

University  
*of* Portland



**RESPIRATORY PROTECTION PROGRAM**



**UNIVERSITY OF PORTLAND**

*PORTLAND, OREGON*



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## RESPIRATORY PROTECTION PROGRAM

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## RESPIRATORY PROTECTION PROGRAM

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## RESPIRATORY PROTECTION PROGRAM

### INTRODUCTION

When airborne contaminants may exist at University of Portland worksites and cannot be controlled to a level below occupational exposure limits, respirator PPE is used to protect employees.

A particular respiratory hazard that employees may be exposed to is airborne silica dust from working with both natural and manufactured products containing silica – the major source of silicosis, a serious and preventable disease. University of Portland takes every reasonable measure to prevent its personnel from exposure to silica dust and monitors their ongoing health for safety. (See the *University of Portland Respirable Crystalline Silica Program* for full details.)



Additionally, there are many variables that affect the degree of protection provided by respirators and the misuse of respirators can be hazardous to employee safety and health. Selection of the wrong equipment, respirators not properly maintained and improper fit can all degrade the effectiveness of a respirator. Respirators can provide adequate protection if they are properly selected for the task; are fitted to the wearer and are consistently worn properly; and are properly maintained.

### 1.0 PURPOSE

Employees at University of Portland can be exposed to respiratory hazards. The purpose of this program is to assure employees protect themselves from exposure to these hazards and, in particular, hazards associated with airborne silica dust.

Engineering controls, such as ventilation and substitution of less toxic materials, are the first line of defense. In situations where engineering controls have not controlled the identified hazards, respiratory protection is used. Respiratory protection may also be worn voluntarily with approval of the Respiratory Program Coordinator and the employee supervisor.

### 2.0 SCOPE AND APPLICATION

This program applies to all employees who choose or are mandated to wear respirators. There is no cost to employees to participate. The expenses associated with any medical evaluations, training and respiratory protection equipment are paid for by University of Portland.

#### Voluntary use of respirator protection equipment:



Employees who voluntarily choose to use a cartridge style respirator when the respirator is not required **ARE SUBJECT** to this program. These individuals will receive a medical evaluation as well as training covering proper procedures for cleaning, maintenance and storage of their respirators.



Employees who voluntarily choose to use a filtering face-piece respirator (i.e., a dust mask style respirator) are **EXCLUDED** from the requirements of this program.

Employees are **PROHIBITED** from using Air Supply System type (SAR or SCBA) respiratory equipment on a voluntary basis.



### 3.0 RESPONSIBILITIES AND POLICY

It is the policy of University of Portland to maintain its working environments in manners that will not adversely affect the health, safety, and well-being of employees. All activities involving the use of respiratory protection equipment controlled by University of Portland are conducted in compliance with federal and state OSHA.

#### Administration

The **Respiratory Program Coordinator** is responsible for overseeing the respiratory protection program and will conduct the required evaluations of program effectiveness. Duties include:

- ◆ Identifying work areas, processes or tasks that require workers to wear respirator.
- ◆ Evaluating respiratory related hazards and selecting respiratory protection options.
- ◆ Monitoring respirator use to ensure that respirators are used in accordance with certifications.
- ◆ Arranging for and/or conducting training including conducting fit testing.
- ◆ Teaching proper storage and maintenance of respiratory protection equipment.
- ◆ Administering the medical surveillance program and maintaining records required by the program.
- ◆ Evaluating and updating the written program as necessary for changes that affect respirator use.

#### Supervision

Supervisors and department heads are responsible for monitoring the respiratory protection program in their particular areas and locations. In addition to being knowledgeable about the program requirements for their own protection, these managers must also ensure that the program is understood and followed by the employees under their charge. These duties include:

- ◆ Ensuring that employees under their supervision (including new hires) have received appropriate medical evaluation, training, and fit testing.
- ◆ Ensuring the availability of appropriate respirators and accessories.
- ◆ Awareness of tasks requiring the use of respiratory protection.
- ◆ Enforcing the proper use of respiratory protection when necessary.
- ◆ Ensuring that respirators are properly cleaned, maintained, and stored according to the respiratory protection plan.
- ◆ Ensuring that respirators fit well and do not cause discomfort.
- ◆ Continually monitoring work areas and operations to identify changes in respiratory hazards.
- ◆ Coordinating with Respiratory Program Coordinator to assess and analyze respiratory hazards or other concerns regarding the program.

#### Employees

Each employee has the responsibility to wear his or her respirator when and where required and in the manner in which they were trained. Employees must:

- ◆ Care for and maintain their respirators as instructed and store them in a sanitary location.
- ◆ Use only those brands and types of respirators for which they have been trained and fit tested by Respiratory Program Coordinator.
- ◆ Inform their supervisor or the Respiratory Program Coordinator if the respirator no longer fits well and request a new one that fits properly.
- ◆ Inform their supervisor or the Respiratory Program Coordinator of any respiratory hazards that they feel are not adequately addressed in the workplace and of any other concerns about the program or using their respirator.



#### 4.0 RESPIRATOR SELECTION

The Respiratory Program Coordinator is responsible for ensuring that the respirator(s) selected will be adequate to effectively reduce exposure to the respirator user under all specified conditions of use.

##### Evaluating Respiratory Hazards

The Immediate Supervisor will select respirators to be used based on the hazards to which persons are exposed to at University of Portland and in accordance with all State OSHA standards. The Respiratory Program Coordinator conducts a hazard evaluation for each operation, process, or work area where airborne contaminants may be present in routine/non-routine operations or in emergencies.

##### Hazard Evaluation Update

The Immediate Supervisor is responsible for revising and updating hazard evaluations as needed (i.e., any time work process changes may potentially affect employee exposure). If an employee feels that respiratory protection is needed during a particular activity, they should contact the Respiratory Program Coordinator who will evaluate the potential hazard. The Respiratory Program Coordinator will then communicate the results of that assessment back to the affected employees. If it is determined that respiratory protection is necessary, all other elements of this program will be in effect for those tasks and this program will be updated accordingly.

##### Workplace and User Factors

The Immediate Supervisor will ensure that respirators selected will not impair the worker's vision, hearing, communication, and physical movement necessary to perform jobs safely.

##### NIOSH Certification

All respirators must be certified by the National Institute for Occupational Safety and Health (NIOSH) and shall be used in accordance with the terms of that certification. All filters and cartridges must be labeled with the appropriate NIOSH approval label.



#### 5.0 MEDICAL EVALUATION

Employees assigned to tasks where respirators are used, including voluntary use, must be physically able to perform the work while using the respirator. University of Portland has the responsibility of ensuring that employees are medically fit and able to tolerate the physical and psychological stress imposed by respirator use. Employees will not be allowed to wear respirators until a physician or other licensed health care professional has determined that they are medically able to do so.



**Any employee refusing the medical evaluation may not work using a respirator.**

Employees voluntarily using dust masks are exempt from the requirements of the medical evaluation program, if that is the only respirator used.

##### Medical Questionnaire Administration

Employees using respirators are required to complete the Respirator Medical Evaluation Questionnaire (see appendix). The Respiratory Program Coordinator will make available a copy of the questionnaire to all employees requiring medical evaluations. The medical evaluation will be administered confidentially and during working hours at a place on site that is convenient to employees. When completed, the questionnaire should be sent directly to University of Portland's chosen occupational health clinic vendor. The Respiratory Program Coordinator will not review completed questions and there will be no employee/employer interaction that could be considered a breach of confidentiality.

Subsequent to completion of the medical questionnaire, *Human Resources* will coordinate follow-up physical exams for employees. All records from medical evaluations, including completed questionnaires, will remain *confidential* between the employee and the clinic.

### Written Recommendations

University of Portland will obtain a written recommendation from the clinic on whether/or not an employee is medically able to wear a respirator. The recommendation must identify any limitations on the employee's use of the respirator, as well as the need for periodic or future medical evaluations that are required by University of Portland' occupational health clinic vendor. Information concerning employee diagnosis, test results, or other *confidential* medical information will not be disclosed to University of Portland.

### Re-Evaluations and Additional Medical Evaluations

University of Portland has the responsibility of ensuring that employees are medically fit and able to tolerate the physical and psychological stress imposed by respirator use. University of Portland arranges for additional medical evaluation or re-evaluation for any employee when:

- ◆ An employee reports medical signs or symptoms that are related to the ability to use a respirator.
- ◆ A clinician, supervisor, or the Immediate Supervisor observes that the employee is having a medical problem during fit testing or workplace respirator use.
- ◆ Information from the respiratory protection program, including observations made during fit testing and program evaluation, indicate a need for employee re-evaluation.
- ◆ A change occurs in workplace conditions (e.g., physical work effort, type of respirator used, protective clothing, or temperature) that may result in a substantial increase in the physiological burden placed on an employee.
- ◆ A health-care professional deem it appropriate.

The content of additional medical evaluations will be determined by University of Portland' occupational health vendor.

## 6.0 FIT TESTING

Fit testing will be required for all respirators, except dust masks. Fit testing will be performed:

- ◆ After an employee has completed a medical evaluation and prior to being allowed to wear any respirator with a tight fitting face-piece in the work environment.
- ◆ Whenever a different respirator face-piece is used.
- ◆ At least annually thereafter.
- ◆ When there are changes in the employee's physical condition that could affect respiratory fit (e.g., obvious change in body weight, facial scarring, etc.)



Employees will be fit tested with the make, model, and size of respirator that they will actually wear. If for any reason an employee finds that the respirator fit is unacceptable, a reasonable opportunity to select a different face-piece and to be retested will be provided.

**Note:** University of Portland is responsible for assuring the safety of all employees using respirators. As such, after being notified by University of Portland of an incompatible respirator fit issue, employees with features that impede proper respirator fit (e.g. facial hair) will be instructed to make all changes necessary to ensure proper respirator fit. Employees declining to make all instructed changes may be reassigned to other work, or have their employment terminated for failure to comply with mandatory safety rules.

**Fit Testing Procedure (see Appendix C for detailed information)**

Qualitative fit tests may be conducted on all negative pressure respirators. If conditions affecting exposure levels change, the Respiratory Program Coordinator will evaluate whether fit testing changes are required.

While a fit test is in progress, the respirator must not be adjusted.

Employees will perform fit test exercises in the test environment while wearing all other safety equipment that will be worn during actual respirator use and that could interfere with respirator fit.

If the employee exhibits breathing difficulty during the fit test, they will be referred to University of Portland' occupational health clinic vendor to determine if a respirator can be worn while performing the job duties.

- (a) Negative pressure check: Close off the inlets of the cartridge with the palm of the hand or other item or remove the cartridges and cover the holes.
- (b) Inhale gently so that a vacuum occurs within the facepiece. Hold the breath for 5 to 10 seconds. If the vacuum remains, the respirator fits properly.



*Negative Pressure Check*

**7.0 RESPIRATOR USE**

The employee's immediate Supervisor, in collaboration with managers and supervisors, will monitor the work area where employees are using respirators to be aware of changing conditions.

**Facepiece Seal Protection**

University of Portland does not permit respirators with face-pieces to be worn by employees who have conditions that would compromise the face-piece-to-face seal. Examples of these conditions include facial hair (e.g., beard stubble, bangs) that interferes with the face-piece seal or valve function, absence of normally worn dentures, facial deformities (e.g., scars, deep skin creases, prominent cheekbones), or the use of jewelry or headgear that projects under the face-piece seal.

Corrective glasses or goggles, or other personal protective equipment, must be worn in such a way that they do not interfere with the seal of the face-piece to the face. A user fit check will be performed every time a respirator is put on or adjusted to ensure proper seating of the respirator to the face.

**8.0 MONITORING RESPIRATOR EFFECTIVENESS**

The Respiratory Program Coordinator and supervisors are responsible for maintaining appropriate surveillance of changes in work area conditions that may increase employee exposure or stress. Employees should leave the respirator use area to wash their faces and respirator face-pieces as needed to prevent skin or eye irritation associated with respirator use. Whenever the respirator user can detect vapor or gas breakthrough (by odor, taste, and/or irritation effects), a change in breathing resistance or leakage of the face-piece, the employee should leave the respirator use area to replace the respirator or its filter.

Employees should to leave the respirator use area if the respirator is not properly functioning and must be replaced, repaired, or discarded. The employee should not return to the respirator use area until the respirator has been replaced or repaired.

Employees must leave the respirator use area if they experience severe discomfort in wearing the respirator or if they experience sensations of dizziness, nausea, weakness, breathing difficulty, coughing, sneezing, vomiting, fever, and chills.



## 9.0 MAINTENANCE AND CARE

The Respiratory Program Coordinator will oversee the maintenance and care program.

### Cleaning and Disinfecting

Respirators will be cleaned and disinfected by individual users using the respirator manufacturer's cleaning procedures. Respirators will be cleaned and disinfected as follows:

- Respirators that are issued for the exclusive use of an employee will be cleaned and disinfected as often as necessary to be maintained in a sanitary condition. Employees will be responsible to clean and disinfect respirators issued for their exclusive use.
- Respirators used by more than one employee will be cleaned and disinfected prior to being used by a different individual. (This practice is discouraged)
- During fit-tests, disinfectant wipes can be used in between respirator wears to minimize the risk for spreading illness. After testing, each respirator will be completely disassembled and cleaned.



### Storage

Respirators will be stored so that they are protected against damage, contamination, dust, sunlight, temperature extremes, excessive moisture, and damaging chemicals. When respirators are packed or stored, the face-piece and exhalation valve will be stored in a manner that prevents deformation. Each respirator should be positioned so that it retains its natural configuration.

### Inspection

Respirators are inspected before each use and during cleaning and include a check of respirator function, tightness of connections, and condition of the various parts including but not limited to: the face-piece, head straps, valves, and filters. The elastic parts must be evaluated for pliability and signs of deterioration.

### Repair

The Respiratory Program Coordinator will ensure that respirators that fail to pass inspection or are otherwise found to be defective will be removed from service and repaired or adjusted properly. If a respirator cannot be repaired or adjusted it must be discarded.

## 10.0 TRAINING AND INFORMATION

University of Portland will provide training to respirator users, supervisors, and any person issuing respirators on the contents of the Respiratory Protection Program and their responsibilities under it, and on the State OSHA respiratory protection standard.

Employees will be trained prior to using a respirator in the workplace. Supervisors will be trained prior to using a respirator in the workplace or prior to supervising employees who wear respirators.

Employees who *voluntarily* use filtering dust mask respirators are exempt from the training requirements.

## 11.0 RESPIRATORY PROTECTION TRAINING GUIDELINES

The Respiratory Protection Training course materials will cover the following information:

- ◆ Information regarding the consequences of improper fit, usage, or maintenance on respirator effectiveness will be provided to employees, all of which are critical to ensure employee protection.
- ◆ Employees will be provided an explanation of the limitations and capabilities of the respirator selected for use. A discussion of the limitations and capabilities of the respirator will address how the respirator operates. Training will include an explanation of how the respirator provides protection by either filtering the air, absorbing the vapor or gas, or providing clean air from an uncontaminated source, as applicable. Training will include limitations on the use of the equipment.



- ◆ Training will include the procedures for inspecting the respirator, donning and removing it, checking the fit and respirator seal, and wearing the respirator. Employees will be capable of recognizing any problems that may threaten the continued protective capability of the respirator. The training will include the steps employees are to follow if they discover any problems during inspection, how the problems are to be reported, and where they can obtain replacement equipment.
- ◆ Instructions will be given to respirator users about the proper procedures for maintenance and storage.
- ◆ Employees will be provided with medical information that is sufficient for them to recognize the signs and symptoms of medical conditions (e.g., shortness of breath, dizziness) that may limit or prevent the effective use of respirators.
- ◆ Employees will be informed of the general requirements of the respiratory protection standards. This discussion will inform employees that employers are obligated to develop a written program, properly select respirators, evaluate respirator use and correct deficiencies in use, conduct medical evaluations, provide for the maintenance, storage, and cleaning of respirators, and retain and provide access to specific records.
- ◆ Employees will demonstrate their understanding of the information covered in the training through hands-on exercises. The Respiratory Program Coordinator will document respirator training and the documentation will include the type, model, and size of respirator for which each employee has been trained and fit tested.

### Frequency of Training

New employees will be provided respirator training prior to using a respirator in the workplace. **Employees will be retrained annually and more often as needed.** Retraining will occur if the Respiratory Program Coordinator or Supervisor determines that any employee has not retained or demonstrated the knowledge, understanding, or skill level required for using the respirator.

## WARNING



**Disposable paper and fiber dust masks DO NOT protect from the dangerous silica dust that causes silicosis. When source controls cannot keep exposures below the silica REL, use of fitted particulate respirators with N95 or better filters for airborne exposures to crystal- line silica is mandatory.**



### Toxic Atmospheres

In emergency situations where an atmosphere exists in which the respirator user could be overcome by a toxic or oxygen-deficient atmosphere, the following procedures **must be observed**: (Note: all specific guidelines and requirements concerning confined space entry **must also be followed**.)

1. Never enter a dangerous atmosphere without first obtaining the proper personal protective equipment and air monitoring equipment. Next, obtain permission to enter from the Safety Office if a confined space entry is involved.
2. Never enter a dangerous atmosphere without at least one other rescue-trained person present.
3. Communications (voice, visual, or signal line) must be maintained between all persons present.
4. Persons remaining in the safe area must have the proper rescue equipment to enable them to aid the person in the dangerous atmosphere if problems are encountered. For example, if airline respirators are used for entry, SCBAs must be used for rescue.

## Procedures for IDLH (Immediately Dangerous to Life and Health) Atmospheres

**For all IDLH atmospheres: University of Portland does not permit employees to enter IDLH atmospheres under any circumstances.**

## 12.0 PROGRAM EVALUATION

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The Respiratory Program Coordinator (EHS) is responsible for conducting evaluations of the workplace, as necessary, to ensure that the provisions of the respiratory protection program are being implemented for all employees using respirators. Evaluations are also conducted to ensure the continued effectiveness of the program.

Supervisors are responsible to monitor employee use of respirators to ensure that they are being used and worn properly.

The Respiratory Program Coordinator (EHS) will regularly consult with employees wearing respirators to determine the employees' views on program effectiveness and to identify any problems so that corrective action can be taken. Correcting any problems associated with wearing a respirator that are identified by employees or that are revealed during any other part of this evaluation will be the responsibility of the Respiratory Program Coordinator and of management.

## 13.0 RECORDKEEPING

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University of Portland will only retain a copy of the Occupational Health Clinic's written recommendation for each employee subject to medical evaluation. Each employee's completed medical questionnaire, results of relevant medical tests, examinations, and diagnosis, etc., will be maintained by the clinic for 30 years.

The Respiratory Program Coordinator will retain fit test records for respirator users until the next fit test is administered. Respiratory Program Coordinator will retain employee-training records that include the names of employees trained and the dates when training was conducted.

University of Portland will maintain a written copy of its respiratory protection program. All written materials required to be maintained under the record keeping requirements will be made available, upon request, to the employee who is the subject of the records.

## 14.0 VOLUNTARY USE OF RESPIRATORS

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University of Portland may provide respirators at the request of employees, if the Immediate Supervisor determines that such respirator use will not in itself create a hazard. If the Respiratory Program Coordinator determines that any voluntary respirator use is permissible, University of Portland provides the respirator users with the information in Appendix D.

**RESPIRATOR TRAINING RECORD**

**Required Areas For Discussion:**

- The sources and hazards of airborne silica dust.
- Preventing and protection from hazardous exposures to airborne silica dust.
- The reasons for using a respirator and the impact of improper fit, usage, and maintenance.
- The limitations and capabilities of the selected respirator, including chemical cartridges.
- The procedure to follow if the respirator malfunctions.
- The proper inspection, donning, doffing, and fit checking of the selected respirator.
- The proper maintenance and storage procedures for the selected respirator.
- The recognition of medical signs and symptoms that may limit or prevent effective use of the respirator.
- The general requirements of the Respiratory Protection Program at University of Portland.



**Employee's Statement: The above items have been discussed with me. I understand how the respirator operates, provides protection, and the limitations. I understand the instructions relevant to use, cleaning, and disinfecting the respiratory device(s) I will use.**

<b>Employee Name (please print)</b>
<b>Signature</b>
<b>Date</b>

Comments:

\_\_\_\_\_  
\_\_\_\_\_

<b>Trainer Name (please print)</b>
<b>Signature</b>
<b>Date</b>

*Copies kept in employee file*

## APPENDIX A

**RESPIRATOR CLEANING PROCEDURES**

To Comply with §1910.134 – Respirator Cleaning Procedures (Mandatory)

**Introduction**

These procedures are provided for employer use when cleaning respirators. They are general in nature, and as an alternative, employees may use the cleaning recommendations provided by the manufacturer of the respirators they use, provided such procedures are as effective as those listed here in Appendix A. Equivalent effectiveness simply means that the procedures used must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user.

**Cleaning Procedures**

- 1) Procedures for Cleaning Respirators
  - a) Remove filters, cartridges, or canisters. Disassemble facepieces 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 degrees C. [110 degrees 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 (43 degrees C. [110 degrees F.] maximum), preferably running water. Drain.
  - d) When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for 2 minutes in one of the following:
    - i) Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 degrees C. (110 degrees F.); or,
    - ii) 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 percent alcohol) to one liter of water at 43 degrees C. (110 degrees F.); or,
    - iii) Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
  - e) Rinse components thoroughly in clean, warm (43 degrees C. [110 degrees F.] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis.
- 2) In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
  - a) Components should be hand-dried with a clean lint-free cloth or air-dried.
  - b) Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.
  - c) Test the respirator to ensure that all components work properly.

## APPENDIX B

## OSHA RESPIRATOR MEDICAL EVALUATION QUESTIONNAIRE

To Comply with §1910.134 – OSHA Respirator Medical Evaluation Questionnaire (Mandatory)

**Note:** Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

### Dear University of Portland Employees:

Please answer this questionnaire during normal working hours or at a time and place that is convenient to you. To maintain your confidentiality, no one at University of Portland will look at or review your answers; your completed questionnaire will be sent directly to the health care professional who will review it.

### Part A. Section 1

(Mandatory for **ALL EMPLOYEES** to be fitted for respiratory use) The following information must be provided by every employee who has been selected to use any type of respirator either on a mandatory or voluntary basis (please print).

1. Today's date: \_\_\_\_\_
2. Your name: \_\_\_\_\_
3. Your age (to nearest year): \_\_\_\_\_ Sex (circle one): Male / Female
4. Your height: ft. in. \_\_\_\_\_ Your weight: lbs. \_\_\_\_\_
5. Your job title: \_\_\_\_\_
6. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the area code): \_\_\_\_\_ - - \_\_\_\_\_
7. The best time to phone you at this number: \_\_\_\_\_
8. Have you been informed how to contact the health care professional who will review this questionnaire (circle one): Yes / No
9. Check the type of respirator you will use (you can check more than one category):
  - a. \_\_\_ N, R, or P disposable respirator (filter-mask, non-cartridge type only).
  - b. \_\_\_ Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).
10. Have you worn a respirator before (circle one): Yes / No
13. If "yes," what type(s): \_\_\_\_\_



**Part A. Section 2**

(Questions 1 through 9 are mandatory for **ALL EMPLOYEES** selected to use any type of respirator, either on a mandatory or voluntary basis.)

Please circle "yes" or "no".

1. Do you currently smoke tobacco, or have you smoked tobacco in the last month: Yes / No
2. Have you ever had any of the following conditions?
  - a. Seizures (fits): Yes / No
  - b. Diabetes (sugar disease): Yes / No
  - c. Allergic reactions that interfere with your breathing: Yes / No
  - d. Claustrophobia (fear of closed-in places): Yes / No
  - e. Trouble smelling odors: Yes / No
3. Have you ever had any of the following pulmonary or lung problems?
  - a. Asbestosis: Yes / No
  - c. Asthma: Yes / No
  - d. Chronic bronchitis: Yes / No
  - e. Emphysema: Yes / No
  - f. Pneumonia: Yes / No
  - g. Tuberculosis: Yes / No
  - h. Silicosis: Yes / No
  - i. Pneumothorax (collapsed lung): Yes / No
  - j. Lung cancer: Yes / No
  - k. Broken ribs: Yes / No
  - l. Any chest injuries or surgeries: Yes / No
  - m. Any other lung problem that you've been told about: Yes / No
4. Do you currently have any of the following symptoms of pulmonary or lung illness?
  - a. Shortness of breath: Yes / No
  - b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: Yes / No
  - c. Shortness of breath when walking with other people at an ordinary pace on level ground: Yes / No
  - d. Have to stop for breath when walking at your own pace on level ground: Yes / No
  - e. Shortness of breath when washing or dressing yourself: Yes / No
  - f. Shortness of breath that interferes with your job: Yes / No
  - g. Coughing that produces phlegm (thick sputum): Yes / No
  - h. Coughing that wakes you early in the morning: Yes / No
  - i. Coughing that occurs mostly when you are lying down: Yes / No
  - j. Coughing up blood in the last month: Yes / No
  - k. Wheezing: Yes / No
  - l. Wheezing that interferes with your job: Yes / No
  - m. Chest pain when you breathe deeply: Yes / No
  - n. Any other symptoms that you think may be related to lung problems: Yes / No

5. Have you ever had any of the following cardiovascular or heart problems?
  - a. Heart attack: Yes / No
  - b. Stroke: Yes / No
  - c. Angina: Yes / No
  - d. Heart failure: Yes / No
  - e. Swelling in your legs or feet (not caused by walking): Yes / No
  - f. Heart arrhythmia (heart beating irregularly): Yes / No
  - g. High blood pressure: Yes / No
  - h. Any other heart problem that you've been told about: Yes / No
6. Have you ever had any of the following cardiovascular or heart symptoms?
  - a. Frequent pain or tightness in your chest: Yes / No
  - b. Pain or tightness in your chest during physical activity: Yes / No
  - c. Pain or tightness in your chest that interferes with your job: Yes / No
  - d. In the past 2 years, have you noticed your heart skipping or missing a beat: Yes / No
  - e. Heartburn or indigestion that is not related to eating: Yes / No
  - f. Any other symptoms that you think may be related to heart or circulation problems: Yes / No
7. Do you currently take medication for any of the following problems?
  - a. Breathing or lung problems: Yes / No
  - b. Heart trouble: Yes / No
  - c. Blood pressure: Yes / No
  - d. Seizures (fits): Yes / No
8. If you've used a respirator, have you ever had any of the following problems? (If you've never used a respirator, check the following space and go to question 9 :)
  - a. Eye irritation: Yes / No
  - b. Skin allergies or rashes: Yes / No
  - c. Anxiety: Yes / No
  - d. General weakness or fatigue: Yes / No
  - e. Any other problem that interferes with your use of a respirator: Yes / No
9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes / No

**Questions 10 to 15** below must be answered by every employee who has been selected to use either a full-facepiece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is *voluntary*.

10. Have you ever lost vision in either eye (temporarily or permanently): Yes / No
11. Do you currently have any of the following vision problems?
  - a. Wear contact lenses: Yes / No
  - b. Wear glasses: Yes / No
  - c. Color blind: Yes / No
  - d. Any other eye or vision problem: Yes / No
12. Have you ever had an injury to your ears, including a broken ear drum: Yes / No



13. Do you currently have any of the following hearing problems?
- a. Difficulty hearing: Yes / No
  - b. Wear a hearing aid: Yes / No
  - c. Any other hearing or ear problem: Yes / No
14. Have you ever had a back injury: Yes / No
15. Do you currently have any of the following musculoskeletal problems?
- a. Weakness in any of your arms, hands, legs, or feet: Yes / No
  - b. Back pain: Yes / No
  - c. Difficulty fully moving your arms and legs: Yes / No
  - d. Pain or stiffness when you lean forward or backward at the waist: Yes / No
  - e. Difficulty fully moving your head up or down: Yes / No
  - f. Difficulty fully moving your head side to side: Yes / No
  - g. Difficulty bending at your knees: Yes / No
  - h. Difficulty squatting to the ground: Yes / No
  - i. Climbing a flight of stairs or a ladder carrying more than 25 pounds: Yes / No
  - j. Any other muscle or skeletal problem that interferes with using a respirator: Yes / No



## APPENDIX C

## QUALITATIVE AND QUANTITATIVE RESPIRATOR FIT TESTING

PART I: GENERAL RESPIRATOR FIT-TESTING PROCEDURES

To Comply with §1910.134 – Fit Testing Procedures (Mandatory)

➔ The requirements in this section apply to both OSHA-accepted fit test methods: QLFT (qualitative fit) and QNFT (quantitative fit).

OSHA-Accepted Fit Test Protocols**A. Fit Testing Procedures – General Requirements (MANDATORY)**

The employer shall conduct fit testing using the following procedures.

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. This instruction may not constitute the subject's formal training on respirator use, because it is only a review.
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 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. 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 is 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, using the negative pressure seal check described below or those recommended by the respirator manufacturer which provides equivalent protection to the procedures below. Before conducting the negative check, the subject shall be told to sit 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 must be selected and retested if the test subject fails the user seal check tests.
  - a) Negative pressure check: Close off the inlets of the cartridge with the palm of the hand or other item or remove the cartridges and cover the holes.
  - b) Inhale gently so that a vacuum occurs within the facepiece. Hold the breath for 5 to 10 seconds. If the vacuum remains, the respirator fits properly.
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 while performing her or his duties.
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. 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.
13. The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use which could interfere with respirator fit.
14. Test Exercises.
  - (a) Employers must perform the following test exercises for all fit testing methods prescribed in this appendix.
  - (b) For the qualitative fit testing methods, employers must ensure that employees perform the test exercises in the appropriate test environment in the following manner:
    - Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.
    - Deep breathing. In a normal 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. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).
    - 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.
    - Grimace. The test subject shall grimace by smiling or frowning.
    - Bending over. The test subject shall bend at the waist as if he/she were to touch his/her toes.
    - Normal breathing. Same as above.
  - (c) Each test exercise shall be performed for 1-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.

(d) The fit test must be administered using an OSHA-accepted protocol.

Qualitative Fit-Testing Protocols: Irritant smoke

Quantitative Fit-Testing Protocols: These are not used at University of Portland.

**Qualitative Respirator Fit: a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.**

**Qualitative Fit Testing – Document of Record**

<b>Employee Name</b>	<b>Date</b>
----------------------	-------------

- User seal check**
- Sensitivity Test Using:**           3M FT-31 (Bitter/Amer)
  - Place test hood
  - Determine sensitivity: Number of squeezes \_\_\_\_\_
- Fit Test Using:**                   3M FT-31 (Bitter/Amer)
  - Place test hood
  - Inject aerosol

<input type="checkbox"/> <b>Normal Breathing</b>	<input type="checkbox"/> <b>Talking</b>
<input type="checkbox"/> <b>Deep Breathing</b>	<input type="checkbox"/> <b>Bending</b>
<input type="checkbox"/> <b>Turning head side to side</b>	<input type="checkbox"/> <b>Normal Breathing</b>
<input type="checkbox"/> <b>Nodding head up and down</b>	

<b>Trainer Name (please print)</b>
<b>Signature</b>
<b>Date</b>

*Copies kept in employee file*

**PART II: DETAILED QUALITATIVE RESPIRATOR FIT-TESTING PROCEDURES USING IRRITANT SMOKE METHOD****1. General**

- (a) 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.
- (b) 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.

**2. Irritant Smoke (Stannic Chloride) Protocol**

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.

**(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 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.

**(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 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 facepiece 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, 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, 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 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.

**Quantitative Respirator Fit is using controlled negative pressure and appropriate instrumentation to measure the volumetric leak rate of a facepiece to quantify the respirator fit. University of Portland does not use this method for fit testing purposes.**

**PART III: ASSIGNED RESPIRATORY DEVICE PROTECTION FACTORS**

Type of Respirator Device	Assigned Protection Factor <sup>a</sup>
<b>Air-Purifying Respirators (APRs)</b> Fitted respirator devices with <ul style="list-style-type: none"> <li>▪ Particulate-filter</li> <li>▪ Vapor- or gas-removing</li> <li>▪ Combination particulate-filter and vapor- or gas-removing</li> </ul> Fitted, half- or full-facepiece for: <ul style="list-style-type: none"> <li>▪ Particulate-filter;</li> <li>▪ Vapor- or gas-removing;</li> <li>▪ Combination particulate-filter and vapor- or gas-removing</li> </ul>	10           95 100
<b>Powered Air-Purifying Respirators (PAPRs)</b> Powered air-purifying, loose fitting facepiece Powered air-purifying, half facepiece Powered air-purifying, full facepiece, equipped with HEPA filters or sorbent cartridges or canisters Powered air-purifying, hood or helmet equipped with HEPA filters or sorbent cartridges or canisters	100 25 50 1000 1000
<b>Supplied-Air (Airline) Respirators and Self-Contained Breathing Apparatus (SCBAs)</b> These devices are not used at University of Portland	

Combination respirators. For combination respirators (such as, airline respirators with an air-purifying filter), the type and mode of operation having the lowest respirator protection factor must be applied to the combination respirator not listed.

- An assigned protection factor (APF) is a numeric rating given to respirators, which tells how much protection the respirator can provide. Multiplying the permissible exposure limit (PEL) for a contaminant by the respirator APF gives the maximum concentration of the contaminant for which the respirator can be used.
- If the air contaminant causes eye irritation, the wearer of a respirator equipped with a quarter-mask or half-mask facepiece or mouthpiece and nose clamp must be permitted to use a protective goggle or to use a respirator equipped with a full facepiece. Mouthpiece and nose clamp respirators are approved by NIOSH only for escape from IDLH atmospheres.



**APPENDIX D**

**INFORMATION FOR EMPLOYEES USING RESPIRATORS  
WHEN NOT REQUIRED UNDER THE STANDARD (MANDATORY)**

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers.

However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

Employees voluntarily using respirators should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

\*\* Employees that voluntarily use a respirator must sign a fillable Appendix D and submit this form to EHS.

**APPENDIX E**

**LOG FORMS**

**Hazard Assessment Log**

Date:				
Department	Contaminants	Exposure Level (8 hr. TWA*)	PEL**	Controls

**Record of Respirator Use**

Required and Voluntary Respirator Use		Date:
Type of Respirator	Departments/Processes	
Filtering face piece (dust mask)		
Fitted face piece (P95+ filter)		
Half-face piece APR or PAPR with P100 filter		
<i>Respiratory Program Coordinator</i>		<i>Date</i>

**Process Hazard Evaluation**

Department:		Date:
Process Description	Hazards	
<i>Respiratory Program Coordinator</i>		<i>Date</i>



**Record of Respirator Equipment Issued to Employees**

Respiratory protection equipment is required for and has been issued to the following personnel:				
Employee	Department	Job Task	Respirator Type	Date Issued
Respiratory Program Coordinator			Date	

**Emergency Potential Log**

The following work areas at have been identified as having foreseeable emergencies:

Area	Type of Emergency	Location of Emergency Respirator(s)
Respiratory Program Coordinator		Date

*Continues...*

**Respirator Inspection Checklist**

<b>Type of Respirator:</b>	<b>Location:</b>
<b>Respirator Issued to:</b>	<b>Type of Hazard:</b>
Face piece	<input type="checkbox"/> Cracks, tears, or holes <input type="checkbox"/> Face mask distortion <input type="checkbox"/> Cracked or loose lenses/face shield
Head straps	<input type="checkbox"/> Breaks or tears <input type="checkbox"/> Broken buckles
Valves:	<input type="checkbox"/> Residue or dirt <input type="checkbox"/> Cracks or tears in valve material
Filters/Cartridges:	<input type="checkbox"/> Approval designation <input type="checkbox"/> Gaskets <input type="checkbox"/> Cracks or dents in housing <input type="checkbox"/> Proper cartridge for hazard
Rubber/Elastomer Parts	<input type="checkbox"/> Pliability <input type="checkbox"/> Deterioration
<i>Inspected by:</i> _____ <i>Date:</i> _____	

## APPENDIX F

**PARTICULATE RESPIRATORY PROTECTION – FILTER TYPES****Respirator Recommendations****NIOSH****Up to 0.5 mg/m<sup>3</sup>: (*Use these filters for protection from hazardous airborne silica dust particles*)**

- (APF = 10) Any particulate respirator equipped with an N95, R95, or P95 filter (including N95, R95, and P95 filtering facepieces) except quarter-mask respirators.
- The following filters may also be used: N99, R99, P99, N100, R100, P100.

**Up to 1.25 mg/m<sup>3</sup>:**

- (APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter.
- (APF = 25) Any supplied-air respirator operated in a continuous-flow mode

**Up to 2.5 mg/m<sup>3</sup>:**

- (APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.
- (APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter

**Up to 25 mg/m<sup>3</sup>:**

- (APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

**Emergency or planned entry into unknown concentrations or IDLH conditions:**

- (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
- (APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

**Escape:**

- (APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.
- Any appropriate escape-type, self-contained breathing apparatus

## APPENDIX G

## DEFINITIONS

**Air-purifying respirator** means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

**Assigned protection factor (APF)** means the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when the employer implements a continuing, effective respiratory protection program as specified by this section.

**Atmosphere-supplying respirator** means a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.

**Canister or cartridge** means a container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.

**Demand respirator** means an atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.

**Emergency situation** means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.

**Employee exposure** means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.

**End-of-service-life indicator (ESLI)** means a system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that sorbent is approaching saturation or is no longer effective.

**Escape-only respirator** means a respirator intended to be used only for emergency exit.

**Filter or air purifying element** means a component used in respirators to remove solid or liquid aerosols from the inspired air.

**Filtering facepiece (dust mask)** means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.

**Fit factor** means a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.

**Fit test** means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. (See also Qualitative fit test QLFT and Quantitative fit test QNFT.)

**Helmet** means a rigid respiratory inlet covering that also provides head protection against impact and penetration.

**High efficiency particulate air (HEPA) filter** means a filter that is at least 99.97% efficient in removing

monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.

**Hood** means a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.

**Immediately dangerous to life or health (IDLH)** means an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

**Loose-fitting facepiece** means a respiratory inlet covering that is designed to form a partial seal with the face.

**Maximum use concentration (MUC)** means the maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the required OSHA permissible exposure limit, short-term exposure limit, or ceiling limit. When no OSHA exposure limit is available for a hazardous substance, an employer must determine an MUC on the basis of relevant available information and informed professional judgment.

**Negative pressure respirator (tight fitting)** means a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to ambient air pressure outside the respirator.

**Oxygen deficient atmosphere** means an atmosphere with O<sub>2</sub> content below 19.5% by volume.

**Physician or other licensed health care professional (PLHCP)** means an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required by paragraph (e) of this section.

**Positive pressure respirator** means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

**Powered air-purifying respirator (PAPR)** means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

**Pressure demand respirator** means a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.

**Qualitative fit test (QLFT)** means a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.

**Quantitative fit test (QNFT)** means an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

**Respiratory inlet covering** means that portion of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a facepiece, helmet, hood, suit, or a mouthpiece respirator with nose clamp.

**Self-contained breathing apparatus (SCBA)** means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

**Service life** means the period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer.

**Supplied-air respirator (SAR) or airline respirator** means an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

**Tight-fitting facepiece** means a respiratory inlet covering that forms a complete seal with the face.

**User seal check** means an action conducted by the respirator user to determine if the respirator is properly seated to the face.

