**Appendix D**

 **Qualitative Fit Test Procedure**

**Equipment:**

**Hood & Collar** (Note: some fit test kits are designed to use only the hood, not with a collar. Adapt instructions as necessary)

**Fit Test Solution** (Saccharin or Bitrex – whichever is used above.)

**Sensitivity Solution** (Saccharin or Bitrex)

**Nebulizer #1** (Sensitivity)

**Nebulizer #2** (Fit Test)

**N 95 Respirators** – selection of several

**Timer/clock**

**Water and drinking glasses**

**Mirror**

**Preparation:**

1. Attach hood to collar by placing drawstring between flanges on collar. Tighten drawstring and tie with square knot or bow. (For equipment without a collar, follow manufacturer’s instructions)
2. Pour a small amount (approximately one teaspoon) of Sensitivity Solution (solution #1) into nebulizer #1.
3. Pour a small amount (approximately one teaspoon) of Fit Test Solution (solution #2) into nebulizer #2.
4. Immediately recap the bottles.
5. Change solution every 4 hours; discard at end of day or after last testing procedure.
6. Attach hood to collar by placing drawstring between flanges on collar. Tighten drawstring and tie with square knot or bow. (For equipment without a collar, follow manufacturer’s instructions)
7. Pour a small amount (approximately one teaspoon) of Sensitivity Solution (solution #1) into nebulizer #1.
8. Pour a small amount (approximately one teaspoon) of Fit Test Solution (solution #2) into nebulizer #2.
9. Immediately recap the bottles.
10. Change solution every 4 hours; discard at end of day or after last testing procedure

**Sensitivity test**

This test is done to assure that the person being fit tested can detect either the sweet or the bitter taste of the test solution at very low levels. The Sensitivity Test Solution is a very dilute version of the Fit Test Solution. **The test subject should not eat, drink (except water), or chew gum for 15 minutes before the test.**

1. Have the test subject put on the hood and collar assembly without a respirator.

2. Position the hood assembly forward so that there is about six inches between the subject’s face and the hood window.

3. Instruct the test subject to breathe through his/her mouth with tongue extended.

4. Using **Nebulizer #1 with the Sensitivity Test Solution (#1),** inject the aerosol into the hood through the hole in the hood window**.**

* **Inject ten squeezes** of the bulb, fully collapsing and allowing the bulb to expand fully on each squeeze.
* Both plugs on the nebulizer must be removed from the openings during use.
* The nebulizer must be held in an upright position to ensure aerosol generation.

5. Ask the test subject if he/she can detect the sweet or bitter taste of the solution. If tasted, **note the number of squeezes as 10** and proceed to the Fit Test.

If not tasted, inject an additional ten squeezes of the aerosol into the hood. Repeat with ten more squeezes if necessary. Note whether 20 or 30 squeezes produced a taste response.

7. **If 30 squeezes are inadequate, in that the subject does not detect the sweet or bitter taste, the test is ended. Another type of fit test must be used.**

8. Remove the test hood, and give the subject a few minutes to clear the taste from his/her mouth. It may be helpful to have the subject rinse his/her mouth with water.

 **Face piece Fit**

The individual shall be allowed to pick the most acceptable respirator from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

The individual shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine acceptable fit. A mirror may be helpful in assisting the individual in positioning of the respirator.

The respirator is donned as per manufacturer’s instructions.

Assessment of comfort and fit shall include a review of these points with the individual and allowing the individual adequate time to determine the comfort of the respirator:

* Position of the mask on the nose
* Room for eye protection
* Room to talk
* Position of mask on face and cheeks

These criteria shall be used to help determine the adequacy of the respirator fit:

* Chin properly placed
* Adequate strap tension, not overly tightened
* Fit across nose bridge
* Respirator of proper size to span distance from nose to chin

**User Seal Check**

The individual shall conduct a user seal check, using the procedure recommended by the respirator manufacturer. If the employee fails the user seal check, reposition and adjust the respirator and try again. If still unsuccessful, another mask shall be selected and a user seal check performed.

Remind employees that they must **perform a user seal check** to ensure that an adequate seal is achieved **each time the respirator is put on** using the respirator manufacturer's recommended user seal check method. User seal checks are not substitutes for fit tests.

**Reasons to Delay or Defer Fit Test**

The fit test shall not be conducted if there is any hair growth between the skin and the face piece sealing surface, such as stubble beard growth, beard, mustache or sideburns that cross the respirator sealing surface. Any type of apparel that interferes with a satisfactory fit shall be altered or removed.

If an individual exhibits breathing difficulty during the tests, he or she shall be referred to a physician or other licensed health-care professional, as appropriate, to determine whether the individual can wear a respirator while performing his or her duties.

If the individual finds the fit of the respirator unacceptable, he or she shall be given the opportunity to select a different respirator and be retested

**Perform the Fit Test:**

* Have the test subject don the respirator and perform a user seal check.
* Before beginning, describe the fit-test process, the exercises the employee will perform, and the individual's responsibility to immediately signal the instructor if they taste the fit test solution or have any physical distress during the test procedure.
* Have the subject put on and position the test hood as before, and breathe through his/her mouth with tongue extended.
* Using **Nebulizer #2 with Fit Test Solution (#2),** spray the fit test aerosol using the **same number of squeezes as required in the Sensitivity Test** (10, 20, or 30) for each exercise.
* A minimum of ten squeezes is required, fully collapsing and allowing the bulb to expand fully on each squeeze. The nebulizer must be held in an upright position to ensure aerosol generation.
* To maintain an adequate concentration of aerosol during this test**, inject one-half the number of squeezes** (5, 10, or 15) every 30 seconds for the duration of the fit test procedure.
* After the initial injection of aerosol, ask the test subject to perform the following test exercises for **60 seconds each**:
* **Normal breathing** — in a standing position, without talking, the subject shall breathe normally.
* **Deep breathing** — in a standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.
* **Turning head side to side** —Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.
* **Moving head up and down** —Standing in place, the subject shall slowly move his/her head up and down.
* **Talking** — the subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor.

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.

**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 looking for the pot of gold at the end of the rainbow.**

* **Bending Over** - The individual shall bend at the waist as if he or she were to touch his or her toes. Jogging in place can be substituted for this exercise in those tests environments such as shroud type QLFT units that do not permit bending over at the waist
* **Normal Breathing** - In a normal standing position, without talking, the individual shall breathe normally.

Each test exercise shall be performed for one minute. The individual shall be questioned by the test conductor regarding the comfort and fit of the respirator upon completion of the protocol. If it is unacceptable, another model of respirator shall be tried.

If the bulb of the nebulizer becomes difficult to squeeze or when you squeeze there is no visible mist released, check to be sure there is sufficient fit test solution and that the opening from the rubber bulb into the solution chamber is not clogged. Remove the small plastic piece and Insert the thin looped wire into the hole to unclog it. Also check the hole in the little plastic piece to be sure this is not clogged.

When the fit tests are complete, record the results. Make sure the employee knows the model and size of the respirator they were tested with. Advise the employees that should they need this information, they can contact \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to check the record.

If performing multiple fit-tests, clean nebulizer at least every 4 hours and when all fit-tests are completed. Use warm soapy water to clean the nebulizer and all its components, or soak all parts in 1 part white vinegar and 3 parts water. Soak for 15 minutes, rinse and allow them to air dry. Wipe the inside of the testing chamber with a disposable antiseptic pad as needed and when fit-tests are complete. Allow hood and nebulizers to dry thoroughly before storing.

All fit-testing must comply with the OSHA standard. The fit-test methods are outlined in Appendix A of 19 CFR 1910.134.

**Quantitative Fit testing – using Portacount**

Follow the manufacturer’s instructions for the Portacount. Saccharin and Bitrex are not used so there is no sensitivity testing needed and no spraying of aerosol.

The education components and user seal check instructions remain the same.

The fit test exercises are the same except that there is an additional exercise requiring the employee to grimace (and release) for 15 seconds. The Portacount will prompt the instructor as each exercise is due and tracks the time.

A probe is placed through the N95 respirator while the fit testing is done. The respirator must be discarded after the fit test is complete.

The Portacount will record the data on a computer which can then produce written report forms for each employee