

RESPIRATORY PROTECTION PROGRAM



**THE UNIVERSITY OF TEXAS
HEALTH SCIENCE CENTER
AT SAN ANTONIO**

**Provided by:
Environmental Health and Safety Department
Revised: November 2013**

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CERTIFICATION

I hereby certify that I have examined the facility and risk assessment and that this Respiratory Protection Program has been prepared in accordance with 29 CFR 1910.134.

This program establishes a respiratory protection plan to ensure the protection of all UTHSCSA faculty, staff, students and visitors from respiratory hazards through the proper use of approved respirators. This document outlines the institutional policies necessary to meet the regulatory intent for the proper use of approved respirators where engineering controls of respiratory hazards are not feasible or effective, while engineering controls are being installed or for emergency or other temporary situations.

Original Signed 12-12-13

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OBJECTIVE

To ensure the protection of all UTHSCSA faculty, staff, students and visitors from respiratory hazards through the proper use of approved respirators.

**RESPIRATORY PROTECTION PROGRAM
COMPLIANCE REVIEW**

A Respiratory Protection Program as outlined in 29 CFR 1910.134 is required to be maintained as long as The University of Texas Health Science Center at San Antonio has the potential for faculty, staff, students or visitors to be exposed to respiratory hazards. Superseded copies of this program will be retained for 5 years as required by UTHSCSA Records Retention Schedule.

Copies of this program will be maintained at the following offices:

1. Assistant VP for Risk Management & Safety (original)
2. Assistant VP for Facilities Management (1st copy)
3. Executive Vice President for Facilities Planning and Operations (2nd copy)

In accordance with 29 CFR § 1910.134 (c) (1) a review and evaluation of this program is conducted at least once each year. The program shall be updated as necessary to reflect those changes in workplace conditions that affect respirator use. As a result of this review and evaluation, the University of Texas Health Science Center at San Antonio will amend this program within six months of the review- if the review indicates changes should be made in the program.

| Review Date | Signature | Date |
|------------------|-----------|-------|
| 1. November 2014 | _____ | _____ |
| 2. November 2015 | _____ | _____ |
| 3. November 2016 | _____ | _____ |
| 4. November 2017 | _____ | _____ |

Review Comments



I . Foreword

The University of Texas Health Science Center, San Antonio (UTHSCSA) has a fundamental commitment and responsibility to protect the health and safety of its staff, faculty, students, and the visiting public when participating in official activities. Many occupational diseases can be effectively prevented by minimizing or eliminating the potential of breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors. This is effectively accomplished through installation of certified engineering control systems that enclose or confine unhealthy operations, remove contaminated air by means of general and local ventilation, or substituting toxic materials with less harmful or non-injurious compounds. When effective engineering controls are not feasible, or while they are being instituted, it is the aim of this Program to ensure that appropriate respiratory protection is provided, utilized, and maintained in an appropriate and safe manner.

II . Purpose

The purpose of this program is to ensure the protection of all UTHSCSA faculty, staff, students and visitors from respiratory hazards through the proper use of approved respirators. Job-specific respirators shall be provided by UTHSCSA and are to be used where engineering control of respiratory hazards to levels below established Occupational Exposure Levels (OEL):

- A. Is not feasible or effective.
- B. While engineering controls are being installed or repaired.
- C. For emergency or other temporary situations.

Voluntary respirator use (when exposure to airborne contaminants is below the OEL) is permitted upon individual request and Environmental Health and Safety (EH&S) review (See Appendix D). The procedures set forth in this program are in full compliance with Occupational Safety and Health Administration's (OSHA) 29 CFR 1910.134 (Respiratory Protection Standard, revised June 8, 2011). Procedures apply to all UTHSCSA students and employees. Non-UTHSCSA personnel working at the University of Texas Health Science Center at San Antonio must observe procedures that are equivalent to or exceed the requirements of this UTHSCSA Respiratory Protection Program.

III . Responsibilities

A. Environmental Health and Safety will:

- Manage the UTHSCSA Respiratory Protection Program. The Director of Environmental Health and Safety (EH&S) will serve as the Respiratory Protection Program Administrator.
- Provide training in accordance with Chapter VIII.
- Conduct fit-testing.
- Maintain documentation of training and fit testing.
- Recommend appropriate respirators, cartridges and replacement parts.
- Conduct periodic monitoring to assess concentrations of airborne contaminants.
- Conduct periodic inspections of respirator use and storage, and ensure these inspections are properly documented.

B. UT Medicine or Medical Service Provider:

- Perform and document initial and subsequent medical surveillance of all UTHSCSA respirator wearers at UTHSCSA expense.

C. Employee Supervisors will:

- Identify employees who are routinely exposed to airborne contaminants at or above the OEL in performance of duties for which they were hired. When there is uncertainty about the measurement of these levels, EH&S or outside consultation may be needed.
- With EH&S guidance and approval, purchase, at UTHSCSA expense, appropriate respirators, cartridges, and approved replacement parts for student/employee identified in paragraph above.
- Ensure employees receive Physician's clearance (by physical examination and questionnaire) to use a respirator.
- Ensure employees are properly trained before utilizing respiratory protection, and that employees receive any required refresher training.
- Contact EH&S to perform any initial or follow-up monitoring.
- Report any problems with respiratory protection to EH&S
- Ensure that employees are up-to-date for fit testing.
- Ensure that employees who are required to wear a respirator because of potential exposure, do so, as a condition of employment.
- Ensure that any Self Contained Breathing Apparatus (SCBA) tanks have had hydrostatic testing as per manufacturer's recommendations, and that this has been properly documented.

D. Respirator Wearer will:

- Clean and inspect respirator before and after each use.
- Store respirator in a re-sealable plastic bag in a clean area away from possible contaminants.
- Use respirator in accordance with manufacturer's recommendations.
- Properly wear respirator and all related equipment as trained.
- Report any problems with respiratory protection to the department supervisor.

IV . Determination of Need for Respiratory Protection

It is each supervisor's responsibility to ensure that EH&S is notified of all practices which may present the need for students or employees to wear respiratory protection. If engineering controls for achieving respiratory protection are neither technologically nor economically feasible, then the use of respiratory protection is required for tasks such as, but not limited to:

- Those that liberate harmful dusts, mists, fumes, vapors, or gasses
- Those that occur in areas in which unacceptable levels of exposure could result from the processing, handling, storing, or disposing of hazardous substances
- Those that require entry into oxygen-deficient or potentially oxygen-deficient environments.

Exposure determinations will be conducted by EH&S to confirm or justify the need for, or continued use of, respiratory protection. EH&S must also be notified when engineering or procedural changes occur which could affect employee or student exposures, or when new hazards are introduced into the workplace, to allow for subsequent exposure determinations to be initiated.

V. Medical Surveillance

Employees and/or students will not be assigned to tasks requiring use of respirators unless it has been determined that their health and physical condition will enable them to do so safely. This will be determined by UT Medicine or a Licensed Health Care Provider contracted by UTHSCSA at no cost to the employee/student before fit testing or use of a respirator. It is possible, if requested, that an employee or student may use his or her personal health care practitioner to provide a medical evaluation. In this case, however, the employer is required to contact the physician or other licensed health care professional (PLHCP) and provide him/her with a copy of the respiratory protection standard and other required supplemental information, such as any workplace variables that may increase pulmonary and cardiovascular stress during respirator use. The employer shall bear the costs of the evaluation, and periodic updates may also be required. The physician or PLHCP will conduct a medical evaluation including a spirometer test, and administer an OSHA-approved medical questionnaire (Appendix C). The physician or PLHCP will be asked to sign a written recommendation regarding the employee's ability to use the respirator. The respirator user's medical status will be reviewed periodically as determined by the health care practitioner in his written medical opinion.

VI . Types of Respirators

There are two primary types of respiratory protective equipment one may utilize when appropriate engineering controls are not feasible. These types of respirators are referred to as air-purifying respirators and atmosphere supplying respirators. The following is a description of air purifying and atmosphere supplying respirators and their limitations for use:

A. Air Purifying Respirators:

Description:

Air-purifying respirators remove particulate, vapor, and gas contaminants from the air we breathe prior to inhalation. Some common examples of these contaminants include welding fumes, asbestos fibers, solvent vapors, and pesticide mists. Contaminants of this type are removed by a cartridge or canister, which is fixed to the respirator face piece. The cartridges and canisters remove contaminants by various filtering and absorption mechanisms.

Air-purifying respirators may be powered or non-powered units. The use of a non-powered air-purifying respirator may result in additional physical stress due to an increased difficulty in breathing. A powered air-purifying respirator is equipped with a blower, which passes ambient air through the air-purification unit and then supplies the purified air to the respirator face piece.

Limitations:

Air-purifying respirators must not be used in oxygen-deficient atmospheres (<19.5%) or in atmospheres that are Immediately Dangerous to Life and Health (IDLH). Examples of work place situations that may be oxygen-deficient or IDLH include confined spaces and work areas that have high air-borne concentrations of toxic chemicals. Work environments such as this will require a higher level of protection (see Atmosphere-Supplying Respirators).

The Maximum Use Concentration (MUC) may be determined with a simple calculation if the concentration of the air-borne contaminant is known. The MUC is calculated by determining the OSHA Permissible Exposure Limit (PEL) for a specific hazard and multiplying it by the Assigned Protection Factor (APF) for the respirator. The assigned protection factor is the level of protection a respirator provides if worn properly. The greater the number, the greater is the protection. (See Tables 1 and 2). In order to ensure that the appropriate cartridge or canister is being used with your respirator, EH&S will recommend one specific to the particular hazards of your job.

B. Atmosphere-Supplying Respirators:

Description:

Atmosphere-Supplying respirators provide the user with breathable air independent of the ambient air. These types of respirators may be used to provide protection in oxygen-deficient atmospheres and in highly toxic atmospheres. There are several different types of atmosphere-supplying respirators that offer a superior degree of protection against atmospheric contaminants and require specialized training for use:

Self-Contained Breathing Apparatus (SCBA):

The self-contained breathing apparatus (SCBA) is a unit that allows the user to carry their breathing atmosphere with them. SCBA's are normally used when there is a short-term need to enter and escape from atmospheres that are or may be immediately dangerous to life and health (IDLH). Normally, employees of UTHSCSA would not use SCBA and any work requiring such atmosphere-supplying respirators would be contracted to properly trained and equipped personnel. The most important limitation associated with using the SCBA is the oxygen capacity of the device. Most SCBA's only have a 15-30 minute oxygen supply, which may be rapidly depleted if the work rate increases or if the atmospheric pressure changes.

Supplied Air Respirator (SAR) :

The supplied air respirator (SAR) is a unit whose use is not limited to the amount of oxygen one can carry with them into a hazardous atmosphere. SAR's are typically in line with a high-volume/high pressure breathing air cylinder cascade. Alternatively, these respirators may be in line with an air blower, which blows uncontaminated ambient air into the facepiece. These types of respirators, regardless of mode of operation, allow the user to remain in the contaminated atmosphere much longer than would be possible with a SCBA. These units are lightweight but limit the range of user mobility. They are normally used when there are extended work periods required in atmospheres that are not IDLH.

Combination Respirators:

A combination air-line respirator with auxiliary SCBA is available which provides users with the highest degree of protection possible. These units allow the wearer to escape dangerous atmospheres if the SAR fails during use. These respirators are used when there are extended work periods required in atmospheres that are or may be IDLH.

Table 1: NIOSH Assigned Protection Factors (APF)

| <u>Type of Respirator</u> | <u>APF</u> |
|------------------------------------|-------------------|
| Air-Purifying: | |
| Filtering Facepiece | 10 |
| Half-Mask | 10 |
| Full-Facepiece | 50 |
| Powered Air-Purifying: | |
| Half-Mask | 50 |
| Full-Facepiece | 1,000 |
| Loose-Fitting Facepiece | 25 |
| Hood or Helmet | 25/1,000* |
| Air-Line: (Half-mask) | |
| Demand | 10 |
| Continuous Flow | 50 |
| Pressure Demand | 50 |
| Air-Line: (Full-Face piece) | |
| Demand | 50 |
| Continuous Flow | 1,000 |
| Pressure Demand | 1,000 |
| Loose-Fitting Facepiece | 25 |
| Hood or Helmet | 25/1,000* |
| SCBA: | |
| Demand | 50 |
| Pressure Demand | 10,000 |

* The employer must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.

Table 2: Maximum Use Concentration (MUC) Calculations:

| Assigned Protection Factor (APF) | Permissible Exposure Limit (PEL) | Maximum Use Concentration (MUC) |
|---|---|--|
| 1.) 10 | 10 mg/m ³ (8 hr. TWA) | 100 mg/m ³ |
| 2.) 50 | 0.75 ppm (8 hr. TWA) | 37.5 ppm |
| 3.) 2,000 | 1.0 ppm (8 hr. TWA) | 2,000 ppm |

- 1.) APF for Half Mask Non-Powered Air Purifying respirator & PEL for Grain Dust from OSHA 1910.1000
- 2.) APF for Full Face Air-Purifying respirator and PEL for Formaldehyde from OSHA 1910.1048
- 3.) APF for Air-Line respirator with a full face piece in pressure demand mode and PEL for Benzene from OSHA 1910.1028



VII . Selection of Respirators

Only respirators that have been certified by the National Institute for Occupational Safety and Health (NIOSH) will be used in the UTHSCSA Respiratory Protection Program. Respirators are certified as an assembly, and substitution of parts from other manufacturers or models is strictly prohibited. The respirator shall be used in compliance with the conditions of its certification, and the NIOSH label on the cartridge or filter must not be obscured, removed, or defaced while it is in service. A respirator will be issued to an individual for his or her exclusive use and shall not be used by another employee or student.

Selection of appropriate respirators will be based on the specific respiratory hazard(s) to which the worker is exposed and workplace and user factors that affect respirator performance and reliability (29CFR 1910.134 (d)(1)(i)). In order to assist employees in determining exposure levels, EH&S will conduct area monitoring to determine workplace hazards such as oxygen deficiency and air contamination by particulates, vapors, or gases. Half-face and full-face air-purifying respirators equipped with the appropriate respirator filters/cartridges will be used to provide protection against specific hazards in atmospheres that are NOT:

- Oxygen deficient
- Immediately dangerous to life and health (IDLH)
- Exceeding the limitations of the selected respirator filters or cartridges

When exposure cannot be identified or reasonably estimated, the atmosphere shall be considered IDLH. In atmospheres where any of the aforementioned hazards exist, employees shall use either a self-contained breathing apparatus (SCBA) or a positive pressure supplied air respirator equipped with an emergency escape pack.

VIII . Training

To ensure the proper and safe use of a respirator, each user will be thoroughly trained at the time of initial fit testing and annually thereafter. The training will be conducted by a staff member of EH&S, a contracted instructor or via a UTHSCSA-approved computer-based training course. This training will be documented and information retained by EH&S. The training will include, but not necessarily be limited to:

- Why a respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
- What the limitations and capabilities of the respirator are;
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions;
- How to inspect, put on and remove, use, and check the seals of the respirator;
- What the procedures are for maintenance and storage of the respirator;
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators;
- The nature, extent, and effects of respiratory hazards in the workplace;
- The need to inform their supervisors of any problems experienced by them or their coworkers;
- An explanation of why a particular type of respirator has been selected for a specific respiratory hazard;
- Successful completion of a fit test;
- An opportunity to handle a respirator;
- Demonstrate knowledge of the above training elements;
- Employees who voluntarily use respirators will be given the advisory information from Appendix E.
- An opportunity to ask questions.

IX . Respirator Fit Testing

All UTHSCSA employees or students required to wear a respirator that has a tight-fitting face piece must be properly fit tested according to OSHA approved procedures. These fit testing procedures shall be performed before the first use of the respirator using the same make, model, style, and size respirator that will be used on the job. Additional fit testing will be performed if a different face piece is to be used or if a supervisor notices a change in the user's physical condition that may compromise the fit of the respirator face piece. Although quantitative fit testing is the preferred and more complete method of verifying the adequacy of the seal, situations may arise where it is not feasible to perform a quantitative fit test (i.e. emergencies, test equipment malfunctions). In the latter situations, qualitative fit testing is an acceptable alternative.

UTHSCSA prohibits the use of respirators with tight-fitting face pieces to be worn by students or employees who have facial hair that comes between the sealing surface of the face piece and the face or that which interferes with valve function (i.e. beards, "handlebar" mustaches, sideburns). Other conditions that may prohibit tight-fitting

respirator use include, but are not limited to; missing dentures, facial scars, severe acne, or the use of headgear or eyewear that projects under the face piece seal. Respirator use is permitted as long as a condition does not prevent an adequate seal.

Fit testing is performed before initial use of the respirator and at least annually thereafter, and will be conducted by a trained member of Environmental Health and Safety or as stipulated above. Complete fit-testing procedures are given in Appendix A.

X . Use and Maintenance of Respirators

A. Visual Inspection:

Without regular respirator inspection, users can not be sure that they are receiving adequate protection from airborne hazards. In fact, wearing poorly maintained or malfunctioning respirators may be more dangerous than not wearing a respirator at all. UTHSCSA must replace, repair, or discard a respirator that is not functioning properly, and a defective respirator must, with no exceptions, be replaced or repaired before the user enters or returns to any possibly contaminated area. Respirator users receive a review of proper inspection and maintenance steps as part of annual fit-testing. All respirator users should closely inspect and document (Appendix G) the following parts of the respirator before and after each use and during cleaning:

Rubber face-piece:

- Cracked or broken air-purifying element holder(s)
- Excessive dirt
- Cracks, tears, or holes
- Distortion
- Cracked, scratched, or loose-fitting lens (full face)
- Incorrectly mounted full face-piece lens or broken/missing mounting clips

Head Strap:

- Breaks or tears
- Loss of elasticity
- Broken or malfunctioning buckles/attachments
- Excessively worn serrations on head piece
- Harness which might allow the face-piece to slip

Inhalation/Exhalation Valves:

- Detergent residue, dust particles, dirt, or hair on valve or valve seat
- Cracks, tears, distortion in valve material or valve seat
- Improper insertion of the valve body in the face-piece

- Cracks, breaks, or chips in the valve body, particularly in the sealing surface
- Improper installation of the valve in the valve body

Filter elements:

- Incorrect cartridge, canister, or filter for the hazard
- Missing or worn gaskets
- Worn threads
- Cracks or dents in filter housing
- Incorrect installation, loose connections, or cross-threading in holder
- Outdated use of cartridge or canister (see Section XI: Change-out Schedule)

SCBA's:

- Require an inspection of the air and oxygen cylinders to assure that the cylinder pressure is maintained at or above 90% of the manufacturer's recommended pressure level and that the regulator and low pressure warning devices function properly. The warning device must be activated and heard by the person performing the inspection.

B. Seal Checks:

The wearer of a respirator equipped with a tight fitting face piece must check the seal of the face piece routinely prior to each entry into a potentially contaminated area. The seal may also be checked during use if the user questions the fit. Either the positive and negative pressure checks listed below or the respirator manufacturer's recommended user seal check method shall be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

1. Positive pressure check:

Close off the exhalation valve with the palm of the hand and exhale gently into the face piece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the face piece without any evidence of air at the seal.

2. Negative pressure check:

Close off the inlet opening of the canister(s) or cartridge(s) by covering with the palms of the hands and inhale gently so that the face piece collapses slightly. Hold the breath for ten seconds. The face piece should remain slightly collapsed with no inward leakage.

C. Cleaning and Disinfection:

Respirators should be cleaned by the individual user following each use. Procedures recommended by the respirator manufacturer or those set forth in the following description may be used: (29CFR 1910.134 App B-2)

1. Remove filters, cartridges, or canisters. Disassemble face pieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
2. Wash components in warm (43°C/110°F maximum) water with a mild detergent or a disinfectant cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.
3. Rinse components thoroughly in clean, warm (43°C/110°F maximum) water, preferably running water. Drain.
4. 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 (50ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43°C/110°F; or
 - b. Aqueous solution of iodine (50ppm 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 water at 43° C / 110° F; 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.
 - d. Rinse components thoroughly in clean, warm (43°C/110°F maximum) water, preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on face pieces 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 face piece, replacing filters, cartridges, and canisters where necessary.
 - g. Test the respirator to ensure that all components work properly.

D. Storage:

“All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed or stored to prevent deformation of the face piece and exhalation valve.” (29CFR 1910.134 (h)(2)(i)). Respirators should be stored in sealable plastic bags or in containers with tight fitting lids. Respirators should not be hung by their straps as this could cause distortion of the mask area and damage to the straps. Follow the manufacturer’s directions for specific storage requirements.



XI . Changeout Schedule

A change-out schedule is a document that is now required by OSHA as of October 1998. It explains how long a particular chemical cartridge or canister used with an air-purifying respirator may be used in a specific work environment. A schedule of this nature is based on objective data obtained through various research institutes, such as NIOSH, and from individual cartridge and canister manufacturers. The schedule may also take into consideration work rate, relative humidity, chemical concentration, and multiple chemical contaminants. To ensure that these cartridges are changed before they are no longer effective, a change-out schedule is necessary. The following are guidelines for estimating change-out for organic vapor cartridges:

- If the organic vapor’s boiling point is greater than 70⁰ C and its concentration less than 200 ppm, the organic vapor cartridge should last 8 hours at a normal work rate (assuming normal breathing rate).
 - Service life is inversely proportional to flow rate.
 - If the concentration is reduced by a factor of 10, the service life will only increase by 5.
 - Humidity greater than 85% generally reduces service life by 50%.
- (Source: Occupational Environment – Its Evaluation & Control, 1997)

A Risk Assessment of potential UTHSCSA staff that may be in the Respiratory Protection Program is depicted in Table 5.

Respirator users may no longer rely on warning properties as the sole basis for determining change schedules, however, respirator users should be trained to understand that abnormal odor or irritation is evidence that respirator cartridges need to be replaced. When there is a mix of contaminants, the service life will be based on the contaminant with the shortest breakthrough time. Many manufacturers are now installing End of Service Life Indicators (ESLI's) on respirator cartridges. An ESLI is a system that changes color, therefore alerting the user that the cartridge must be replaced. The respirator user must strictly follow the manufacturer's guidelines to prevent health risks. The following tables contain current examples:

Table 3: Chemical Cartridge and Canister Change-out Schedule

| Chemical | Recommended Change-out Schedule |
|---|---|
| Acrylonitrile 1910.1045 (h)(2)(ii) | End-of-service life or at the end of each work shift, whichever occurs first. |
| Benzene 1910.1028 (g)(2)(ii) | End-of-service life or at the beginning of each shift, whichever occurs first |
| Butadiene 1910.1051 (h)(2)(ii) | Every 1,2, or 4 hours dependent on concentration and at the beginning of each shift |
| Formaldehyde 1910.1048 (g)(3)(ii) | Cartridges – every 3 hours or end of shift, whichever is sooner Canisters – every 2 or 4 hours according to schedule in (g)(3)(iv) |
| Vinyl Chloride 1910.1017 (g)(3)(ii) | End-of-service life or end of shift in which they are first used, whichever comes first. |
| Methylene Chloride 1910.1052 (g)(2)(ii) | Canisters may only be used for emergency escape and must be replaced after use. |

Table 4: Particulate Filter Change-out Schedule



| | |
|--|---|
| <p>N-series: use for protection against solid and water based particles</p> <ul style="list-style-type: none"> - N95 - N99 - N100 | <p>All N series filters have no specific service time. They may be used multiple shifts and may continue until a breathing resistance is noted.</p> |
| <p>R-series: use for protection against any particles (including oil aerosols).</p> <ul style="list-style-type: none"> - R95 - R99 - R100 | <p>All R series filters have a useful service time of an 8-hour shift.</p> |
| <p>P-series: use for protection against any particles (including oil aerosols).</p> <ul style="list-style-type: none"> - P95 - P99 - P 100 | <p>All P series filters have varying service times. See manufacturer's time use limitations for more information.</p> |

Table 5 : Potential Support Departments and Employees in Respirator Protection Program

| DEPT | Division/ Group | Job Category/ Title | APF * | Resp. Med. Eval. | Respirator fit-Test | | | |
|---------------|-----------------------|------------------------------------|----------|------------------------|---------------------|---------------|---------------|-----------|
| | | | | | N-0 Particulate | Half- Face | Full- Face | |
| EHS | Chem/Bio | Manager & Safety Specialists | 10/50 | 5 | 5 | 0 | 5 | |
| EHS | Envir. Prot. | “ | 10/50 | 3 | 3 | 3 | 3 | |
| EHS | Physical Safety | “ | 50 | 2 | 0 | 0 | 2 | |
| EHS | Rad. Safety | “ | 50 | 4 | 0 | 0 | 4 | |
| FM | Electric Shop | Maintenance Worker | 50 | 4 | 0 | 0 | 4 | |
| FM | P.M. Shop | Maintenance Worker | NA | 0 | 0 | 0 | 0 | |
| FM | CEP | Utilities Operator | 10/50 | 15 | 15 | 15 | 15 | |
| FM | Utilities | Operator 1-2 | 50 | 14 | 0 | 0 | 14 | |
| FM | Elevator Shop | Maintenance Worker | NA | 3 | 0 | 0 | 0 | |
| FM | Auto Shop | Auto Mechanic | NA | 0 | 0 | 0 | 0 | |
| FM | Grounds | Groundskeeper | 10 | 2 | 0 | 2 | 0 | |
| FM | Custodial Services | Building attendant 1-4 | NA | 0 | 0 | 0 | 0 | |
| UTPD | Admin. | Peace/Police Officer | 10 | 2 | 2 | 0 | 0 | |
| UTPD | Admin. | Guard | 10 | 6 | 6 | 0 | 0 | |
| TOTALS | | | | | 60 | 31 | 20 | 47 |

* APF : Assigned Protection Factor

XII . Mycobacterium tuberculosis

Respiratory protection against *M. tuberculosis* will follow OSHA’s 29CFR 1910.134 as outlined in the UTHSCSA Biological Safety Handbook. The scope of the *M. tuberculosis* control plan is to achieve early detection, isolation, and treatment of persons with active tuberculosis (TB) and to minimize the risk of TB transmission through:

- The use of administrative measures to reduce the risk of exposure to persons with suspected or confirmed infectious TB

- The use of engineering controls to prevent the spread and reduce the concentration of infectious droplet nuclei
- The use of personal respiratory protective equipment

Health care workers should wear a NIOSH approved high efficiency particulate air (HEPA) respirator under the following circumstances:

- when entering rooms housing patients with suspected or confirmed infectious TB
- when performing high risk procedures on patients who have suspected or confirmed infectious TB. Examples of these include administration of aerosolized medications, bronchoscopy, sputum induction, endotracheal intubation and suctioning procedures, and autopsies.
- Emergency medical response personnel or others who must transport, in a closed vehicle, and individual with suspected or confirmed infectious TB.

Healthcare providers may fit test UTHSCSA employees and students at worksites off the UTHSCSA campus. Fit testing in compliance with procedures set forth in 29 CFR 1910.134 may be available at these alternate worksites. UTHSCSA laboratory employees working with TB should also wear an approved respirator.

XIII . Workers Exposed to Infectious Aerosols

The results of a study comparing the abilities of a surgical mask and a NIOSH-approved N95 respirator to protect workers against exposures to airborne latex allergenic particles provides evidence suggesting that the FDA tests might overestimate the filter efficiencies of surgical masks. (Mitakakis et al., 2002).

Outbreaks of new and emerging infectious diseases may present the most difficult challenges to the selection and use of respirators in healthcare and research settings where workers' risks of exposure to an infectious agent (e.g., the etiology of the problem, the source or mode of transmission) are uncertain (Goodman, Buehler, & Koplan, 1990; Reingold, 1998). Healthcare workers caring for patients in such settings may be at a risk of infection while the data of the outbreak investigation are being collected and analyzed. The importance of balancing the need for thorough assessment of causality with the potentially conflicting need to intervene quickly to protect the health of workers means, in practice, that implementing control measures will oftentimes be appropriate at any point in the outbreak investigation sequence. (Reingold, 1998). This public health approach is consistent with guidance concerning occupational health practice that states: "When doubt exists about the severity of an occupational hazard, prudent precautionary action must be considered immediately and taken as appropriate" (International Commission on Occupational Health, 2002). Workers potentially exposed to infectious aerosols are encouraged to read: (Lenhart, Seitz, Trout and Bollinger, 2004).

XIV . Recordkeeping

UTHSCSA will record and maintain appropriate documentation of this Respiratory Protection Program. The following is a list of those items that will be documented and who is responsible for each:

- 1. Medical Evaluation** – all documentation will be maintained by University Physicians Group (UPG). This documentation shall include the written recommendation regarding the employee’s ability to use the respirator from the PLHCP as outlined in 29 CFR 1910.134 (e)(6)(i).
- 2. Fit testing** – all fit testing documentation will be maintained by EH&S.
- 3. Training** – all initial and follow up training documentation will be maintained by EH&S.

XV . Program Surveillance

Periodic inspections and program evaluation will be conducted by EH&S to determine the continued effectiveness of the Respiratory Protection Plan.

XVI . Appendices

Appendix A – Fit Test Procedures

Employers shall conduct fit testing using the procedures as outlined in 29 CFR Section 1910-134, Appendix A. – Fit Testing Procedures (Mandatory). The requirements in this appendix apply to all OSHA-accepted fit test methods, both QLFT (qualitative) and QNFT (quantitative).

Appendix B – Respirator Cleaning Procedures

The procedures found in 29 CFR Section 1910.134, Appendix B are provided for employer use when cleaning respirators. The procedures are general in nature. The employer as an alternative may use cleaning recommendations provided by the respirator manufacturer.

Appendix C – Medical Evaluation Questionnaire

Employees and employers are encouraged to read 29 CFR Section 1910.134 Respiratory Protection, Appendix C: OSHA Respirator Medical Evaluation Questionnaire (Mandatory). This appendix provides the specific questions which an employer must allow employees to answer during normal working hours or at a time convenient to the employee. Supervisors and employers are not allowed to look at this questionnaire in order to maintain confidentiality. The employer must tell the employee how to deliver or send this questionnaire to the health care provider who will review it.

Appendix D – Information for Voluntary Respirator Use

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. 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. If you use a voluntary respirator you should read Appendix D to 29 CFR Section 1910-134. (Mandatory) Information for Employees Using Respirators When Not Required Under the Standard.

Appendix E – Respirator User’s Fit Test Report

A record of the fit test shall be kept on file, assuming the fit test was successful. The record must contain the test subject’s name; overall fit factor; make; model; style and size of the respirator used; and the date tested and due date. A hard copy of the Fit Test Report shall be maintained until the next fit test report is completed. The quantitative fit test machine with supporting computer system will maintain electronic copies of reports until cleared.

Appendix F – Definitions

The definitions pertinent to this respiratory protection program can be found in 29 CFR 1910.134 (b) *Definitions*.

Appendix G – Seal Check Procedures

Any individual who uses a tight fitting respirator is to perform a user seal check to ensure that an adequate seal is achieved each time the respirator is put on. Either positive or negative pressure checks or the manufacturer’s recommended used seal check method shall be used. User seal checks are not substitutes for quantitative or qualitative fit tests as outlined in Section X . B . of this document or as outlined in Appendix B-1 of 29 CFR 1910.134.

Appendix H – Supervisor/Employee Checklist for Respirator Use

| <u>Requirement</u> | <u>Citation</u> | <u>Status</u> | | |
|---|---------------------------|----------------------|-------------------|----------------|
| | | Complete | Incomplete | Pending |
| Selection of Employees | 1910.134 (c) | | | |
| Procedure for Selecting Appropriate Respirator | (d) | | | |
| Medical Evaluation | (e) | | | |
| Fit-Testing (Annual Requirement) | (f) | | | |
| Procedures for Proper Use of Respirators | (g) | | | |
| Procedures for cleaning, repairing, inspecting and storing | (h) | | | |
| Training of employees in respirator hazards to which potentially exposed | (i) | | | |
| Identification of filters, cartridges & canisters | (j) | | | |
| Training employee in proper use of respirator | (k) | | | |
| Evaluation of Program | | | | |

**Appendix I -
29 CFR 1910.134 - Respiratory Protection**

This appendix provides a copy of:

**MAJOR REQUIREMENTS OF OSHA'S
RESPIRATORY PROTECTION STANDARD
29 CFR 1910.134**

OSHA Office of Training and Education, December 2006

This document discusses the major requirements of OSHA's Respiratory Protection Standard, 29 CFR 1910.134.

No attempt has been made to discuss every detail of the standard. Readers are encouraged to consult OSHA's Respiratory Protection web page for the complete text.

MAJOR REQUIREMENTS OF 29 CFR 1910.134

Introduction

- This standard applies to General Industry (Part 1910), Shipyards (Part 1915), Marine Terminals (Part 1917), Longshoring (Part 1918), and Construction (Part 1926).

(a) Permissible Practice

- Paragraph (a)(1) establishes OSHA's **hierarchy of controls** by requiring the use of **feasible engineering controls** as the primary means to control air contaminants. Respirators are required when "effective engineering controls are not feasible, or while they are being instituted."
- Paragraph (a)(2) requires employers to provide employees with respirators that are "applicable and suitable" for the purpose intended "when such equipment is necessary to protect the health of the employee."

(b) Definitions

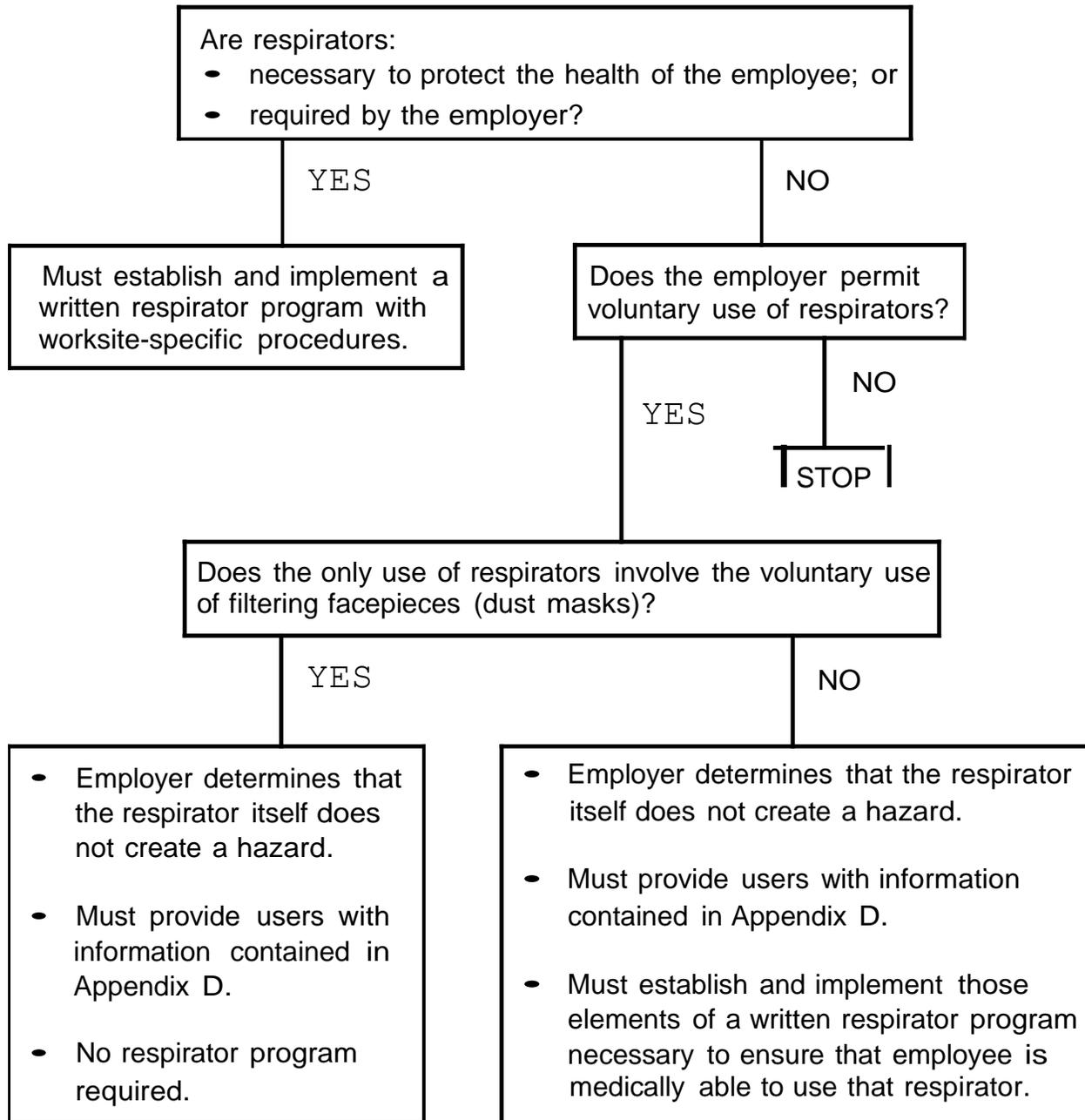
- This paragraph contains definitions of important terms used in the regulatory text.

(c) Respiratory Protection Program

- Must designate a **qualified program administrator** to oversee the program.
- Must provide respirators, training, and medical evaluations at **no cost to the employee**.
- OSHA has prepared a Small Entity Compliance Guide that contains criteria for selection of a program administrator and a sample program.

Respirator-Use Requirements Flow Chart

29 CFR 1910.134(c)



(d) Selection of Respirators

- Must select a respirator **certified by the National Institute for Occupational Safety and Health (NIOSH)** which must be used in compliance with the conditions of its certification.
- Must identify and evaluate the respiratory hazards in the workplace, including a reasonable estimate of employee exposures and identification of the contaminant's chemical state and physical form.
- Where exposure cannot be identified or reasonably estimated, the atmosphere shall be considered immediately dangerous to life or health (IDLH).
- Respirators for IDLH atmospheres:
 - Approved respirators:
 - full facepiece pressure demand self-contained breathing apparatus (SCBA) certified by NIOSH for a minimum service life of thirty minutes, or
 - combination full facepiece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.
 - **All oxygen-deficient atmospheres (less than 19.5% O₂ by volume) shall be considered IDLH.**

Exception: If the employer can demonstrate that, under all foreseeable conditions, oxygen levels in the work area can be maintained within the ranges specified in Table II (i.e., between 19.5% and a lower value that corresponds to an altitude-adjusted oxygen partial pressure equivalent to 16% oxygen at sea level), then any atmosphere-supplying respirator may be used.
- Respirators for non-IDLH atmospheres:
 - Employers must use the **assigned protection factors (APFs)** listed in Table 1 to select a respirator that meets or exceeds the required level of employee protection.
 - When using a combination respirator (e.g., airline respirators with an air-purifying filter), employers must ensure that the assigned protection factor is appropriate to the mode of operation in which the respirator is being used.
 - Must select a respirator for employee use that maintains the employee's exposure to the hazardous substance, when measured outside the respirator, at or below the **maximum use concentration (MUC)**.
 - Must not apply MUCs to conditions that are IDLH; instead must use respirators listed for IDLH conditions in paragraph (d)(2) of this standard.
 - When the calculated MUC exceeds the IDLH level or the performance limits of the cartridge or canister, then employers must set the maximum MUC at that lower limit.
 - The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.

- For protection against gases and vapors, the employer shall provide:
 - an atmosphere-supplying respirator, or
 - an air-purifying respirator, provided that:
 - the respirator is equipped with an **end-of-service-life indicator (ESLI)** certified by NIOSH for the contaminant; or
 - if there is no ESLI appropriate for conditions of the employer's workplace, the employer implements a change schedule for canisters and cartridges that will ensure that they are changed before the end of their service life and describes in the respirator program the information and data relied upon and basis for the change schedule and reliance on the data.

- For protection against particulates, the employer shall provide:
 - an atmosphere-supplying respirator; or
 - an air-purifying respirator equipped with high efficiency particulate air (HEPA) filters certified by NIOSH under 30 CFR Part 11 or with filters certified for particulates under 42 CFR Part 84; or
 - an air-purifying respirator equipped with any filter certified for particulates by NIOSH for contaminants consisting primarily of articles with mass median aerodynamic diameters of at least 2 micrometers.

(e) Medical Evaluation

- Must provide a medical evaluation to determine employee's ability to use a respirator, **before fit testing and use.**
- Must identify a **physician or other licensed health care professional (PLHCP)** to perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire (information required is contained in mandatory Appendix C).
- Must obtain a **written recommendation** regarding the employee's ability to use the respirator from the PLHCP.
 - Additional medical evaluations are required under certain circumstances, e.g.:
 - employee reports medical signs or symptoms related to ability to use respirator;
 - PLHCP, program administrator, or supervisor recommends reevaluation;
 - information from the respirator program, including observations made during fit testing and program evaluation, indicates a need; or
 - change occurs in workplace conditions that may substantially increase the physiological burden on an employee.
- Annual review of medical status is not required.

(f) Fit Testing

- All employees using a **negative or positive pressure tight-fitting facepiece** respirator must pass an appropriate **qualitative fit test (QLFT) or quantitative fit test (QNFT)**.
- Fit testing is required prior to initial use, whenever a different respirator facepiece is used, and **at least annually thereafter**. An additional fit test is required whenever the employee reports, or the employer or PLHCP makes visual observations of, changes in the employee's physical condition that could affect respirator fit (e.g., facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight).
- The fit test shall be administered using an OSHA-accepted QLFT or QNFT protocol, as contained in mandatory Appendix A.
 - QLFT Protocols:
 - Isoamyl acetate
 - Saccharin
 - Bitrex
 - Irritant smoke
 - QNFT Protocols:
 - Generated Aerosol (corn oil, salt, DEHP)
 - Condensation Nuclei Counter (PortaCount)
 - Controlled Negative Pressure (Dynatech FitTester 3000)
 - Controlled Negative Pressure (CNP) REDON
- QLFT may only be used to fit test negative pressure air-purifying respirators (APRs) that must achieve a fit factor of 100 or less.
- If the fit factor determined through QNFT is ≥ 100 for tight-fitting half facepieces, or ≥ 500 for tight-fitting full facepieces, the QNFT has been passed with that respirator.

Note: If a particular OSHA standard (e.g., 29 CFR 1910.1001 Asbestos) requires the use of a full facepiece APR capable of providing protection in concentrations up to 50 times the Permissible Exposure Limit (PEL), this respirator must be QNFT. This is because a protection factor of 50 (50 X PEL) multiplied by a standard safety factor of 10 is equivalent to a fit factor of 500.

The safety factor of 10 is used because protection factors in the workplace tend to be much lower than the fit factors achieved during fit testing. The use of a safety factor is a standard practice supported by most experts to offset this limitation. This is discussed in the record at 63 FR 1225.

(g) Use of Respirators

- Tight-fitting respirators shall not be worn by employees who have facial hair or any condition that interferes with the face-to-facepiece seal or valve function.
- Personal protective equipment shall be worn in such a manner that does not interfere with the seal of the facepiece to the face of the user.
- Employees shall perform a user seal check **each time they put on a tight-fitting respirator** using the procedures in mandatory Appendix B-1 or equally effective manufacturer's procedures.
- Procedures for respirator use in IDLH atmospheres are stated. In addition to these requirements, interior structural firefighting requires the use of SCBAs and a protective practice known as "2-in/2-out" — at least two employees must enter and remain in visual or voice contact with one another at all times, and at least two employees must be located outside. (Note that this is not meant to preclude firefighters from performing emergency rescue activities before an entire team has assembled.)

(h) Maintenance and Care of Respirators

Must clean and disinfect respirators using the procedures in Appendix B-2, or equally effective manufacturer's procedures at the following intervals:

- as often as necessary to maintain a sanitary condition for exclusive use respirators,
- before being worn by different individuals when issued to more than one employee, and
- after each use for emergency use respirators **and those used in fit testing and training.**

(i) Breathing Air Quality and Use

Compressed breathing air shall meet the requirements for Type 1-Grade D breathing air as described in ANSI/CGA Commodity Specification for Air, G-7.1-1989.

(j) Identification of Filters, Cartridges, and Canisters

- All filters, cartridges, and canisters used in the workplace must be labeled and color coded with the NIOSH approval label.
- The label must not be removed and must remain legible.

(k) Training and Information

- Must provide effective training to respirator users, including:
 - why the respirator is necessary and how improper fit, use, or maintenance can compromise the protective effect of the respirator
 - limitations and capabilities of the respirator
 - use in emergency situations

- how to inspect, put on and remove, use and check the seals
- procedures for maintenance and storage
- recognition of medical signs and symptoms that may limit or prevent effective use
- general requirements of this standard
- Training required prior to initial use, unless acceptable training has been provided by another employer within the past 12 months.
- **Retraining required annually** and when:
 - workplace conditions change,
 - new types of respirator are used, or
 - inadequacies in the employee's knowledge or use indicates need.
- The basic advisory information in Appendix D shall be provided to employees who wear respirators when their use is not required.

(l) Program Evaluation

Employer must conduct evaluations of the workplace as necessary to ensure proper implementation of the program, and consult with employees to ensure proper use.

(m) Recordkeeping

- Records of medical evaluations must be retained and made available per 29 CFR 1910.1020.
- A record of fit tests must be established and retained until the next fit test.
- A written copy of the current program must be retained.