducted with facepieces equipped with combination organic vapour/acid gas (OV/AG) and "100" (HEPA) filter cartridges. After the respirator has passed the fit test, the facepiece can be fitted with the appropriate filter or cartridge necessary for protection in the workplace.

Do not place a hood or bag over the head of the test subject. The test must be performed in a location with sufficient ventilation to prevent contamination of the work area and ventilation system.

Use a well-ventilated room or area to carry out the irritant smoke tests (both threshold screening and the fit test).

The following exercises shall be performed while the respirator seal is being challenged by the smoke:

- Normal breathing.
- Deep breathing. Be certain breaths are deep and regular.
- Turning head from side to side. Be certain movement is complete.
- Nodding head up-and-down. Be certain motions are complete. Alert the test subject not to bump the respirator on the chest. Have the test subject inhale when his/her head is in the fully up position.
- Talking. Slowly and distinctly, count backwards from 100.
- Normal breathing.

Each exercise shall be performed for one minute.

1. While the worker performs the first fit test exercise (above), pass the smoke stream around the perimeter of the facepiece. You should direct the smoke at the facepiece seal, starting with the smoke stream about 30 cm (12 in.) away from the respirator. Go around the seal a total of three times, gradually bringing the smoke to within 5 cm (2 in.) of the respirator. If the worker does not detect the stream of smoke by coughing, continue with the next fit test exercise. Repeat this step for each of the six exercises.
2. Because the smoke can be irritating, do not direct puffs of smoke at the eyes, and keep the smoke tube at least 5 cm (2 in.) away from unprotected skin. Ask workers to keep their eyes closed if they are being fitted with a half-facepiece respirator.

3. If the worker does not cough, then no smoke has leaked into the facepiece, and the respirator has passed the fit test. Fill out the fit test record.

Caution: Testers must be careful with the sharp, broken end of the smoke tube. Coughing workers may unexpectedly jab themselves if they make sudden movements. The fit tester may wish to cover the broken end of the tube with a short length of tubing. Always discard used tubes in sharps containers at the end of the test.

Bitter aerosol taste fit test

In this test, a worker is exposed to a spray containing denatonium benzoate. It has an extremely bitter taste. The worker wears a respirator equipped with any particulate filter and puts on a test enclosure or hood that covers the head and shoulders. The fit tester exposes the worker to the bitter aerosol by spraying the test solution into the enclosure. Because it is a very bitter solution, it can be easily detected by the worker if it leaks through the face seal. If the worker cannot taste the bitter aerosol after the predetermined number of squeezes, it means that the respirator fits properly.

A bitter aerosol fit testing kit can be purchased from suppliers of safety equipment. These kits contain pre-mixed solution as well as instructions for administering the fit test.

Workers should not eat, drink (except plain water), smoke, or chew gum for at least 15 minutes before taking the bitter aerosol fit test.

Before conducting the test, make sure the worker being fit tested can detect the bitter taste by performing a threshold screening check. The threshold screening should be done under a test hood, and the worker being tested should not wear a respirator.

Caution: This test agent may affect workers with respiratory sensitivities.

Bitter aerosol threshold screening

1. Instruct the worker to breathe through a slightly open mouth with the tongue extended.
2. Ask the worker to let you know when a bitter taste can be detected.
3. Insert a nebulizer containing the threshold check solution into an opening located at the front of the test hood. Direct the spray away from the worker's breathing zone.
4. Rapidly squeeze the bulb of the nebulizer 10 times and ask if the worker can taste the bitter aerosol.
5. If the worker cannot taste the bitter aerosol, rapidly squeeze the nebulizer bulb 10 more times and ask again if the worker can taste it. If the response is still negative, squeeze the nebulizer bulb 10 more times.
6. Once the worker reports tasting the bitter taste, proceed with the fit test. If the worker cannot detect the bitter taste after 30 squeezes, perform a different fit test.

Bitter aerosol fit test procedure

The worker should put on the respirator and all other personal protective equipment, such as eye protection or a hard hat. A successful seal check must be done before the fit test.

1. Prepare a solution made of bitter aerosol and salt solution in warm water and pour the solution into a nebulizer.
2. Have the worker put on a test hood while wearing the respirator. The front portion of the hood should be clear of the respirator and provide sufficient room for free head movement.
3. Instruct the worker to breathe through a slightly open mouth with the tongue extended. Ask the worker to let you know if a bitter taste can be detected.
4. Insert the nebulizer filled with prepared solution into the opening in the test hood directly in front of the worker's nose and mouth. Direct the spray away from the worker's breathing zone.
5. Firmly squeeze the bulb of the nebulizer containing the test solution either 10, 20, or 30 times, depending on the worker's sensitivity to the bitter aerosol (as determined by threshold screening).
6. Instruct the worker to perform the six fit test exercises and tell you if a bitter taste can be detected.
7. Every 30 seconds, replenish the aerosol concentration by squeezing the nebulizer bulb half the number of squeezes used previously (i.e., use 5, 10, or 15 squeezes). Squirt the solution into the test hood.
8. If the worker reports tasting the bitter aerosol, the respirator has failed the fit test. If the worker cannot detect the bitter aerosol, the respirator has passed the fit test.

Saccharin solution aerosol fit test

This test is similar to the bitter aerosol solution fit test. Instead of using a bitter-tasting aerosol, the fit tester exposes the worker to the sweet taste of saccharin. The threshold screening and the fit test are done in a test enclosure or hood that covers the head and shoulders.

The saccharin solution threshold screening is identical to that of the bitter aerosol, except that the worker must demonstrate the ability to detect the sweet taste of the test agent.

For the fit test, a worker wears a respirator equipped with any particulate filter. The tester sprays the test solution into the test hood, directly in front of the worker's nose and mouth. If the worker cannot detect a sweet taste after either 10, 20, or 30 squeezes, it means that the respirator fits properly.

Workers should not eat, drink (except plain water), smoke, or chew gum for at least 15 minutes before taking the saccharin solution aerosol fit test. Workers who eat or drink something sweet before the test may not be able to detect the taste of saccharin and must not be allowed to undergo the fit test.



A bitter or sweet solution is sprayed into the test hood for the bitter aerosol or saccharin fit test.

Isoamyl acetate (banana oil) fit test

This test is similar to the bitter aerosol and saccharin fit tests in that the threshold screening and the fit test are done in a test enclosure. A worker wearing a respirator is exposed to a compound called isoamyl acetate (known as banana oil), which smells strongly like bananas. Before starting the test, you must make sure the person being fit tested can smell the banana oil. If the worker cannot smell the banana oil, perform the fit test using another test agent. For complete instructions on how to conduct this test, refer to *CSA Standard CAN/CSA-Z94.4-02, Selection, Use, and Care of Respirators*.

Since banana oil is a vapour, it can be used to fit test only air-purifying respirators that take a cartridge. The respirator should be fitted with an organic vapour cartridge. After the respirator has passed the fit test, attach the appropriate filter or cartridge for the workplace contaminant.

Respirator selection information form

Process/operation information		
Work area location:	<div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div>	
Work area characteristics (open area, confined space, etc.):	<div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div>	
Location of hazardous area relative to safe area:	<div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div>	
Work description/operation:	<div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div>	
Anticipated length of time that respirator will be used:		
Worker activity level (light, moderate or heavy):		
Information for each breathing hazard		
Step 1:	Oxygen level (if below 19.5%, air-purifying respirators cannot be used)	%
Steps 1, 2:	Air contaminant and concentration	
Step 3:	8-hour TWA limit	
Step 4:	IDLH concentration	
Step 5:	Can the contaminant cause eye irritation?	
Step 5:	Can the contaminant irritate skin or be absorbed through the skin?	
Step 6:	Respirator under consideration and assigned protection factors	
Step 7:	Hazard ratio (minimum protection factor)	
Step 8:	Maximum use concentration (MUC)	
Step 9:	Air-supplying or air-purifying respirator?	
Step 10:	State of contaminant	
Step 11:	Adequate warning properties (odour, irritation, etc.)?	

Recommended approved respirator(s):	<hr/> <hr/> <hr/> <hr/>
Recommended approved filter or cartridge:	<hr/> <hr/> <hr/> <hr/>
Other protective equipment required:	<hr/> <hr/> <hr/> <hr/>

Respirator inspection checklist for air-purifying respirators

Filtering facepiece

- Check for:
- Holes in the filters
 - Worn-out (torn, no longer elastic) or missing straps
 - Missing or curled valves
 - Folds, creases, or distortion in the facepiece

Air-purifying respirators with replaceable cartridges or filters

- Check the facepiece for:
- Dirt
 - Cracks, tears, holes
 - Warped surfaces
 - Broken fittings (for example, strap holders)
 - Cracked, scratched, or loose-fitting lenses (full-face models)
 - The presence of filter seal gaskets (if the respirator has gaskets)

- Check the head straps for:
- Wear and tear
 - Lack of elasticity, knots
 - Broken or faulty buckles

- Check the valves for:
- Soap residue or dirt on valves or on the valve seat
 - Cracks, tears, hardening, or warps in the valves or the valve seat
 - Missing or damaged valve cover
 - Valves that are curled under the valve seat

- Check that the cartridges or filters are:
- Made by the same manufacturer as the respirator
 - The correct type for the hazard
 - Fitting securely in the facepiece (threads are not worn)
 - Free from cracks or dents
 - Marked with the date they were put into service

Powered air-purifying respirators (PAPRs)

- In addition to the previous checklist items, check the:
- Condition of battery pack, wires, and connections
 - Airflow (does it meet manufacturer's specifications?)
 - Condition of breathing tube (if respirator has one)

Respirator fit test form

Name of worker:

Date:

Does the worker wear/have:

Eyeglasses
 Dentures

Contact lenses
 Facial hair

If yes to any of the above, discuss how the respirator seal will be affected (workers must be clean-shaven where the respirator seals with the face). Other comments regarding counselling on eyeglasses, dentures, contact lenses and facial hair:

Does the worker have any medical concerns about wearing a respirator?

Yes

No

If yes, refer worker for a medical assessment.

Fit test procedure

Fit testing must be repeated annually to ensure that a proper face seal is maintained.

Check when completed successfully: Correct positioning of respirator and strap adjustment
 Negative- and positive-pressure user seal check

Qualitative fit testing using: Irritant smoke with HEPA/organic vapour cartridges
 Bitter aerosol with particulate filter
 Isoamyl acetate (banana) oil with organic vapour cartridges

Saccharin with particulate filter
 Other _____

Qualitative fit testing: Pass
 Fail

Quantitative fit testing: Pass
 Fail

Respirator(s) fit tested by worker

When a worker wears different makes and models of respirators, fit testing must be done on each make and model of respirator and the results recorded. The worker should also wear all other required personal protective equipment, such as hearing and eye protection, while undergoing the test.

Make/model/size

Make/model/size

Make/model/size

Points discussed with the worker

- Respirator selection
- Respirator limitations
- Storage and maintenance
- Cartridge dating, change frequency, and limitations
- Where to get replacement parts

Fit test date:

Next fit test date:

Fit tested by:

Comments: