

Standards of Practice

Respiratory Protection: Appendix B

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General Requirements:

- a. The employer shall conduct OSHA-accepted fit testing that maybe either QLFT or QNFT.
- b. The test subject 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.
- c. Prior to the selection process, the test subject 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 an acceptable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This instruction may not constitute the subject's formal training on respirator use, because it is only a review.
- d. The test subject shall be informed that he/she is being asked to select the respirator that provides the most acceptable fit. Each respirator represents a different size and shape, and will provide adequate protection if it is fitted and used properly.
- e. The test subject shall be instructed to hold each chosen face piece up to the face and eliminate those that obviously do not give an acceptable fit.
- f. The more acceptable face pieces are noted in case the one selected proves unacceptable. The most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in the following paragraphs g and h. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.
- g. Assessment of comfort shall include a review of the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:
 1. Position of the mask on the nose
 2. Room for eye protection
 3. Room to talk
 4. Position of the mask on face and cheeks
- h. The following criteria shall be used to help determine the adequacy of the respirator fit:
 1. Chin properly placed
 2. Adequate strap tension--not overly tightened
 3. Fit across nose bridge
 4. Respirator of proper size to span distance from nose to chin
 5. Tendency of respirator to slip
 6. Self-observation in mirror to evaluate fit and respirator position
- i. The test subject shall conduct a user seal check, either the negative and positive pressure seal checks described in [Appendix A](#), or those recommended by the respirator manufacturer, which provide equivalent protection to the procedures in Appendix A.

1. Before conducting the negative and positive pressure checks, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow, deep breaths.
 2. Another face piece shall be selected and retested if the test subject fails the user seal check tests.
- j. The 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.
 - k. If a test subject exhibits difficulty in breathing during the tests, he/she shall be referred to a physician or other licensed health care professional, as appropriate, to determine if the test subject can wear a respirator while performing his/her duties.
 - l. If the employee finds the fit of the respirator unacceptable, the test subject shall be given the opportunity to select a different respirator and to be retested.
 - m. Exercise Regimen: Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.
 - n. The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use that could interfere with respirator fit.
 - o. Test Exercises: The following test exercises are to be performed for all fit testing methods prescribed in this appendix. The test subject shall perform these exercises (in the test environment) in the following manner:
 1. Normal breathing: In a normal standing position, without talking, the subject shall breathe normally.
 2. Deep breathing: In a normal standing position, the subject shall breathe slowly and deeply taking caution so as to not hyperventilate.
 3. 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.
 4. Moving head up and down: Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).
 5. 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, 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 is looking for the pot of gold at the end of the rainbow.

6. Grimace: The test subject shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT.)
7. Bending over: The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud-type QNFT or QLFT units that do not permit bending over at the waist.
8. Normal breathing: Same as exercise #1
9. Each test exercise shall be performed for one minute except for the grimace exercise, which shall be performed for 15 seconds. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

PortaCount Plus™ Fit Test Requirements

1. Check the respirator to make sure the sampling probe and line are properly attached to the facepiece and that the respirator is fitted with a particulate filter capable of preventing significant penetration by the ambient particles used for the fit test (e.g., NIOSH 42 CFR 84 series 100, series 99, or series 95 particulate filter) per manufacturer's instruction.
2. Instruct the person to be tested to don the respirator for five minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the wearer to make certain the respirator is comfortable. This individual shall already have been trained on how to wear the respirator properly.
3. Check the following conditions for 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;

Tendency of the respirator to slip;

Self-observation in a mirror to evaluate fit and respirator position.

4. Have the person wearing the respirator to do a user seal check. If leakage is detected, determine the cause. If leakage is from a poorly fitting face piece, try another size of the same model respirator or another model of respirator.
5. Follow the manufacturer's instructions for operating the PortaCount and proceed with the test.
6. The test subject shall be instructed to perform the exercises in this appendix.
7. After the test exercises, the test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried.
8. **PortaCount Test Instrument**
 1. The PortaCount will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The Pass or Fail message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.
 2. Since the pass or fail criterion of the PortaCount is user programmable, the test operator shall ensure that the pass or fail criterion meet the requirements for minimum respirator performance listed in this Appendix.

3. A record of the test needs to be kept on file, assuming the fit test was successful. The record must contain the test subject's name, overall fit factor, make, model, style and size of respirator used, and the date tested.

Qualitative Fit Test (QLFT) Irritant Smoke (Stannic Chloride) or banana oil (Isoamyl Acetate) Protocol

a. General QLFT Requirements

1. The employer shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and ensure that test equipment is in proper working order.
2. The employer shall ensure that QLFT equipment is kept clean and well maintained so as to operate within the parameters for which it was designed.
3. This qualitative fit test uses a person's response to the irritating chemicals released in the "smoke" produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.

b. General Requirements and Precautions for Irritant Smoke QLFT

1. The respirator to be tested shall be equipped with high efficiency particulate air (HEPA) or P100 series filter(s).
2. Only stannic chloride smoke tubes shall be used for this protocol.
3. No form of test enclosure or hood for the test subject shall be used.
4. 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. Care shall be taken when performing the sensitivity screening checks that determine whether the test subject can detect irritant smoke to use only the minimum amount of smoke necessary to elicit a response from the test subject.
5. The fit test shall be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test or the build-up of irritant smoke in the general atmosphere.

c. Sensitivity Screening Check. The person to be tested must demonstrate his or her ability to detect a weak concentration of the irritant smoke.

1. The test operator shall break both ends of a ventilation smoke tube containing stannic chloride and attach one end of the smoke tube to a low-flow air pump set to deliver 200 milliliters per minute, or an aspirator squeeze bulb. The test operator shall cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.
2. The test operator shall advise the test subject that the smoke can be irritating to the eyes, lungs and nasal passages and instruct the subject to keep his/her eyes closed while the test is performed.
3. The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties and to determine if he/she can detect the irritating properties of the smoke. The test operator shall carefully direct a small amount of the irritant smoke in the test subject's direction to determine that he/she can detect it.

d. Irritant Smoke/Banana Oil Fit Test Procedure

1. The person being fit tested shall don the respirator without assistance and perform the required user seal check(s).
2. The test subject shall be instructed to keep his/her eyes closed.

3. The test operator shall direct the stream of irritant smoke/banana oil toward the face seal area of the test subject, using the low-flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the face piece and move the smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator.
4. If the person being tested has not had an involuntary response and/or detected the irritant smoke/banana oil, proceed with the test exercises.
5. The exercises identified in this appendix shall be performed by the test subject while the respirator seal is being continually challenged by the smoke being directed around the perimeter of the respirator at a distance of six inches.
6. If the person being fit tested reports detecting the irritant smoke/banana oil at any time, the test is failed. The person being retested must repeat the entire sensitivity check and fit test procedure.
7. Each test subject passing the irritant smoke/banana oil test without evidence of a response shall be given a second sensitivity screening check with the smoke from the same smoke tube used during the fit test (once the respirator has been removed) to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.
8. If a response is produced during the second sensitivity check, then the fit test is passed.

Appendix A	Appendix B	Appendix C	Appendix D	Appendix E
User Seal Check Instructions (Fit Check)	Fit Test Procedures for Tight-Fitting Respirator Masks	Definition of Terms	OSHA Respirator Voluntary Use	OSHA Medical Surveillance Questionnaire

Revision Log			
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