

Fit Testing a Respirator for Pesticide Applications

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This publication covers how to conduct a fit test for respirators used when applying pesticides. A person who performs a fit test does not need to be certified, but must know how to conduct a fit test. Practice giving a fit test until you feel comfortable with the process before conducting an actual fit test.

Use of a Respirator

Anyone working with a pesticide must follow all personal protective equipment (PPE) requirements listed on the label. This is for safety, and also is a legal requirement for using pesticides. Pesticides that carry a risk of inhalation exposure require the use of a respirator. This may be a particulate filtering facepiece respirator (formerly known as dust/mist respirator), full- or half-face cartridge (air purifying) respirator with chemical cartridges and/or particulate filters, or self-contained breathing apparatus (SCBA).

The United States Occupational Safety and Health Administration (OSHA) is responsible for ensuring a safe workplace for employees. Related to agriculture, OSHA can conduct enforcement activities on any person engaged in a farming operation with more than 10 non-family employees, or has maintained a temporary labor camp within the preceding 12 months. These farms must follow OSHA requirements regarding the use of respirators. See the OSHA *Small Entity Compliance Guide for the Respiratory Protection Standard* (2011) at <https://www.osha.gov/Publications/3384small-entity-for-respiratory-protection-standard-rev.pdf>. This publication does not address those farms that must follow all OSHA requirements for respirators.

A pesticide label may have information about Agricul-

tural Use Requirements, indicating that the product must be used in accordance with its labeling and the Worker Protection Standard (WPS). The purpose of WPS is to reduce risks of illness or injury due to occupational exposures to pesticides. Through WPS, employers are required to ensure that their employees will be informed about exposure to pesticides, ensure that they will be protected from exposure to pesticides, and that employers will address pesticide exposures that they may experience. Under the 2015 revisions to WPS, ag owners/employers, their employees, and family members who use a pesticide that falls under WPS and requires the use of a respirator must follow some OSHA respirator requirements, as well. Although at the time of writing this publication, the implementation date has yet to be determined, we recommend you follow these (future) WPS requirements now. You will be ready when implementation is required. In general, even those to whom WPS does not apply should consider following the requirements that employees have a medical evaluation, fit test, and training prior to using a respirator. For information, see <http://www.osha.gov> and search for *respirator*.

Under the 2015 revisions to WPS, if the pesticide product label requires the handler (applicator, mixer/loader, etc.) to use a respirator, the employer must ensure the handler has:

- a medical evaluation to determine whether the handler is medically able to use a respirator;
- a follow-up visit with a physician, if deemed necessary;
- all respiratory equipment required by label for the product(s) the handler will use;

- annual training on the proper use, seal checking, care, and maintenance of the respiratory equipment; and
- annual fit testing with each respirator the handler will use.

Although the agricultural owner and immediate family members are exempt from some WPS requirements, they must follow requirements regarding the use of respirators. We recommend that anyone who uses a pesticide that requires respiratory protection have a medical evaluation, fit test, and training before using a respirator.

What Is a Fit Test?

A respirator must form an adequate seal with the wearer's face to protect against inhaling materials that could cause harm; the fit test determines whether the respirator fits properly to form that seal. OSHA recognizes two main types of fit testing, quantitative and qualitative. The quantitative fit test measures the amount or quantity of solution that penetrates the face mask. This type of fit test requires specialized equipment (*Figure 1*) for analysis, and will not be covered in this publication.



Figure 1. Equipment used for a quantitative fit test. UNL Photo.

The qualitative fit test determines if the respirator fits properly by testing if the person wearing the respirator can detect a taste or an odor. This publication will focus on a qualitative fit test for a person (called the subject) wearing a respirator.

Why Have a Fit Test?

Fit tests are not required for loose-fitting respirators, such as hoods, helmets, and loose-fitting facepieces because a tight seal is not needed for the equipment to protect the user. Fit tests are required for respirators with tight-fitting facepieces.

These include disposable particulate filter masks, half-masks, and full-face masks. These also include face masks used with a powered or air-fed respirator. As discussed earlier, a fit test may be required by WPS. Even if not required, we recommend that a fit test be performed when a tight-fitting respirator is used to ensure that a proper seal can be formed. We also recommend that even if not required, the subject have a medical evaluation prior to the fit test, to ensure that the person is physically able to use a respirator. A person with certain health problems or medical conditions could be injured due to the stress a respirator can cause. The person giving the fit test must be knowledgeable about fit tests.

When Should a Fit Test Be Conducted?

A fit test should be done before using a respirator, and whenever the person uses a different size, style, model or make. According to the revised WPS, a fit test must be conducted annually for each type of respirator used. Also, it must be conducted when the wearer loses or gains weight, or has a change that would affect how the respirator fits. Examples of such changes include facial surgery, facial scarring, or extensive dental work. Even if not required, this is a good strategy to follow.

Equipment Needed for Qualitative Fit Test

The fit test must be conducted with the model of the respirator that the subject will use. Refer to the pesticide labels of all products the subject will use to find out the type of respirator(s) required, and information that comes with the respirator(s) for appropriate uses. A number of models are available to fit the many shapes of heads and faces.

Equipment required to perform a fit test includes the following (those in *italics* can be purchased as a kit):

- a hood;
- at least 3 hand-operated *nebulizers* (*Figure 2*), labeled for the sensitivity test, the fit test, and a spare if any become clogged;
- *solutions (see below) for the sensitivity and fit tests;*
- equipment for mixing and measuring ml, (volume) and mg (weight) if preparing solutions;
- a table to place the equipment;
- the respirator(s) to be tested;
- a mirror so the subject can see and adjust the respirator;
- a fit test record form (sample provided on page 10);



Figure 2. A nebulizer converts solution from liquid to a mist as it is sprayed into a hood. UNL photo.

- a pen;
- a watch or device that shows seconds;
- disposable wipes;
- a prompting list of exercises the subject must perform while wearing the respirator and hood;
- the Rainbow Passage (bottom of page 10); and
- a closeable jug of water and drinking glasses.

Choices of solution include saccharin (sweet), Bitrex® (bitter), or isoamyl acetate (IAA, banana oil). Fit tests using Bitrex or saccharin use a hood; tests using IAA require a chamber, such as a 55-gallon drum liner. Because of the chamber, and because IAA breaks down quickly so solutions must be replaced frequently, most people use the sweet and bitter fit test methods. The IAA method will not be described in this publication. Another fit test method uses irritant smoke. The Safety Data Sheet for this testing material says, “The smoke can be irritating to the eyes, lungs, and nasal passages. The test conductor shall take precautions to minimize the test subject’s exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke.” Because of the potential for a reaction, and the need for good ventilation in the test area, the irritant smoke method is not described in this publication. For more information on fit tests using IAA or irritant smoke, see <http://www.OSHA.gov> and enter *fit test* in the search box.

All qualitative fit tests using Bitrex or saccharin solutions must be conducted with particulate filters (or cartridges with particulate filters, *Figure 3*) on the respirator. Once the test is over, use the appropriate filter for the protection needed—particulate filter, organic cartridge, etc. The IAA solution is not effective with particulate filters; it is used only to test respirators with organic vapor cartridges.



Figure 3. This full-face mask respirator has a particulate filter, suitable for the qualitative fit test using Bitrex or saccharin. UNL Photo.

Make a card with the Rainbow Passage for the subject to read, as the fit test includes speaking while wearing the respirator. Fit test kits with the hood, nebulizers, and pre-mixed solutions are available from companies such as 3M, Honeywell Safety, Grainger, Gemplers, and others. The pre-mixed solutions save time because you don’t have to measure ingredients to make the correct concentrations. Find these kits through an online search for *Respirator Fit Test Kit*.

Conduct the fit test in a room with good ventilation, and have a separate room or area for people waiting to be tested. Allow about 30 minutes for each fit test. In reality, each test will take from 20 to 40 minutes; the longer time is needed if the respirator doesn’t fit properly and another has to be selected and tested. Subjects should not eat or drink anything other than water for 15 minutes before the taste sensitivity screening and fit test. Otherwise, they may not be able to taste the solution, or tastes in the mouth could be confused with the testing solution.

General Overview of Fit Testing

1. Give the subject an overview of what will happen during the fit test using a saccharin or Bitrex solution. Explain that the fit test is to make sure the respirator is the right size and shape for the subject. If it doesn’t fit correctly, it will not protect the subject from inhaling pesticides while on the job.
2. Determine that the subject can detect the solution (saccharin or Bitrex) with a sensitivity test. If the subject can’t detect a particular solution, the fit test would be a waste of time. The subject will wear the hood without a respirator during the sensitivity test. You will be squeezing a sensitivity test solution spray into the hood to see if/when the subject can taste it.

3. After the sensitivity test determines that the subject can detect the solution, the subject will don (put on) the respirator with the particulate filter(s), adjust so it is comfortable, don any other PPE, such as eye protection, that will be worn that might affect use, and perform a seal check. This is a simple initial check to see that the respirator is positioned correctly. It is not a substitute for a fit test. If the subject cannot get a good seal, even after adjusting the respirator, have him/her select another respirator and conduct the seal check.
4. After the seal check shows that the subject has positioned the face mask properly, you will perform the fit test. The subject will don the fit test hood while wearing the respirator and any other PPE. Using the nebulizer, you will squeeze the fit test solution into the hood through the hole, and ask the subject to do some specific movements similar to what might occur during work (normal breathing, deep breathing, turning head from side to side, bending over, etc.), and read a paragraph. The subject will tell if/when s/he can taste the solution.
5. If the subject can taste the solution, choose another respirator and conduct the seal check and fit test again.
6. If the subject does not detect the solution, the test is over and the respirator is suitable. The fit test must be performed for each respirator the subject will be using.

Procedure for Sensitivity Test

First, find out if the subject can detect saccharin or Bitrex, and at what level (taste threshold) with a sensitivity test. Do this without the respirator. Subjects should not eat or drink anything besides water for 15 minutes prior to the test, as they may be unable to taste the solution, or tastes in the mouth could be confused with the testing solution.

We recommend doing sensitivity and fit tests with premixed solutions that are ready to use (Figure 4). Some kits may have the chemicals, but require you to make the solutions. The sensitivity test solution is much weaker than the fit test solution. Test kits with premixed solutions will have one marked as “Sensitivity Solution.” If yours aren’t marked, do so by marking the sensitivity solution and one nebulizer as “Sensitivity” to distinguish them from the fit test solution and the fit test nebulizer. Fill the sensitivity nebulizer with the sensitivity test solution. About 1 teaspoon of solution will be enough to test 10 people.

During a taste sensitivity test, as well as during fit testing, the subject wears an enclosure such as a hood (Figure 5) over the head and shoulders. It is about 12 inches in diameter and 14 inches tall, with at least the front portion clear. The hood must allow the subject to freely move his/her head while



Figure 4. Solutions are available that require no measuring for sensitivity or fit testing. UNL Photo.

wearing a respirator. The hood has a 3/4-inch hole that will be in front of the subject’s nose and mouth area. The nebulizer nozzle is inserted through the hole to spray solution into the hood.



Figure 5. A hood used for a fit test. UNL photo.

The following procedure uses saccharin to detect a sweet taste. As another option, use Bitrex to detect a bitter taste. The subject dons the hood without wearing the respirator. Throughout the sensitivity test, the subject breathes through his/her slightly open mouth with an extended tongue. Tell the subject to report when he/she detects a sweet taste. When the subject reports tasting the solution, ask the subject to remember that taste as a reference during the fit test.

Use the sensitivity nebulizer to spray the sensitivity solution into the hood, with about 1 ml of the liquid in the nebulizer body at a time. Direct the nozzle away from the nose and mouth of the subject. To produce fine droplets (the aerosol), firmly squeeze the nebulizer bulb so that it collapses completely, then release and allow it to fully expand.

Repeat 10 squeezes rapidly and then ask the subject whether s/he can taste the saccharin. If the subject reports tasting sweetness during those 10 squeezes, the screening test is completed. Circle 10 squeezes on the Fit Test Record; the taste threshold is 10 regardless of the number of squeezes actually completed.

If the subject doesn't detect a sweet taste, squeeze the nebulizer rapidly 10 more times and again ask if the subject tastes the saccharin. If the subject reports tasting sweetness during the second set of 10 squeezes, the screening test is completed. Circle 20 squeezes on the Fit Test Record; the taste threshold is 20 regardless of the number of squeezes actually completed.

If the subject still doesn't detect a sweet taste, squeeze the nebulizer rapidly 10 more times. Ask the subject for a third time if the saccharin is tasted. If the subject reports tasting sweetness during the third set of 10 squeezes, the sensitivity test is completed. Circle 30 squeezes on the Fit Test Record; the taste threshold is 30 regardless of the number of squeezes actually completed.

If the saccharin is not tasted after 30 squeezes, the subject cannot taste saccharin and may not perform the saccharin fit test. Use another solution, such as Bitrex.

Keep the nebulizer clean; thoroughly rinse it with water, and shake dry prior to refilling with solution at least each morning and afternoon, or every 4 hours.

Selecting a Respirator

Provide enough respirators so subjects can choose an acceptable model that fits correctly. Another option is to have subjects bring respirator(s) to be tested. Be sure they understand that they must be tested with the type of respirator(s) required by the pesticide label(s). In addition, they should understand that the particular size, model, or style of respirator(s) they brought with them may fail the fit test, and would not provide protection.

Once they choose a respirator, show them how to don it, position it on their face, set the strap tension, and make sure the fit is acceptable. This process is considered a review, **not** the required formal training. If subjects are not familiar with using a particular respirator, have them put it on and take it off several times so they can make the needed adjustments for a good fit.

Have a mirror for subjects to use when evaluating the position and fit (*Figure 6*). Have the subject look in the mirror as you check the following. They will be able to do this on their own in the future.

- Proper chin placement
- Adequate strap tension, not too tight
- Good fit across nose bridge
- Respirator of proper size to span distance from nose to chin
- Tendency of respirator to slip
- Room for eye protection, if needed
- Ability to talk



Figure 6. Have a mirror so the subject can see and learn about proper placement of the respirator. UNL photo.

Have the subject seat the mask by moving his/her head from side to side and up and down slowly while taking a few deep breaths. The subject should wear the respirator for at least 5 minutes to ensure it is comfortable. Then, have the subject do a seal check (see next section).

Perform a Seal Check with a Respirator

Whenever a respirator is to be worn, including for the fit test, the wearer should perform a seal check. This helps determine if the respirator has a tight seal or needs some adjustment. The subject should don any other equipment that is required, such as safety goggles or other eye protection. The wearer should put on prescription eyeglasses if needed, as some frames may prevent a good seal. The wearer must be clean shaven so the seal is not compromised. A beard, beard stubble, mustache, stray hairs, or even a low hairline could prevent the mask from making tight contact with the skin. This would allow unfiltered air to be inhaled. Do not conduct the fit test if the subject has any hair, including facial hair, between the skin and respirator (*Figure 7*). They must alter or remove any clothing or items that interfere with the seal.



Figure 7. Hair between the face mask and skin will prevent a proper seal. UNL photo.

The subject should place the respirator on his/her face, then pull the top (halo-shaped in some models) plastic strap and adjust it over and on top of the head. Next, connect the straps that go behind the neck, and pull the loose ends of the straps to adjust for comfort and fit. When the subject feels s/he has a tight seal, perform a seal check. Although only one is required, performing both the positive and negative seal check may be valuable training for the subject. The manufacturer of the respirator may have a recommended check method; this is also acceptable.

Positive Seal Check

To perform the positive seal check (*Figure 8*), the subject should cover the exhalation valve in front of the respirator and gently exhale. If the subject can do this without feeling a rush of air around the faceplate (sometimes called the face seal), s/he has a good seal.



Figure 8. Positive seal check. UNL photo.

Negative Seal Check

To perform the negative seal check (*Figure 9*), the subject covers the intake portion of each of the two cartridges with his/her hands and inhales gently. The subject can do this test without cartridges by simply covering the intake holes. If the seal is good, the subject should not be able to pull any air through the faceplate against his/her face.



Figure 9. Negative seal check. UNL photo.

If either the positive or negative check shows the seal is not good, check carefully around the faceplate for damages or obstructions. If the faceplate has breaks or damaged portions, replace the respirator. If the subject can clear obstructions and make additional adjustments to strengthen the faceplate, simply recheck the unit. In some cases, replace the respirator faceplate or the entire unit.

For a disposable particulate filter mask, don the mask. Some have a piece of metal along the nose bridge. Check the manufacturer's instructions for correct donning of a specific mask. In general, with both hands, press your fingertips on the metal band at the nosepiece. Press down while moving your fingers along the mask from your nose outward (*Figure 10*). This will mold the mask to fit your face.



Figure 10. Even disposable filter masks must be adjusted for a proper seal. UNL photo.

To check the seal (*Figure 11*), put both hands over the respirator completely and inhale sharply. You should feel the mask tighten against your face (negative pressure). If air leaks under the mask, adjust the nosepiece or straps. If you can't get a proper seal after repositioning the mask, try another style of respirator.



Figure 11. Seal check of a disposable particulate filter mask. UNL photo.

Procedure for the Saccharin Solution Fit Test

The subject must wear the selected respirator and whatever s/he would normally wear with the respirator that could interfere with the fit, such as eye protection or eyeglasses, for 5 minutes before the fit test. This is to make sure the respirator is comfortable. If the respirator is adjusted at any time during the fit test, you must start over. If you have to stop to unclog and wash a nebulizer, you must start over (that's why we suggest having a spare ready). If the fit test was paused, the concentration of the test solution in the hood might decrease, giving inaccurate results.

Some kits have the fit test solution already prepared. If you wish to mix your own saccharin sensitivity and fit test solutions, directions are available at <http://www.OSHA.gov>; search for *saccharin solution*. Look at the records to determine the number of squeezes used for the sensitivity test. The numbers will be 10, 20, or 30.

After successfully performing a seal check with the respirator and particulate filter(s) and wearing the respirator for at least 5 minutes, the subject dons the hood. Instruct the subject as before, to breathe through the slightly open mouth with tongue extended, and report if he/she tastes the sweet taste of saccharin.

Insert the nebulizer into the hole in the front of the hood and spray the saccharin fit test solution into the hood. Use the same number of squeezes (10, 20, or 30) that caused a taste response in the sensitivity test. This was circled on the Fit Test Record.

After spraying the solution, instruct the subject to perform the following exercises, each for 1 minute. Tell the subject to report if she/he tastes saccharin.

Every 30 seconds, you must replenish the aerosol concentration using one-half the original number of squeezes used initially (e.g., 5, 10, or 15).

1. Normal breathing. Ask the subject to stand in a normal standing position, and breathe normally without talking.
2. Deep breathing. Ask the subject to breathe slowly and deeply while still in a normal standing position, being careful not to hyperventilate.
3. Turn head side to side. Ask the subject to stand in place, and slowly turn his/her head from side to side and pause to inhale at each side.
4. Move head up and down. Ask the subject to stand in place and slowly move his/her head up and down. Inhale when looking toward the ceiling.
5. Talk. Ask the subject to speak slowly and loud enough so you can hear clearly. The subject can read from a prepared text such as the Rainbow Passage (below),

count backward from 100, or recite a memorized poem or song for 1 minute (Figure 12). Some people may have to be prompted to continue to talk.



Figure 12. The subject reads a passage while wearing the respirator and hood. In a work setting, the applicator may have to speak to someone while making an application, so it is important that the respirator has a tight seal when the applicator's mouth is moving. UNL photo.

Rainbow Passage: When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

6. Bend over. Ask the subject to bend at the waist as if he/she were going to touch his/her toes (Figure 13).



Figure 13. The subject should hold the bottom of the hood against his/her body while bending. UNL photo.

7. Normal breathing. End with normal breathing in standing position.

During the fit test: every 30 seconds, replenish the aerosol concentration with one-half the original number of squeezes used initially (e.g., 5, 10 or 15).

If the subject does not report tasting the saccharin after these seven exercises, the respirator fits and the test is completed.

If the subject tastes saccharin, the fit is unsatisfactory and the test failed. Select a different respirator, then go through the sensitivity test and fit testing again. At least 5 minutes must pass between taste screenings and fit testing so that odor sensitivity returns (the subject can detect the saccharin taste).

The nebulizer could clog during use, so make periodic checks of the nebulizer to ensure that it is working. If clogging is found at the end of the test session, the test is invalid. If you have to stop to unclog and wash the nebulizer, you will have to start the fit test over. Have another nebulizer handy in case of clogs.

After each fit test, clean the inside of the hood with a disposable wipe.

Procedure for the Bitrex Aerosol Fit Test

Bitrex is a taste aversion agent—it has a very bitter taste. Manufacturers add it to household liquids that children should not drink. Bitrex is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers. Follow the same procedure as for the Saccharin Aerosol Fit Test, except use Bitrex. You can purchase a kit with the solutions premixed and ready to use. If you wish to mix your own Bitrex sensitivity and fit test solutions, directions are available at <http://www.OSHA.gov>; search for *Bitrex solution*.

Follow the same procedures as for saccharin sensitivity and fit testing, using the appropriate Bitrex solutions.

When the Subject/Respirator Passes the Fit Test

Once all required respirators have been selected and passed the fit test, the subject must have training that covers:

1. Why the respirator is necessary;
2. How improper fit, usage, or maintenance can compromise the respirator;
3. The limitations and capabilities of the respirator;
4. How to use the respirator effectively in emergency situations, such as when the respirator malfunctions;

5. How to inspect, don, remove, use, and check the seals of the respirator;
6. How to maintain and store the respirator; and
7. Medical signs and symptoms of the wearer that may limit or prevent the effective use of respirators.

The subject should always conduct a seal test after donning a respirator. Training and the fit test must be conducted once a year; fit testing is required more often if the subject has a change in weight, dental work, or anything that might affect the seal; and if there is a change in the make, model, style, or size of the respirator facepiece. The fit test record must be kept on file for 2 years from the date it was conducted.

After the Fit Test

After each fit test, wipe the hood with a disposable wipe. Clean the equipment properly at the end of a session of fit tests. Thoroughly clean and rinse the nebulizers after use. Dry them with a fabric or paper towel. Clean the hood with a cloth dampened with mild soapy water, and rinse with clean water. You also may use a cloth dampened with water containing a small amount of mild disinfectant, but make sure to rinse thoroughly. Use a fabric or paper towel to dry the inside of the hood.

Discard unused solution; do not pour it back into bottles of stock solution. Make sure that caps on the bottles are tight, to prevent leaks. Saccharin crystals may form on the neck of the bottle if the cap is not tight.

Summary

Respirators provide protection only if they are in good condition, appropriate for the work, and fit the subject. The fit test is important to determine whether the respirator can provide protection. It may be required by the Worker Protection Standard, but is recommended for anyone who wears a respirator.

DISCLAIMER

Reference to commercial products or trade names is made with the understanding that no discrimination is intended of those not mentioned and no endorsement by Nebraska Extension is implied for those mentioned.

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RESOURCES

Centers for Disease Control and Prevention (CDC) links to NIOSH publications and other resources at <https://www.cdc.gov/niosh/topics/respirators/>

Environmental Protection Agency (EPA), *How to Comply with the 2015 Revised Worker Protection Standard for Agricultural Pesticides. What Owners and Employers Need to Know* at <https://www.epa.gov/sites/production/files/2016-10/documents/htcmanual-oct16.pdf>

Occupational Safety and Health Administration (OSHA) training videos, and other resources at <https://www.osha.gov/SLTC/respiratoryprotection/>



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Fit Test Record

Date:

Employee name:

Job/Classification:

Farm/Company:

Fit test method (*Circle one*):

Qualitative saccharin

Qualitative Bitrex

Qualitative IAA

(for either of these, the respirator
must have particulate filters)

(respirator must have
organic vapor cartridges)

Sensitivity Test Results to Determine Taste Threshold (*Circle one*):

10 squeezes

20 squeezes

30 squeezes

½ to be administered every 30 seconds during Fit Test Exercises (*Circle one*):

5 squeezes

10 squeezes

15 squeezes

Type of respirator	Make/model/size (Must include all three)	Fit factor/results (Circle one)	
		Pass	Fail
		Pass	Fail
		Pass	Fail
		Pass	Fail

Person conducting the fit test:

Problems the employee encountered with respirator:

Fit Test Exercises

- (1) Normal breathing. Stand and breathe normally without talking for 1 minute.
 - (2) Deep breathing. In a normal standing position, breathe slowly and deeply 1 minute, being careful not to hyperventilate.
 - (3) Turn head side to side for 1 minute. Stand in place, and slowly turn your head from side to side and pause to inhale at each side.
 - (4) Move head up and down for 1 minute. Stand in place and slowly move your head up and down. Inhale in the up position (when looking toward the ceiling).
 - (5) Talk. Speak slowly and loud enough so the test person can hear you. Read the following:
Rainbow Passage: When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.
 - (6) Bend over for 1 minute. Bend at the waist as if you were going to touch your toes.
 - (7) Normal breathing. End with normal breathing in standing position for 1 minute.
- If you ever taste the sweetness or bitterness, signal the test person.