



California State University
Dominguez Hills

RESPIRATORY PROTECTION SAFETY PLAN

MAY 2010

CALIFORNIA STATE UNIVERSITY, DOMINGUEZ HILLS
(CSUDH, the University)

This Respiratory Protection Safety Plan is written in compliance with California Code of Regulations Title 8, Section 5144. The plan has been developed to assist with developing Safety awareness and employee regulatory compliance regarding the performing of work tasks that require respiratory protection on or near the campus of California State University, Dominguez Hills in Carson, CA.

The University acknowledges that there may be hazards on the campus currently that may not have been identified. It is the responsibility of the employee at all times to be on the look-out for such hazards and to communicate them to their supervisor immediately. Compliance by employees to Federal, State, University and local rules and regulations pertaining to Environment, Health and Safety, while performing work at the University is not an option -- It is a requirement.

The regulatory codes or programs mentioned in this document are intended only as a guide or reference for employees and are not intended to be inclusive of all the rules and regulations that might affect the subject matter and/or the employee.

It will be the specific responsibility of the employee to verify the regulatory accuracy of this document and to understand the content of the Environment, Health and Safety information provided to them by this University.

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1.0 RESPIRATORY PROTECTION

The Respiratory Protection program at California State University, Dominguez Hills (CSUDH) defines how the university complies with the requirements set forth in the California Code of Regulations (CCR), Title 8, section 5144 and elsewhere regarding the use of respiratory protection by university employees. This program follows exactly the hierarchy of controls as detailed in regulation and by recognized industry practice. The order of those controls is as follows:

- Engineering Controls, where the university will seek to confine the process that produces the exposure to an employee in a device that captures the harmful products and completely isolates the employee from the hazard, and;
- Administrative Controls, where the university will seek to use the most benign materials possible so as to not require employees to wear respiratory protection;
- Finally, after both administrative or engineering controls have failed to reduce or eliminate the hazardous exposure, a respirator will be issued to the employee, while the university continues to seek a remedy with either new administrative or engineering controls

1.1 Revision History – Written Plan

Date	Rev. No.	Change	Ref. Section
Nov. 2009	N/A	New Document	N/A

2.0 DEFINITIONS

The following definitions are important terms used in the CSUDH Respiratory Protection Program, and by Cal/OSHA's respiratory protection standard, GISO, Title 8, section 5144.

2.1 Air-purifying respirator

A respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element

2.2 Assigned protection factor (APF)

Workplace level of respiratory protection that a respirator of class of respirators is expected to provide to employees when the employer implements a continuing, effective respiratory protection program as specified by 29 CFR 1910.134

2.3 Atmosphere-supplying respirator

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

2.4 Canister or cartridge

Container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container

2.5 Demand respirator

Atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation

2.6 Emergency situation

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

2.7 Employee exposure

Exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection

2.8 End-of-service-life indicator (ESLI)

System that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.

2.9 Escape-only respirator

Respirator intended to be used only for emergency exit.

2.10 Filter or air purifying element

Component used in respirators to remove solid or liquid aerosols from the inspired air

2.11 Filtering facepiece (single use respirator)

Negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium

2.12 Fit factor

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

2.13 Fit test

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) and see Appendix 4.4

2.14 Helmet

A rigid respiratory inlet covering that also provides head protection against impact and penetration

2.15 P100

Formerly known as High efficiency particulate air (HEPA) filter, a filter that is at least 99.97% efficient in removing monodispersed particles of 0.3 micrometers in diameter

2.16 Hood

A respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso

2.17 Immediately dangerous to life or health (IDLH)

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

2.18 Interior structural firefighting

The physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage

2.19 Loose-fitting facepiece

A respiratory inlet covering that is designed to form a partial seal with the face.

2.20 Maximum use concentration (MUC)

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

2.21 Medical Evaluation

Using a respirator may place a physiological burden on employees that varies with the type of respirator worn, the job and workplace conditions in which the respirator is used, and the medical status of the employee – accordingly, Cal/OSHA specifies the minimum requirements for medical evaluation that employers must implement to determine the employee's ability to use a respirator; medical examination components vary according to the type of respirator required

2.22 Negative pressure respirator (tight fitting)

Respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator

2.23 Oxygen deficient atmosphere

An atmosphere with oxygen content below 19.5% by volume

2.24 Physician or other licensed health care professional (PLHCP)

Individual whose legally permitted scope or 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 subsection (e) of 5144

2.25 Positive pressure respirator

Respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator

2.26 Powered air-purifying respirator (PAPR)

Air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering

2.27 Pressure demand respirator

Positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation

2.28 Qualitative fit test (QLFT)

Pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.

2.29 Quantitative fit test (QNFT)

An assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator

2.30 Respiratory inlet covering

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

2.31 Self-contained breathing apparatus (SCBA)

An atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user

2.32 Service life

The period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer

2.33 Supplied-air respirator (SAR) or airline respirator

Atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user

2.34 Tight-fitting facepiece

Respiratory inlet covering that forms a complete seal with the face

2.35 User seal check

An action conducted by the respirator user to determine if the respirator is properly seated to the face

3.0 POLICY

3.1 RESPONSIBILITIES

The CSUDH Respiratory Protection Program makes all possible arrangements to ensure that engineering and administrative controls are implemented to minimize the use of respiratory protective equipment and exposure to airborne contaminants. In the event those options are exhausted, or in the case of emergencies, respiratory protection will be used by University employees. The use of that protection is directed and governed by this plan.

3.1.1 RM / EHOS Department Staff

- Designate a qualified program administrator to conduct the program and required evaluations of program effectiveness
- Develop, implement and monitor the Respiratory Protection Plan in compliance with California Code of Regulations Title 8, Section 5144
- Provide guidance and assist departments in complying with program requirements on a consulting basis
- Review and approve all University purchases of respiratory protective equipment
- Provide applicable training on the need for respiratory protection, criteria for selecting respirators and respirator fitting/use/maintenance
- Develop and implement a campus wide medical monitoring program for respirator users

- Conduct at least annual audits for respiratory equipment usage, maintenance, and storage
- Maintain records indicating the brand and type of respirator used by each employee, the date the employee was fit tested, and the date the employee received respirator use training
- Conduct monthly inspections of all Self Contained Breathing Apparatus units
- Conduct periodic training sessions concerning respirator program elements
- Conduct at least an annual review of this program
- Assist departments in selecting appropriate engineering and/or administrative controls **prior** to determining the applicable respiratory protective equipment

3.1.2 University Departments

- Determine what specific applications require the use of respiratory equipment and contact the RM / EHOS Department for assistance in this task
- Provide proper respiratory equipment (with the assistance of the RM / EHOS Dept.) to meet the needs of each specific application
- Ensure that appropriate employees are provided with adequate training and instructions on all equipment and that all personnel are completely knowledgeable of the respirator usage requirements for the areas in which they work; The RM / EHOS Dept. specializes in conducting instructional, regulatory and compliance training for the University staff employees
- Ensure that the personnel comply with all elements of the University Respiratory Protection Program, including respirator inspection and maintenance
- Periodically spot-check field use by staff within their respective department(s) to ensure compliance and safe use of the specified and required safety equipment; RM / EHOS Dept. staff can assist with this task

3.1.3 University Employees

- Use common sense and good judgment at all times
- Understand the hazards that exist or may be created by the work task(s) and/or the work environment to which they are assigned and contact the RM / EHOS Dept. for assistance and clarification if the employee does not fully understand, or is not fully aware of the hazards
- Comply with all procedures, whether written or oral, while performing assigned duties
- Immediately inform the supervisor if a procedure or process seems unsafe
- Complete the prescribed fit-testing protocol as required by this plan prior to using a respirator
- Utilize respiratory protective equipment in accordance with manufacturer requirements and training provided by the University
- Inform the supervisor of any personal health problems that could be aggravated by the use of respiratory protective equipment
- Guard against damage and ensure that respirators are not disassembled, modified, or otherwise altered in any way other than by the changing of the respirator cartridges/ filters and applicable respirator parts (e.g., valve covers and head straps)
- Report any observed or suspected malfunctions of the respirator equipment to the supervisor

- Use only types of respiratory protection equipment that has been approved and training has been provided for
- Conduct positive and negative pressure fit tests prior to each respirator use
- Ensure that the issued respirator is inspected, cleaned, disinfected, repaired, and stored in accordance with manufacture requirements and University training

3.2 MEDICAL MONITORING

A complete medical monitoring system is in place for all University employees whose position requires use of a respirator.

3.2.1 Monitoring Program

- Identifies the employees that may require periodic medical monitoring because of their routine assignments
- Employees should not be assigned to tasks requiring the use of respirators unless it has been determined that they are physically able to perform the work while using the respiratory equipment. These assessments and /or examinations will be conducted by the Physician or other Licensed Health Care Provider (PLHCP) charged with this duty.
- Complies with federal and state programs designed to use administrative and engineering controls to minimize exposures.
- Failure or refusal to comply with or to submit to a confidential medical evaluation as required by regulation and University policy shall constitute a failure or refusal to perform a normal and reasonable duty of the employee's assigned position.
- CSUDH shall provide a confidential medical evaluation to determine the employee's ability to use a respirator. This shall be completed before the employee is fit tested or required to use the respirator. CSUDH may discontinue an employee's medical evaluations when the employee is no longer required to use a respirator.
- The cost of the program and medical evaluation is assumed by the University.

Administration of the medical questionnaire (see Appendix) and examinations shall be implemented as follows:

- The medical questionnaire and examinations shall be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee.
- The medical questionnaire shall be administered in a manner that ensures that the employee understands its content.
- A copy of the questionnaire shall be provided by CSUDH to the employee, to be completed and sent directly to the PLHCP. The PLHCP address and cover letter are provided with each questionnaire (see Appendix).

Medical evaluation procedures are as follows:

- CSUDH shall identify a PLHCP to perform medical evaluations using a **medical questionnaire** or an initial medical examination that obtains the same information as the medical questionnaire.
- CSUDH shall provide the employee with an opportunity to discuss the questionnaire and examination results with the PLHCP.
- The medical evaluation shall obtain the information requested by the questionnaire in accordance with the provisions of CCR Title 8 Section 5144, Appendix C. (Attached and highlighted) **need?**

- CSUDH will ensure that a follow-up medical examination is provided for an employee who gives a positive response to any question among questions 1 through 8 in Section 2, Part A of Appendix C (Highlighted gray section of the form) or whose initial medical examination demonstrates the need for a follow-up medical examination at no cost to the employee. This process will be initiated by the PLHCP after the questionnaire has been reviewed.
- The follow-up medical examination shall include any medical tests, consultations, or diagnostic procedures that the PLHCP deems necessary to make a final determination.
- Results of the questionnaire and any follow-up examinations will be confidential between the PLHCP and the employee.

CSUDH will provide the PLHCP with the following information as part of the evaluation related to an employee's ability to use a respirator:

- The type and weight of the respirator to be used by the employee;
- The duration and frequency of respirator use (including use for rescue and escape);
- The expected physical work effort;
- Additional protective clothing and equipment to be worn; and
- Temperature and humidity extremes that may be encountered.
- Any supplemental information provided previously to the PLHCP regarding an employee need not be provided for a subsequent medical evaluation if the information and the PLHCP remain the same. Additionally, a copy of the University's current Respiratory Protection Program will be provided to the PLHCP.

NOTE: When the employer replaces a PLHCP, the employer must ensure that the new PLHCP obtains this information, either by providing the documents directly to the PLHCP or having the documents transferred from the former PLHCP to the new PLHCP. Also, Cal/OSHA does not expect employers to have employees medically reevaluated solely because a new PLHCP has been selected.

CSUDH will receive the following medical determination provided directly from the PLHCP:

- A written opinion regarding the employee's ability to use the respirator from the. The written opinion shall provide only the following information:
- Any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which the respirator will be used, including whether or not the employee is medically able to use the respirator;
- The need, if any, for follow-up medical evaluations; and
- A statement that the PLHCP has provided the employee with a copy of the PLHCP's written recommendation.

NOTE: If the respirator is a negative pressure respirator and the PLHCP finds a medical condition that may place the employee's health at increased risk if the respirator is used, the employer shall provide a (Powered Air Purifying Respirator (PAPR) if the PLHCP's medical evaluation finds that the employee can use such a respirator. If a subsequent medical evaluation finds that the employee is medically able to use a negative pressure respirator, then the employer is no longer required to provide a PAPR.

Medical Re-Evaluation If a re-evaluation is deemed necessary by the PLHCP, that evaluation will be provided for by the employer at no charge to the employee.

- Each CSUDH employee covered by this program shall receive an annual medical re-evaluation to ascertain their ability to wear a respirator. The examination will be completed at no charge to the employee and it will be performed during normal business hours or at the convenience of the employee.

Biological Monitoring:

- Biological monitoring in the form of blood, tissue and/ or urinary analysis will be conducted as determined by the PLHCP.

Note: Complete medical testing parameters, including medical evaluation of cardiac status, pulmonary status, physical ability (bending at waist, bending at knees, etc.), and any laboratory tests either required by regulation or recommended by the PLHCP can be found in the University Medical Monitoring Program.

3.3 EMPLOYEE TRAINING

- RM / EHOS will train employees to identify hazards and work areas that may require the use of respiratory protection and how to use respiratory protection to mitigate any potential exposure. This instruction must be documented (see Appendix 4.3).

Education and training will consist of:

- Procedures for use of job specific respiratory equipment provided by the University.
- Descriptions for the need of respiratory protection.
- The proper use of respirators, including normal use and use during foreseeable and unforeseen emergencies.
- The limitations of respirators.
- The care and maintenance of the applicable respirator(s).
- The conditions under which employees may use respirators when none are required by regulation, and when they may use their own respiratory equipment.
- When training is required as detailed in CCR, T8, 5144.
- Where, when and who conducts respirator fit testing as required by CCR, T8, 5144.

3.4 RESPIRATOR – SELECTION, APPROVAL AND PROCUREMENT

RM / EHOS will assist all departments in determining the appropriate respiratory protective equipment. The following procedures shall apply:

- Proper selection of respirators **shall** be made by each department in consultation with RM / EHOS.
- **Only** respirators certified by **NIOSH shall** be used to comply with the requirements of this program.
- Only parts approved by the manufacturer for the specific respirator system shall be used for replacement.
- Departments are responsible for insuring that an adequate stock of respirators, filters and/or cartridges is maintained.
- All University departments seeking to purchase respirators for employee use **shall** complete a departmental requisition and forward it to the University Purchasing office. Purchasing **will** consult with RM / EHOS regarding approval. If RM / EHOS have not been previously consulted regarding the department requisition, purchase approval will be delayed until RM / EHOS can complete a determination that administrative or

engineering control options have been explored and respiratory protective equipment is required.

3.5 NON-MANDATED RESPIRATOR USE

The University may provide respirators at the request of employees but will not allow the employees to use their own personally-supplied respirators. If the University determines that any voluntary respirator use is permissible, it shall provide the respirator users with the information contained in Appendix D of CCR; T8 5144 of this highlighted section below ("Information for Employees Using Respirators When Not Required Under the Standard.").

Appendix D to Section 5144 (Mandatory) Information for Employees Using Respirators When Not Required Under the Standard

- ❖ 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.

You 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.

3.6 OPERATING PROCEDURES

The operating instructions for each type of respirator and information on the limits of each must be followed carefully to gain the maximum benefit and protection.

Filtering Facepiece (aka dust mask or single use disposable respirator: negative pressure)

- There are various types of filtering facepieces including disposable dust masks that have been approved for exposures to low concentrations of certain dusts.
- There are limitations on filtering facepieces and they cannot be used in oxygen deficient atmospheres. Nor can they be worn for protection in toxic environments.

Donning Instructions:

- Ensure that the skin around the sealing area of the mask is clean and for males, clean shaven.
- Select a respirator of the appropriate size for the face.
- Place the respirator against the face, with the straps on the outside of the mask
- With one hand, expand the upper strap and stretch it over the crown of the head, placing it so the strap holds the mask from the back of the head.
- With one hand, expand the lower strap and stretch it to a position of comfort below the first strap position (this is usually around the base of the neck).
- Both straps must be in place for the mask to provide the designed protection.
- Ensure that, if equipped, the adjustable nose clip is pinched so that a tight seal is achieved.
- Perform a user seal check to ensure proper fit. If the respirator fails the seal check, discard it and select another type, and complete the above steps in order.
- Wear the respirator for one full 8 hour shift. Do not reuse the respirator if the need extends beyond one shift.
- If breathing through the respirator becomes difficult, or if the respirator becomes contaminated, or if the respirator fails in any way, exit the area of use, discard the non-functioning respirator, and inform your supervisor regarding the incident.

Tight Fitting Respirators (Negative Pressure)

Employees using tight fitting respirators will perform the following checks prior to completing tasks requiring the use of tight fitting respirators.

Fit Check

- Negative Pressure Fit Check: the employee closes off the respirator inlet and inhales. A vacuum and partial inward collapse of the mask should result. If a vacuum can not be maintained for at least ten seconds, readjust the face piece and try again.
- Positive Pressure Fit Check: the employee closes off the exhalation valve and breathes out gently. Air should escape through any gaps in the seal. If a slight positive pressure cannot be maintained with out escape of the air for at least ten seconds, readjust the face piece and try again.

Air Purifying Half – Face Respirators (negative pressure)

- Half – face respirators can be used with a High Efficiency Particulate Air (HEPA) filters. Other cartridges are available that protect against organic and other chemical contaminants.
- Since this type of respirator does **not** supply air, it **cannot** be used in oxygen deficient atmospheres, Immediately Dangerous to Life or Health (IDLH) atmospheres or in confined spaces. It can only be used for contaminants listed on the canister. The employee must leave an area when they detect a taste or smell inside the mask or when breathing resistance increases. The procedures to don the respirator are:
 - Ensure that the skin around the sealing area of the mask is clean and for males, clean shaven.
 - Hold the mask so the narrow nose clip points upward.
 - Grasp both lower mask straps and hook them behind the neck.
 - Grasp both top straps and hook them behind the head and above the ears for proper fit.

- Adjust the straps so the fit is snug but comfortable
- Check for leaks with a fit check, positive and negative.
- Change the filters or cartridges on the half mask respirator when the ESLI (**end of service life indicator**) on the cartridge changes. If there is no ESLI, change the filter/cartridge after each completed task requiring a respirator, or every 8 hours, or whenever the employee tastes or smells the contaminant inside the mask.

Air Purifying Full – face respirators (negative pressure)

- Like half –face respirators, these respirators do **not** supply air and **cannot** be used in oxygen deficient atmospheres, IDLH atmospheres or confined spaces. The employee **must** leave an area in which they detect a taste or smell inside the mask or when breathing resistance increases.
- Full –face respirators provide more protection than half – face respirators because their shape allows a better mask to face seal. They also protect the eyes from irritating vapors/dusts and physical impacts.
- Full – face respirators also come with selective types of filters and canisters that are effective against a singular or general category of contaminants. Full – face respirators have the similar limitations to half – face respirators. Additionally, standard eyeglasses interfere with the mask to face seal and therefore manufacturer-specific spectacle kits must be provided for employees requiring corrective eyewear to use such a respirator. This must be communicated to the employee's supervisor **prior to use**. RM / EHOS may assist the supervisor in this regard.
- Change the filters or cartridges on the half mask respirator when the ESLI (**end of service life indicator**) on the cartridge changes. If there is no ESLI, change the filter/cartridge after each completed task requiring a respirator, or every 8 hours, or whenever the employee tastes or smells the contaminant inside the mask.

To don a full – face respirator:

- Loosen all straps, pull the harness over the head, and place the chin in the chin cup.
- Pull the head harness will down on the back of the head.
- Tighten the harness gently, starting with the bottom straps and then the middle straps and last the top straps.
- Check the fit by completing a positive/negative fit check:
- **Positive fit check:** close off the inhalation grids on the front of the filter(s)/canister(s) and gently inhaling. The mask should slightly collapse in toward the user. The employee should hold their breath for a few seconds to maintain a collapsed mask during this time. If the mask does not collapse inward, remove, readjust, and re-position the mask on the face and retest.
- **Negative fit check:** close off the exhalation port on the mask and exhale gently. The mask should inflate slightly but evenly in all directions. If the mask does not inflate equally, remove, readjust, and reposition the mask and retest.

Supplied Air Respirators – This type of Respirator is Not Allowed to Be Used by CSUDH Employees

Supplied air respirators are defined as respirators that provide the atmosphere to the user. The two types of supplied respirator systems are either a self-contained breathing apparatus (air source carried by the user) or an air line respirator (air source supplied to the user by an air line).

- **Self-Contained Breathing Apparatus (SCBA) – Not Allowed to be Used by CSUDH Employees**
 - SCBA units provide the user with a pure supply of grade “D” breathing air regardless of external conditions. They must be used in atmospheres unsuitable for air purifying respirators. This includes IDLH atmospheres, confined spaces where positive ventilation cannot remove or reduce the contaminant, and emergencies where airborne hazards are known to exist but cannot be quantified.
 - The air supply in a SCBA is usually 30 or 60 minutes depending on the bottle capacity. Heavy exertion and stress will significantly reduce this amount of time. An alarm bell sounds when five minutes of oxygen air remaining in the bottle and the wearer must leave the area immediately. If SCBA equipment must be used for entry, assessment, or emergency mitigation, two persons shall be equipped with SCBA units, and the appropriate level of protective clothing. Two persons will be on standby outside the work area to assist or recover the two entry personnel.

Specialized Respiratory Protective Equipment (Type C Supplied Air Respirators)

- ❖ **Use of a pressure demand, Type C airline system respiratory protection equipment is Not Allowed to be used by CSUDH employees.**

3.7 MAINTENANCE AND CARE

Degradation of the effectiveness and possible contamination of respirators can occur if proper care and maintenance are neglected.

3.7.1 Inspection

- Examine the conditions of the mask, straps, valves (inhalation and exhalation), and filter elements before and after each use and during cleaning.
- Examine the condition of the air hose, hose clamps and gaskets before and after each use and document the findings.
- Examine the face piece, closely evaluate the condition of the rubber and/or the condition of the clear lens (if a full face or SCBA mask).
- Inspect for cleanliness, document findings.
- Inspect the face piece and respirator cartridges for a NIOSH designation.
- Remove any equipment from service until it is repaired and certified for use.

3.7.2 Cleaning

- After removing the filter and or straps, immerse the respirator in a mild bleach solution or immerse the respirator in a sanitary solution recommended by the manufacturer for at least two minutes.
- After washing or immersing the respirator, rinse it thoroughly in clean water to prevent dermatitis from residue on the mask.
- Allow the mask to air dry.

3.7.3 Storage

- Respirators can be permanently damaged if they are not stored properly. After use, clean, sanitize, and store respirators in re-sealable plastic bags.
- Protect respirators from sunlight, dust, chemicals, latent moisture and extreme temperatures.
- Do not store the respirator in a manner that forces it out of its natural shape. Stuffing a respirator into a space or container too small for the mask will distort the mask, and will affect the fit of the unit to the wearer.

3.7.4 Repair

- Report all mal-functioning respirators to your supervisor and RM / EHOS.
- Do **not** attempt to repair a respirator if you have not been trained to do so.
- If repair is required, use **only** replacement parts from the **same** manufactured brand and type of equipment.

3.8 EMERGENCY USE – RESPIRATORS

An emergency as defined in Cal – OSHA is “an unforeseen combination of circumstances that calls for immediate action.” An “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.”

3.8.1 Emergency Situations

University employees are not allowed to subject themselves and/or their employees to hazardous airborne conditions in an emergency situation. They are not equipped and they are not specifically trained to respond such emergencies. Respiratory hazards often occur during emergencies when police or other emergency service personnel need immediate entry into a fire or accident scene. Other types of breathing hazards may occur when personnel are exposed to hazardous substances while trapped by an accident or escaping from the scene of a fire or accident, or when they are exposed to hazardous material spills. An unforeseen chemical reaction may also result in an over exposure to hazardous substances.

3.8.1.1 Acceptable Types of Equipment During Emergencies

Each respiratory device has a limited ability to protect health. During emergency entry, when there is usually neither time nor opportunity to evaluate the degree of exposure, only SCBA operating in the pressure demand mode should be used. CSUDH does not own, operate and/or use SCBA equipment. Only SCBA respirator equipment is approved for use in emergency situations and atmospheres.

3.8.2 Reports

Following any incident where respirator protective equipment has been used, RM / EHOS shall be notified in writing, as soon as possible.

3.9 RECORDKEEPING

- Records of respirator training and fit testing are maintained by RM / EHOS.

- Monthly checks of Emergency Use Respirators (if they are owned and/or stored on campus) will be conducted by the respiratory program administrator. These records will be kept for three years.

3.9.1 PROGRAM EVALUATION

- The effectiveness of the Respiratory Protection Program will be evaluated annually by comprehensive examination of employees in the program.
- A 15 question review of program elements and operational requirements will be developed from a pool of appropriate questions. (see Appendix 4.2)
- The examination will be administered during the annual fit test period for each employee.
- The examination will be customized to conform to each specific trade, or user profile.
- There will be no passing score, but refresher training will be required for those employees scoring below 70%
- Examinations will be kept on file for three years.

4.0 APPENDIX

4.1 RESPIRATOR MEDICAL EVALUATION QUESTIONNAIRE

RESPIRATORY PROTECTION PROGRAM Respirator Medical Evaluation Questions

To the employee: Can you read (circle one): Yes / No

the employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Part A. Section 1. (Mandatory) The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date: _____
 2. Your name: _____
 3. Your age (to nearest year): _____
 4. Sex (circle one): Male/Female
 5. Your height: _____ ft. _____ in.
 6. Your weight: _____ lbs.
 7. Your job title: _____
 8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code): _____
 9. The best time to phone you at this number: _____
 10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No
 11. 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-face piece type, powered-air purifying, supplied-air, self-contained breathing apparatus).
 12. Have you worn a respirator (circle one): Yes / No
- If "yes," what type(s): _____
- _____

Part A. Section 2. (Mandatory) Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (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
 - b. Asthma: Yes / No
 - c. Chronic bronchitis: Yes / No
 - d. Emphysema: Yes / No
 - e. Pneumonia: Yes / No
 - f. Tuberculosis: Yes / No
 - g. Silicosis: Yes / No
 - h. Pneumothorax (collapsed lung): Yes / No
 - i. Lung cancer: Yes / No
 - j. Broken ribs: Yes / No
 - k. Any chest injuries or surgeries: Yes / No
 - l. 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 Heart failure: Yes / No
 - d. Swelling in your legs or feet (not caused by walking): Yes / No

- e. Heart arrhythmia (heart beating irregularly): Yes / No
 - f. High blood pressure: Yes / No
 - g. 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 two 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-face piece 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 lbs: Yes / No
 - j. Any other muscle or skeletal problem that interferes with using a respirator: Yes / No

Part B Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen: Yes / No

If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: Yes / No

2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals: Yes / No

If "yes," name the chemicals if you know them: _____

3. Have you ever worked with any of the materials, or under any of the conditions, listed below:

- a. Asbestos: Yes / No
- b. Silica (**e.g.**, in sandblasting): Yes / No
- c. Tungsten/cobalt (e.g., grinding or welding this material): Yes / No
- d. Beryllium: Yes / No
- e. Aluminum: Yes / No
- f. Coal (for example, mining): Yes / No
- g. Iron: Yes / No
- h. Tin: Yes / No
- i. Dusty environments: Yes / No
- j. Any other hazardous exposures: Yes / No

If "yes," describe these exposures: _____

4. List any second jobs or side businesses you have: _____

5. List your previous occupations: _____

6. List your current and previous hobbies: _____

7. Have you been in the military services? Yes / No

If "yes," were you exposed to biological or chemical agents (either in training or combat):
Yes/No

8. Have you ever worked on a HAZMAT team? Yes / No

9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): Yes / No

If "yes," name the medications if you know them: _____

10. Will you be using any of the following items with your respirator(s)?

- a. HEPA Filters: Yes / No
- b. Canisters (for example, gas masks): Yes / No
- c. Cartridges: Yes / No

11. How often are you expected to use the respirator(s) (circle "yes" or "no" for all answers that apply to you)?:

- 4 Escape only (no rescue): Yes / No
- 5 Emergency rescue only: Yes / No
- 6 Less than 5 hours **per week**: Yes / No
- 7 Less than 2 hours **per day**: Yes / No
- 8 2 to 4 hours per day: Yes / No
- 9 Over 4 hours per day: Yes / No

12. During the period you are using the respirator(s), is your work effort:

- a. **Light** (less than 200 kcal per hour): Yes / No

If "yes," how long does this period last during the average shift: _____hrs. _____mins.

Examples of a light work effort are **sitting** while writing, typing, drafting, or performing light assembly work; or **standing** while operating a drill press (1-3 lbs.) or controlling machines.

- b. **Moderate** (200 to 350 kcal per hour): Yes / No

If "yes," how long does this period last during the average shift: _____hrs. _____mins.

Examples of moderate work effort are **sitting** while nailing or filing; **driving** a truck or bus in urban traffic; **standing** while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; **walking** on a level surface about 2 mph or

down a 5-degree grade about 3 mph; or **pushing** a wheelbarrow with a heavy load (about 100 lbs.) on a level surface. **Heavy** (above 350 kcal per hour): Yes / No

If "yes," how long does this period last during the average shift: _____hrs. _____mins.

Examples of heavy work are **lifting** a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; **shoveling; standing** while bricklaying or chipping castings; **walking** up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator: Yes / No

If "yes," describe this protective clothing and/or equipment: _____

14. Will you be working under hot conditions (temperature exceeding 77 deg. F): Yes / No

15. Will you be working under humid conditions: Yes / No

16. Describe the work you'll be doing while you're using your respirator(s):

17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases):

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):

Name of the first toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

Name of the second toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

Name of the third toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

The name of any other toxic substances that you'll be exposed to while using your respirator:

19. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, and security):

4.2 Evaluation Questions (Annual Review Period)

- Why is a respirator needed for your job or process?
- Why will improper fit, usage, or maintenance compromise the effectiveness of the respirator?
- What are the limitations and capabilities of your respirator?
- What should you do if there is an emergency situation regarding your respirator?
- What should you do if your respirator malfunctions?
- What are the critical steps necessary when putting your respirator on?
- What are the critical steps when removing your respirator?
- What are the critical elements involved in inspecting your respirator prior to use?
- What is the proper method for storing your respirator?
- Describe the maintenance routine for evaluating the effectiveness of your respirator?

List some of the medical signs and symptoms that could prevent effective use of your respirator. Answer the following questions either True (T) or False (F).

- Wearing a beard will not affect the fit factor of a tight fitting respirator.
- Tight fitting negative air purifying respirators can be used in oxygen deficient atmospheres.
- I may bring any respirator I choose from home to use on the job.
- All respirators must be certified by OSHA.

4.3 TRAINING AND INSTRUCTION DOCUMENTATION FORM

RESPIRATORY PROTECTION Training Record Form

Date: _____

Subject: _____

Location: _____

Instructor: _____

	Print Name	Signature
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

4.4 RESPIRATOR FIT TEST PROTOCOL

Respirator fit tests are essential to ensuring that a respirator forms a good seal against the user's face and prevents contaminants from leaking into the mask. It is also a regulatory requirement for proper respirator use. Each manufacturer provides fitting instructions and use limitations on the product package. Respirator face pieces are made in various sizes to fit a wide variety of face shapes and sizes. Some workers simply will not be able to get a good seal with any available respirator and should not be assigned to duties requiring respiratory protection. This problem can be acute for negative pressure respirators.

- Tight Fitting Respirators (negative pressure):
 - Fit testing **shall** be conducted by RM / EHOS **prior** to issuance of a respirator, and annually thereafter.
 - Quantitative Fit Testing Procedures:
 - The University may, at its discretion, contract with an external provider for this service.
 - The University shall employ quantitative fit testing as the primary tool for assessing proper fit for tight fitting respirators. The equipment used for this purpose will be a controlled negative pressure (CNP) fit test apparatus, Fit Test 3000, currently manufactured by Occupational Health Dynamics.
 - The procedures for conducting quantitative fit tests using the Fit Test 3000 are internally contained within the unit software. They are identical to the requirements under CCR Title 8, section 5144, Appendix A - Fit Test Procedures.
 - The following list of exercises is analogous to the exercises listed in CCR title 8 Section 5144, Appendix A, and will be successfully completed by all employees required to wear tight fitting respirators:
 1. Normal breathing
 2. Deep breathing
 3. Turning head side to side
 4. Moving head up and down
 5. Talking
 6. Grimace
 7. Normal breathing
 - The minimum acceptable fit factors for employees using tight fitting respirators are **100** for a half - face negative pressure respirators, and **500** for full - face negative pressure respirators.
 - Alternative test protocols, approved by NIOSH and accepted by Cal/OSHA, may be used by RM / EHOS.
 - Qualitative Fit Testing
If, during equipment failures, quantitative fit testing cannot be applied to employees requiring the use of tight fitting respirators, qualitative fit testing shall be employed, using any agent and procedure detailed in Appendix A of this document.

The employee shall properly don the respirator and wear it for at least ten minutes prior to commencing the fit test.

RM / EHOS shall review this protocol with the employee prior to testing.

The employee shall perform the conventional positive pressure and negative pressure fit tests as later described.

A totally enclosed hood shall not be used to conduct irritant smoke (stannic chloride) fit tests.

RM / EHOS shall use an approved "smoke tube" for testing the seal with an aspirator around the employee's donned respirator or may use a computerized device in lieu of the irritant smoke.

RM / EHOS shall inform the employee of the irritant smoke properties and advise the employee that their eyes should remain closed during the test.

RM / EHOS will direct the stream of smoke towards the faceshield until it is within one inch of the faceshield, moving around the seal, asking the employee if they have detected the smoke.

The Smoke Test will continue for at least one minute per exercise

The following exercises will be performed with the smoke:

- Normal Breathing
- Deep Breathing
- Turning head side to side
- Moving head up and down
- Talking (rainbow passage)

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The Rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend a boiling pot of gold at one end. People look but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

- Grimace
- Bending Over
- Normal Breathing
- Jogging in place
- Normal breathing

If the irritant smoke produces a cough or is detected by the employee, the test will stop. Another respirator will be selected and re-tested.

When the test is passed, the employee will be given a sensitivity test to the smoke. Failure to react to the irritant smoke will void the test.

Employees passing the test may use respirators in atmospheres up to ten times the Personnel Exposure Limit (PEL)

All Single Use Respirators (Filtering Facepieces)

Saccharin Solution Aerosol Test

If, during equipment failures, quantitative fit testing cannot be applied to employees requiring the use of tight fitting respirators, qualitative fit testing shall be employed, using the saccharin solution aerosol test procedure detailed in CCR Title 8, sec 5144 Appendix A.

Sensitivity test - This test is conducted to assure that the individual being fit tested can detect the taste of the test solution at very low levels. The test subject should not eat, drink or chew gum for fifteen minutes prior to the test.

- The employee dons the fit test hood (3M FT 14/15) without a respirator in place.
- The employee is instructed to breathe through the mouth only.
- The solution is injected into the hood with ten squeezes of the injection bulb.

- The employee is asked if they can detect the taste of the solution. If tasted, the number of squeezes is noted and the fit test is initiated.
- If the taste is not detected, another ten squeezes are injected into the hood until thirty squeezes are achieved, if the employee does not detect the taste the test is terminated and the employee is not cleared to use a single use respirator.
- If the above threshold test is successful, and the employee is able to detect the presence of saccharin solution, the following fit test protocol shall be used.
- The employee shall not eat or drink anything, except plain water, for 15 minutes prior to the test.
- The employee dons the selected respirator and dons the fit test enclosure hood.
- A minimum of 10 squeezes of the fit test saccharin solution is introduced into the enclosure.
- The following exercises are performed:
 - Normal Breathing
 - Deep Breathing
 - Turning head side to side
 - Moving head up and down
 - Talking (rainbow passage)
 - Grimace
 - Bending Over
 - Normal Breathing
 - " The Rainbow Passage"

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The Rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend a boiling pot of gold at one end. People look but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

A fit test is successful if the entire routine results in the subject not reporting the taste of saccharin.

Fit testing - Isoamyl Acetate

- The employee is instructed to don the respirator.
- The employee then dons the test hood.
- Using the bulb from the previous test, inject the same number of squeezes as was injected in the sensitivity test.
- Maintain an adequate concentration of the aerosol by injecting at least half of the squeezes in the first thirty seconds.
- After the aerosol is fully injected, perform the following exercises for sixty second each:
 - Normal breathing
 - Deep breathing
 - Turning head side to side
 - Nodding head up and down
 - Read the "Rainbow Passage"

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The Rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend a boiling pot of gold at one end. People look but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

- Normal breathing

Terminate the test at any time when the aerosol is tasted.

If the test is completed without the taste being detected, the fit is deemed adequate.

Fit Testing - Bitrex

Bitrex™ (Denatonium Benzoate) Solution Aerosol Qualitative Fit Test Protocol. The Bitrex™ (Denatonium benzoate) solution aerosol QLFT protocol uses the published saccharin test protocol because that protocol is widely accepted. Bitrex is routinely used as a taste aversion agent in household liquids which children should not be drinking and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

- a. Taste Threshold Screening. The Bitrex taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of Bitrex.
 1. During threshold screening as well as during fit testing, subjects shall wear an enclosure about the head and shoulders that is approximately 12 inches (30.5 cm) in diameter by 14 inches (35.6 cm) tall. The front portion of the enclosure shall be clear from the respirator and allow free movement of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts #14 and #15 combined, is adequate.
 2. The test enclosure shall have a 3/4 inch (1.9 cm) hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.
 3. The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his or her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a bitter taste.
 4. Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the Threshold Check Solution into the enclosure. This Nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.
 5. The Threshold Check Solution is prepared by adding 13.5 milligrams of Bitrex to 100 ml of 5% salt solution in distilled water.
 6. To produce the aerosol, the nebulizer bulb is firmly squeezed so that the bulb collapses completely, and is then released and allowed to fully expand.
 7. An initial ten squeezes are repeated rapidly and then the test subject is asked whether the Bitrex can be tasted. If the test subject reports tasting the bitter taste during the ten squeezes, the screening test is completed. The taste threshold is noted as ten regardless of the number of squeezes actually completed.
 8. If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex is tasted. If the test subject reports tasting the bitter taste during the second ten squeezes, the screening test is completed. The taste threshold is noted as twenty regardless of the number of squeezes actually completed.
 9. If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the Bitrex is tasted. If the test subject reports tasting the bitter taste during the third set of ten squeezes, the screening test is completed. The taste threshold is noted as thirty regardless of the number of squeezes actually completed.
 10. The test conductor will take note of the number of squeezes required to solicit a taste response.
 11. If the Bitrex is not tasted after 30 squeezes (step 10), the test subject is unable to taste Bitrex and may not perform the Bitrex fit test.
 12. If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.
 13. Correct use of the nebulizer means that approximately 1 ml of liquid is used at a time in the nebulizer body.
 14. The nebulizer shall be thoroughly rinsed in water, shaken to dry, and refilled at least each morning and afternoon or at least every four hours.

b. Bitrex Solution Aerosol Fit Test Procedure.

1. The test subject may not eat, drink (except plain water), smoke, or chew gum for 15 minutes before the test.
2. The fit test uses the same enclosure as that described in 4. above.
3. The test subject shall don the enclosure while wearing the respirator selected according to section I. A. of this appendix. The respirator shall be properly adjusted and equipped with any type particulate filter.
4. A second DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent is used to spray the fit test solution into the enclosure. This nebulizer shall not be clearly marked to distinguish it from the screening test solution nebulizer.
5. The fit test solution is prepared by adding 337.5 mg of Bitrex to 200 ml of a 5% salt solution in warm water.
6. As before, the test subject shall breathe through his or her slightly open mouth with tongue extended, and be instructed to report if he/she tastes the bitter taste of Bitrex.
7. The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of the fit test solution is sprayed into the enclosure using the same number of squeezes (either 10, 20 or 30 squeezes) based on the number of squeezes required to elicit a taste response as noted during the screening test.
8. After generating the aerosol, the test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.
9. Every 30 seconds the aerosol concentration shall be replenished using one half the number of squeezes used initially (e.g., 5, 10 or 15).
10. The test subject shall indicate to the test conductor if at any time during the fit test the taste of Bitrex is detected. If the test subject does not report tasting the Bitrex, the test is passed.
11. If the taste of Bitrex is detected, the fit is deemed unsatisfactory and the test is failed. A different respirator shall be tried and the entire test procedure is repeated (taste threshold screening and fit testing).