

# Chapter 2 - Respiratory Protection Program

## General

This program has been written to define Oregon State University (OSU) rules regarding the use of respirators for personal protection against airborne contaminants. The ability for a respirator to provide adequate protection is based on proper selection, fit and training. Respirators which are intended for protection against harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors must not be obtained or worn by employees without approval from Environmental Health and Safety (EH&S) and in accordance with this program. This program is managed by EH&S and has been established to comply with the Oregon OSHA (OROSHA) regulations for respiratory protection. EH&S maintains a supply of different types of respirators. Respirators should be obtained through EH&S in order to ensure the proper selection and fit. Off campus facilities and other campus groups who have a large number of respirator users may obtain and fit test their own respirators after consultation with EH&S. At least annually, such groups should contact EH&S to discuss the efficacy of the program and any intended changes.

## Use of Respirators

Every employee that wears a respirator on the job, whether required to wear one or not, shall have it properly fitted prior to initial use and at all times while performing an operation in a hazardous atmosphere. No employee shall use or be assigned to a task that requires the use of a respirator, unless it has been determined that the employee is physically able to perform under such conditions. This process will begin with the completion of a medical questionnaire available from EH&S. This questionnaire has been developed by physicians at the Corvallis Clinic in accordance with OR-OSHA regulations. The employee returns the questionnaire directly to the Occupational Medicine group at the Corvallis Clinic where it will be reviewed. A physical will be conducted for those employees who indicate potential medical problems on the medical questionnaire. After review, the clinic notifies EH&S of the employee's physical ability to wear a respirator.

A review of the employee's health status must be made annually by returning another questionnaire to the Clinic for review. Off campus sites can use other avenues of medical review that are equivalent. The department is responsible for paying all fees associated with this medical evaluation process.

## **Selection**

The useful life of each respirator or cartridge will vary depending on the job duties and actual time in use. Each respirator has limitations; for details, refer to the manufacturer's instructions and recommendations. Air purifying respirators (disposable masks, half or full face cartridge respirators) will not be used in an environment that has less than 19.5% oxygen. To help determine which respirator is best suited for your operation, contact EH&S.

## **Training of Employees**

Each respirator user will be trained on how to use, check, and maintain respirators. This training will be provided by EH&S or by other groups in consultation with EH&S. The training of each respirator wearer will include the following:

1. The reasons for the need of the respiratory protection.
2. The nature, extent, and effects of respiratory hazards to which the person may be exposed.
3. Where applicable, an explanation of why engineering controls are not being applied or are not adequate and of what effort is being made to reduce or eliminate the need for respirators.
4. An explanation of why a particular type of respirator has been selected for a specific respiratory hazard.
5. An explanation of the operation, and the capabilities and limitations, of the respirator selected.
6. Instruction in inspecting, donning, checking the fit of, and wearing the respirator.
7. An opportunity for each respiratory wearer to handle the respirator and to wear the respirator in both a safe atmosphere and a test atmosphere for an adequate period of time to ensure that the wearer is familiar with the operational characteristics of the respirator.
8. An explanation of how maintenance and storage of the respirator is carried out.
9. Instructions in how to recognize and cope with emergency situations.
10. Instructions as needed for special respirator use.
11. Regulations concerning respirator use.

A record will be kept of those employees who have been trained. Each user must understand and be able to apply the contents of this respirator program in the daily use, care, and safekeeping of the respirators.

## Fitting of Respirators

Proper fitting of respirators is essential for employees to receive the protection for which the respirator is designed. Air, which passes around the face-piece of the respirator, rather than through it, is not filtered air. In order to ensure a good face seal, follow the manufacturer's fitting instructions and rules below:

1. The respirator and all straps should be in place and worn in the appropriate position. To adjust head bands, pull the free end tight until a comfortable and effective fit is obtained.
2. To adjust the face-piece properly, position chin firmly in the chin cup and manually shift rubber mask until the most comfortable position is located. Make final adjustments on the headband and do not break the nasal seal. Modifications to the respirator or straps will not be made.
3. BEARDS are not allowed. Respirators should not be worn when projections under the face piece prevent a good face seal. Note: Such conditions may be a growth of beard, sideburns, temple pieces on glasses, or a skull cap that projects under the face piece.
4. Respirators should not be worn if scars, hollow temples, excessively protruding cheekbones, deep creases in facial skin, the absence of teeth or dentures, or unusual facial configurations prevent a good face seal.
5. Each day, to ensure proper protection, the wearer of a respirator should check the seal of the face-piece by conducting both a positive and negative pressure test. Positive and negative pressure test will be conducted every time the respirator is put on and prior to each entry into a hazardous atmosphere.

### a. Positive Pressure Test

- Close off exhalation valve with palm.
- Exhale gently.
- A small build-up of positive pressure, with no outward leaks, indicates a good face-piece fit.
- If air leakage is detected, reposition the respirator on the face, readjust the tension of the head bands, or try a different size respirator.
- Repeat the test until a satisfactory seal has been achieved.

### b. Negative Pressure Test

- Cover aid inlets with palms (if a disposable, cover the entire filtering surface)
- Gently breathe in so that face-piece collapses slightly.
- Hold breath for 10 seconds.
- If respirator remains slightly collapsed and no inward leaks are felt, the face-piece fits tight enough.
- If air leakage is detected, reposition the respirator on the face, readjust the tension of the head bands, or try a different size respirator.
- Repeat the test until a satisfactory seal has been achieved.

## Initial Required Fit Test

A more elaborate fit test will be conducted by EH&S, or other approved groups as outlined in this document, for each employee when a new type of respirator is issued. The fitted respirator will be tested using the appropriate qualitative fit test. For example:

- a. Isoamyl Acetate Test (banana oil) can be used to check respirator fit when using organic vapor respirators by determining if the wearer can detect the "banana oil" odor.
- b. Irritant Fume Test can be used with particulate respirators to ensure proper fit.
- c. 3M Saccharin Test can be used to check disposable or half mask dust and mist respirators.

## Maintenance of Respirators

Respirators need to be maintained to ensure effectiveness and to prevent chemical and bacterial contamination. Proper maintenance of the respirator is the responsibility of each employee.

- Respirators issued for the exclusive use of one worker should be cleaned after each day's work, or more often if necessary.
- Respirators used by more than one worker should be thoroughly cleaned and disinfected after each use. Those respirators that are stored for emergency use should be thoroughly inspected at least once a month and after each use by the individual responsible for these respirators.

Respirator cleaning and disinfecting should be done by carrying out the following procedures:

1. Remove all covering assemblies before cleaning and disinfecting:
  - a. Filters, cartridges, canisters
  - b. Speaking diaphragms
  - c. Demand and pressure-demand valve assemblies
  - d. Head band
  - e. Any other components recommended by the respirator manufacturer
2. Wash respirator and appropriate covering assemblies as recommended by the manufacturer, in warm cleaner and disinfectant solution (49°C/120°F max. temp.). A soft cloth may be used to help remove dirt or other foreign material. A recommended disinfecting solution can be made from ordinary household bleach diluted 1:10 with clear water. A two-minute immersion will disinfect adequately.
3. Rinse respirator and appropriate covering assemblies in clean, warm water (49°C/120°F max. temp.).
4. Shake respirator as needed to remove water residues and any foreign materials that may still remain.
5. Inspect parts and replace any parts found defective. Set respirator aside to air dry.

6. When dry, reassemble respirator and attach new filters, cartridges or canisters if necessary.
7. Visually inspect and, where possible, test parts and respirator assemblies for proper function.
8. After respirator has been cleaned, dried, and inspected it should be stored in a sealed, clean, sanitary container (zip-lock bag), away from any source of contaminants. Respirators should not be hung on nails. The face-piece, inhalation and exhalation valves must be in a normal position so as to prevent the abnormal "set" of elastomer parts during storage.

## **Respirator Program Evaluation**

Periodic evaluation of the effectiveness of the respirator program is essential to ensure that persons are being provided with adequate respiratory protection. The effectiveness of the respirator program should be evaluated at least annually by supervisors and EH&S. Corrective action should be taken to correct defects found in the program. Supervisors will monitor the effectiveness of this program by:

- Frequent unscheduled observations of employee activities throughout the work area to confirm proper respirator use and acceptance by employees.
- Observation of and discussion with new employees to confirm proper training has been carried out.