

APPENDIX A

Fit-testing Procedures

Take from:

Appendix A to §1910.134: Fit Testing Procedures (Mandatory), 4/23/98

1. 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.
2. 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.
3. 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 if fitted and used properly, will provide adequate protection.
4. The test subject shall be instructed to hold each chosen facepiece up to the face and eliminate those that obviously do not give an acceptable fit.
5. The more acceptable facepiece 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 listed below. 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.
6. 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:
 - a) Position of the mask on the nose
 - b) Room for eye protection
 - c) Room to talk
 - d) Position of mask on face and cheeks
7. The following criteria shall be used to help determine the adequacy of the respirator fit:
 - a) Chin properly placed;
 - b) Adequate strap tension, not overly tightened;
 - c) Fit across nose-bridge;
 - d) Respirator of proper size to span distance from nose to chin;
 - e) Tendency of respirator to slip;
 - f) Self-observation in mirror to evaluate fit and respirator position.
8. The test subject shall conduct a user seal check. Both the negative and positive pressure seal checks. 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. Another facepiece shall be selected and retested if the test subject fails the user seal check tests.

9. The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface. Any type of apparel, which interferes with a satisfactory fit, shall be altered or removed.
10. If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the test subject can wear a respirator sealing surface. Any type of apparel, which interferes with a satisfactory fit, shall be altered or removed.
11. 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.
12. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.
13. Test Exercises.
 - a) The test subject shall perform 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 not to 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 loo, 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.
 - 7) Bending over. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place may be substituted for this exercise.
 - 8) Return to normal breathing.
 - b) 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.
14. Irritant Smoke (Stannic Chloride) Protocol

This qualitative fit test uses a person's response to the irritating chemicals released in the "smoke" produced by stannic chloride ventilation smoke tube to detect leakage into the respirator.

a) General Requirements and Precautions

- 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.

b) 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 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. An MSDS for the material will be explained to the test subject.
- 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 on the test subject's direction to determine that he/she can detect it.

c) Irritant Smoke 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 from the smoke tube toward the faceseal area of the test subject, using the squeeze bulb.
- 4) If the person being tested has not has an involuntary response and/or detected the irritant smoke, proceed with the test exercise.
- 5) The exercises shall be performed by the test subject while the respirator seal is being continually challenged by the smoke.
- 6) If the person being fit tested reports detecting the irritant smoke 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 test without evidence of a response (involuntary cough, irritation) 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 this second sensitivity check, then the fit test is passed.