

RESPIRATOR USER SEAL CHECK

Persons using tight-fitting respirators must perform a user seal check to ensure that an adequate seal is achieved each time the respirator is put on. Either the positive and negative pressure checks listed in this appendix, or the respirator manufacturer's recommended user seal check method must be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

I. Mask Positive and/or Negative Pressure Checks

A. Positive pressure check.

Close off the exhalation valve and exhale gently into the mask. The face fit is considered satisfactory if a slight positive pressure can be built up inside the mask without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

B. Negative pressure check.

Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the mask collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the mask remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

II. Manufacturer's Recommended User Seal Check Procedures

The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that the employer demonstrates that the manufacturer's procedures are equally effective.

PROCEDURES FOR CLEANING RESPIRATORS

A. Remove filters, cartridges, or canisters. Disassemble masks by removing speaking diaphragms, demand and pressure- demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.

B. Wash components in warm (43 ° C [110 ° F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.

C. Rinse components thoroughly in clean, warm, preferably running water. Drain.

D. (1) When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:

a. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of warm water; or,

b. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of warm water; or,

c. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

(2). Rinse components thoroughly in clean, warm, preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on masks may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.

E. Components should be hand-dried with a clean lint-free cloth or air-dried.

F. Reassemble mask, replacing filters, cartridges, and canisters where necessary.

G. Test the respirator to ensure that all components work properly.



RESPIRATORY PROTECTION FIT TESTING REQUIREMENTS AND PROCEDURES

Before an employee may be allowed to use any respirator with a negative or positive pressure tight-fitting mask, the employee must have a confidential medical examination completed and the examiners certificate on file. Employees must also be fit tested and trained in the use and care of their respirator. The employee must be fit tested with the same make, model, style, and size of respirator that will be used, this includes disposable particulate respirators when use is required by the employer.

This brochure is provided as a training aid for a qualitative fit test (QLFT) only.

The standard defines a qualitative fit test (QLFT) as "a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent." If the individual detects the test agent at any time during the test, the subject fails the test. A QLFT, according to 29 CFR 1910.134(f)(6), "may only be used to fit test *negative pressure* air-purifying respirators that must achieve a fit factor of 100 or less."

WARNING

No respirator is capable of preventing all airborne contaminants from entering the wearer's breathing zone. Respirators help protect against certain airborne contaminants by reducing airborne contaminant concentrations in the breathing zone to below the TLV or other recommended exposure level. Misuse of respirators may result in overexposure to the contaminant and cause sickness or death.

FIT TESTING PROCEDURES

Within appendix A of the standard, the following four acceptable QLFT protocols are defined: Isoamyl Acetate (more commonly known as banana oil), Saccharin Solution Aerosol, Bitrex Solution Aerosol, and Irritant Smoke (Stannic Chloride).

The test method performed will dictate the type of air-purifying element that's used on the mask. The isoamyl acetate QLFT requires respirators equipped with organic vapor cartridges. Both the saccharin and bitrex QLFT require respirators equipped with particulate filters (either 95, 99 or 100 series filters are acceptable). To perform the irritant smoke test, the respirator needs to be equipped with either a P100 series particulate filter or HEPA filter.

Complete instructions for all QLFTs are detailed within appendix A to 29 CFR 1910.134.

ODFW's current testing procedure for *negative pressure* respirators will be to use the Irritant Smoke (Stannic Chloride) method with the appropriate filters installed on the mask.

Two methods are acceptable for fit testing a tight-fitting *positive pressure* mask:

1. The mask can be converted into a negative pressure respirator and equipped with filters appropriate to the fit test protocol being followed, or
2. An identical negative pressure respirator can be used as a surrogate for fit testing as long as it has the same sealing surfaces as the positive pressure respirator

TEST EXERCISES

The following test exercises are to be performed. Each test exercise shall be performed for one minute. 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. 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 (below), or count backward from 100.

(6) ***Jogging in place.** The test subject shall jog in place for a period of 1 minute. (*Required for exposure to Asbestos, Benzene, or Formaldehyde)

(7) **Normal breathing.** Same as exercise (1).

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.

FREQUENCY OF TESTING

29 CFR 1910.134(f)(2) states, "The employer shall ensure that an employee using a tight-fitting mask respirator is fit tested prior to initial use of the respirator, whenever a different respirator mask (size, style, model or make) is used, and at least annually thereafter." In addition, fit testing must be repeated "whenever the employee reports, or the employer, PLHCP (physician or other licensed healthcare professional), supervisor, or program administrator makes visual observations of changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight."

Also, an employee who has passed a fit test but later finds the fit of the respirator unacceptable must be given a reasonable opportunity to select a new mask and be retested.

RESPIRATOR CARTRIDGE CHANGE GUIDELINES

All air-purifying respirators used for protection against gases and vapors must have an end-of-service-life indicator (ESLI) or have a cartridge change schedule that is based on objective information or data to ensure that canisters or cartridges are changed before the end of their service life. The following change schedule is determined based on OSHA standards and manufacturer's recommendations.

Manufacturer's schedule should be consulted

Acrylonitrile: End of shift

Ammonia: Maximum 8 hours use total (up to 125 ppm)

Benzene: Beginning of shift

Butadiene: Every 1, 2, or 4 hours dependent on concentration (according to 29CFR1910.1051 Table 1), and at beginning of each shift

Formaldehyde: 3 hours or end of shift (whichever comes first)

HCl, SO₂, Chlorine: Maximum one shift

Methylene Chloride: No approved cartridges or canisters - must use supplied air

Nitric Acid: No approved cartridges or canisters - must use supplied air

Organic Vapors: Maximum 8 hours use total (up to 200 ppm)

Vinyl chloride: End of shift

All Cartridges for Emergency Use: Discard after use

HEPA filters: Restricted breathing or visibly dirty, wet, or compromised

Filtering dust masks: Visibly dirty/contaminated