

**Safety & Risk Management Policies and Procedures**

**Title:** Respiratory Protection Policy  
**Date:** August 2013

**Rationale:** Southwestern University has determined that certain employees (Table 1) may have the potential to be exposed to respiratory hazards during work operations. These hazards may include wood dust, clay dust, particulates, mold spores, welding fumes, paint vapors and other chemical mists or vapors.

**Goals:** The purpose of this program is to prevent occupational disease caused by breathing contaminated air in the workplace. To ensure that employees are protected from over exposure to potential respiratory hazards that can cause adverse health effects.

**Policy:**
- The primary method to reduce employee exposure to respiratory hazards is by utilizing engineering controls (source capture ventilation devices).
- Engineering controls are usually the best method to reduce exposure to respiratory hazards and are designed and installed where known hazards exist and where feasible to install and operate at Southwestern University.
- Product review and substitution to less toxic materials are strongly encouraged and each department is responsible to review and substitute to safer products whenever feasible.
- Respirators and other personal protective equipment are to be used where engineering controls of respiratory hazards are not feasible, while engineering controls are being assessed, designed, and installed, or in emergencies.
- Respiratory protective equipment, replacement parts, training, individualized fit testing services and medical evaluations or exams* will be provided at no cost to our employees.

**Procedure:**
- The administrative duties and responsibilities section outlines specific tasks for administrators, managers/supervisors, and employees.
- The section for medical evaluations provides the procedure for an employee applying for use of a respirator, receiving a written medical recommendation, and criteria for qualifying for further medical evaluations.
- Other sections detail training, program evaluations, recordkeeping, and fit testing procedures.
- Appendixes A, B, and D provide information about respirator cleaning, seal check analysis, and voluntary use of respirators.
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Administrative Duties & Responsibilities

At Southwestern University, our Respiratory Protection Program Administrator is the Director of Campus Safety and Risk Management. All department heads, managers, supervisors, as well as employees wearing respirators are responsible to understand and implement the components of our written program.

- **Program Administrator**
  1. Overall development of program components.
  2. Provide consultative services to departments to help assess and evaluate workplace respiratory hazards.
  3. Provide consultative assistance in the proper selection and purchase of University standardized respiratory protection devices.
  4. Develop and provide training.
  5. Conduct individualized respirator fit testing services or administer 3rd party services.
  6. Administration of the medical evaluation and surveillance program with licensed physician.
  7. Recordkeeping.
  8. Program evaluation/audit and written program revisions.

- **Supervisors/Managers**
  1. Ensure the components of the respiratory protection program are understood and implemented within their areas of responsibility.
  2. Consult with RPP Administrator for purchase/selection of respiratory protective equipment – including type, brand, and model to ensure consistency with University standards.
  3. Ensure all employees in the RPP program (employees who are required to wear a respirator) attend RPP training, medical evaluation and fit testing on an annual basis (except for voluntary or non-mandatory use of disposable N95 type respirators).
  4. Provide all employees who wear disposable respirators a copy of Appendix D and 3m fitting instructions (maintain sign-in logs).
  5. Consult with RPP Administrator and schedule appointments with Concentra Medical Center for medical evaluations (complete OSHA questionnaire) and fit tests of selected employees.
  6. Ensure employees properly use, store, clean, and maintain respirators according to this program.
  7. Ensure employees who use respirators are clean shaven to ensure a proper fit and level of protection is achieved during each use.
  8. Inform RPP Administrator of any potential respiratory hazards that may not have been addressed or documented.

- **Employees**
  1. Employees are responsible to follow all the components of the RPP.
  2. Ensure the proper use, storage, cleaning, and maintenance of their respiratory devices.
  3. Ensure they are clean shaven prior to using a respirator.
  4. Attend all training, medical evaluation appointments and fit testing sessions.
  5. Inform their Supervisor and RPP Administrator of any potential respiratory hazards or adverse health effects that may not have been addressed or documented.
Respirator Selection

- The RPP Administrator will select proper respirators to be used based on hazards to which employees are or may be exposed, in accordance with OSHA standards. The RPP Administrator, along with Department Directors/Managers/Supervisors will review, document and/or conduct hazard evaluations for work tasks and/or processes to determine the need for respiratory protection.
- Respirators are selected on the basis of respiratory hazards (based on exposures using PEL’s or TLV’s) and other factors that affect respirator performance and reliability.
- The hazard evaluation will consist of identifying respiratory hazards, tasks/processes involved, typical duration and frequency of exposure for tasks, temperature/humidity levels, other PPE, level of exertion required, respirator type, and model and cartridge selection.

Respirator Types and Uses - See Appendix 1.

- Only NIOSH-certified respirators consistent with University standards are to be purchased, selected, and used. Currently, North 7000 Series Half-Face piece APR’s and MSA Advantage 1000 Full-Face piece APR’s are the designated University standards. 3M is the standard for disposable N95 – N100 respirators (dust masks). Refer to Appendix I – respirator selection chart.
Medical Evaluations* - Appointments at Concentra Medical

Employees who are **required to wear** (by OSHA standards or employer) any tight-fitting APR respirator [includes filtering facepiece N95 type respirators] or voluntary use of an elastomeric APR respirator must complete a *medical evaluation prior* to being permitted to wear a respirator or conducting a fit test session. **Voluntary use of a disposable respirator (N95 disposable filtering facepiece dust mask) does not require medical evaluation** per OSHA. A medical evaluation to determine whether an employee is able to use a particular type of respirator is necessary to prevent illnesses or impairments from the physiological burden imposed by respirator use. Initial medical evaluation is required and the frequency of subsequent annual medical evaluations will be determined by Southwestern University’s selected Physician.

- Southwestern University’s Physician or Other Licensed Health Care Provider (PLHCP) is Concentra Medical Center, 117B Louis Henna Blvd., Suite 200, Round Rock, Texas 78664. (512) 658-9370. Concentra’s PLHCP will provide medical evaluations (for employees **required** to wear tight fitting respirators). The employee must bring all respirator(s) they may be required to use and their completed medical questionnaire to Concentra. A medical examination as well as diagnostic tests may then be required based on the physician’s review of the questionnaire and discussion with employee. Each employee’s supervisor will be responsible to schedule appointments with Concentra in advance and follow-up with each employee to ensure they are prepared with necessary forms, respirators and are aware of their appointment. This medical evaluation/fit test will be conducted during work hours (paid time).

- Concentra will provide a written recommendation report (medical approval or denial) regarding an employee’s ability to use a respirator directly to the Respiratory Protection Program Administrator and the employee.

The written recommendation contains only the following information:
- 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.
- A statement that the PLHCP has provided the employee with a copy of the PLHCP's written recommendation.

Upon initial clearance for medical evaluation - Additional medical examinations:

An additional medical evaluation or physical examination may be required if:
- An employee reports medical signs or symptoms that are related to the ability to use a respirator.
- A PLHCP, supervisor, or the respirator program administrator informs the employer that an employee needs to be reevaluated.
- Information from the respiratory protection program, including observations made
during fit testing and program evaluation, indicates a need for employee reevaluation.

- A change occurs in workplace conditions (e.g., significant changes in physical work effort, protective clothing, and temperature) that may result in a substantial increase in the physiological burden placed on an employee.

Employees will have the opportunity to speak with the PLHCP (Concentra Physician) regarding their medical evaluation and any diagnostic exam results if they so request. Requests shall be forwarded to the RPP Administrator (Director of Campus Safety & Risk Management). The RPP Administrator will then communicate to the employees Supervisor and the Supervisor will arrange for a follow-up appointment.

The RPP Administrator will provide Concentra Medical Center with a copy of Southwestern University’s RPP, a copy of OSHA 1910.134 RPP standard, and all the requirements of paragraph (e) (5) of the standard. This includes the information in Appendix 1 – respirator task and selection chart.

**Training**

The RPP Administrator will provide formal RPP training on an annual basis to respirator users who are required by OSHA standards or employer to wear tight fitting respirators. This requirement does not apply to disposable filtering facepiece respirators even if required to be worn – OSHA exemption. Supervisors are also required to attend RPP training. Training will include the following areas:

- Why the respirator is necessary and how improper fit, use, or maintenance can compromise the protective effect of the respirator.
- The capabilities and the limitations of the respirator.
- Use of the respirator in emergency situations.
- How to inspect, put on, remove, and use the respirator and how to check the seals.
- Procedures for maintaining and storing a respirator.
- Recognition of the medical signs and the symptoms that may limit or prevent an employee’s effective use of a respirator.
- General requirements of the OSHA respirator standard and the content of Southwestern University’s RPP.

Employees who only wear disposable filtering facepiece respirators (dust masks) required or voluntary are only required to be provided Appendix D by their supervisor. However, Southwestern University will offer and provide additional training specific to disposable respirators to all affected employees interested. Supervisors are responsible to provide OSHA Appendix D as well as manufacturers fitting and use instructions – 3M brochure (p 21-25) to all employees affected.
Program Evaluation

It is inherent in respirator use that problems with protection, irritation, breathing resistance, comfort, and other respirator-related factors occasionally arise in most respirator protection programs. The RPP Administrator will conduct periodic evaluations (audits) to help ensure the components of Southwestern University’s RPP are being properly implemented.

Program evaluation involves the following:

- Conducting evaluations (audits) of the workplace as necessary to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective.
- Talking to supervisors and the employees required to use respirators (usually during training sessions) to ask for feedback and issues that may need attention. This is a good opportunity to identify problems and correct as necessary.
- Factors to assess include, but are not limited to:
  - Respirator fit
  - Appropriate respirator selection for the hazards to which the employee is exposed
  - Proper respirator use by employee
  - Proper respirator maintenance by employee
  - Proper supervision and oversight by employee’s supervisor

Recordkeeping

The RPP Administrator shall keep the following records:

- Employee medical evaluation reports from PLHCP
- Employee fit testing records
- Current updated copy of Southwestern University’s RPP

Supervisors shall provide a copy of Appendix D and 3M fitting instructions (p21-25) and maintain a signed copy of training log p22.

Fit Testing and Procedures

Fit testing helps to protect the employee against breathing contaminated ambient air due to an inadequate respirator face piece seal.

Fit testing is required for employees who are required by OSHA standards or employer (mandatory use) to use a negative-pressure [this includes required use of disposable filtering facepiece respirators (N95 dust masks)] or a positive-pressure, tight-fitting face piece respirator with a qualitative fit test (QLFT) or a quantitative fit test (QNFT) on an annual basis based on
the exposure evaluation and fit factor required (QLFT fit test can be used for exposures that are less than 10 times the PEL or < 100 Fit Factor). Employees who only wear respirators on a voluntary basis are not required to be fit tested but their supervisor will provide them with OSHA Appendix D as well as fitting and seal check instructions. Supervisor to maintain on file a copy of employee sign-in log p22.

- A qualitative fit test is a pass/fail test that is used to assess the adequacy of a respirator’s fit by relying on a person’s response to a test agent. A quantitative fit test assesses the adequacy of a respirator’s fit by numerically measuring the amount of leakage into the respirator.

The primary purpose of fit testing is to identify the specific make, model, style, and size of the respirator that is best suited for each employee. In addition, fit testing both provides an opportunity to check for problems with respirator use and reinforces respirator training by giving employees an opportunity to review the proper methods for putting on, checking for defects, and wearing the respirator.

Employees who are required to wear a negative or positive pressure respirator must pass the fit test and shall be fit tested at the following times with the same make, model, style, and size of respirator that will be used:

- Before the initial use of a respirator
- Whenever an employee uses a different respirator face piece type or style
- Annually
- An additional fit test is required whenever the employee reports changes or whenever the employer or PLHCP observes 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).

Southwestern’s RPP Administrator or Concentra Medical Center will typically conduct fit tests following the OSHA approved Bitrex Solution Aerosol QLFT Protocol in Appendix B of the RPP standard.

Our workplace-specific fit testing procedures include the following:

- Qualitative (QLFT) – using either Bitrex solution in a tent/enclosure or if Bitrex is not detected in sensitivity test, irritant smoke may be used with no tent/enclosure.
- Qualitative fit tests may be used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less.

**Proper Use Procedures**

Once the respirator has been properly selected and fitted, its protection efficiency must be maintained by proper use. Our proper respirator use procedures are required to be followed by all respirator users:

- User performs a seal check and inspects respirator parts each time a respirator is worn.
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• User does not wear a tight fitting respirator when facial hair is present in the seal area or any other condition interferes with the face to face piece seal.

Continuing Respirator Effectiveness
• If the employee detects vapor or gas breakthrough (odor), changes in breathing resistance, or leakage of the face piece, the following should be performed immediately:
  1. Replace chemical cartridges or filters
  2. Repair the respirator
  3. Notify supervisor and RPP Administrator to discuss options
• See Appendix B-1 (CFR1910.134) - Follow Seal Check Procedures

Maintenance and Care Procedures

Cleaning & disinfecting
• Employees must ensure that respirators are cleaned and disinfected using the procedures in Appendix B-2.
• The respirators are to be cleaned and disinfected at the following intervals:
  1. Issued for the exclusive use of an employee: As often as necessary to be maintained in a sanitary condition.
  2. Issued to more than one employee: Before being worn each time by different individuals.
  3. Maintained for emergency use: After each use.
  4. Used in fit testing and training: After each use.

Storage
• Storage of respirators must be done properly to ensure that the equipment is protected and not subject to environmental conditions that may cause deterioration.
• The employee must ensure that respirators are stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they are packed or stored to prevent deformation of the face piece and exhalation valve.

Inspection
• In order to assure the continued reliability of respirator equipment, the employee must
inspect it on a regular basis. The frequency of inspection is related to the frequency of use.

- **Routine use respirators:**
  1. Before each use and during cleaning

- **Emergency use respirators:**
  1. At least monthly and in accordance with the manufacturer's recommendations, and checked for proper function before and after each use.

- **Emergency escape-only respirators**
  1. Before being carried into the workplace for use

**Any one of our respirator inspections includes a check:**

- For respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the face piece, head straps, valves, connecting tube, and cartridges, canisters or filters.

- Of elastomeric parts for pliability and signs of deterioration.

**Repairs**

- Respirators that fail an inspection or are otherwise found to be defective are to be removed from service and either discarded or repaired in accordance with the following procedures:
  1. Only with the respirator manufacturer's NIOSH-approved parts designed for the respirator.
  2. Repairs must be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed.

**Voluntary Use of Respirators**

- **Appendix D:** Information for employees using respirators when not required under the OSHA standard (exposures do not exceed PEL’s). See p 21-25. **Supervisors** are responsible to provide Appendix D as well as 3M user fitting instructions and seal check instructions to all employees who voluntarily use respirators – especially for disposable respirators (dust masks). Supervisor responsible to maintain signed log p22. Voluntary use of ½ face silicone respirator should attend more formal respirator training.

- Voluntary use of a respirator does not require fit testing per OSHA but is recommended by manufacturers for tight fitting APR respirators (1/2 or full-face silicone).

- Mandatory use of respirators (including disposable respirators) that are required by OSHA standard or by employer requires following our written respiratory protection program, including fit testing and medical evaluation.
## Appendices

### Appendix 1 – Respirator task and selection chart

<table>
<thead>
<tr>
<th>Title</th>
<th>Task</th>
<th>Hazard(s)</th>
<th>Respirator/Cartridge</th>
<th>Required or Recommended (voluntary use)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Acid based cleaners, strippers, etc.</td>
<td>Acid gas</td>
<td>N95 - 3M #8516 (acid gas)</td>
<td>Voluntary Use</td>
</tr>
<tr>
<td>All</td>
<td>Cleaning and disinfecting surfaces</td>
<td>Cleaning products, (Sparquat, Spring Green)</td>
<td>If spray applied in large scale can use N95 - 3M #8214 (OV)</td>
<td>Voluntary Use</td>
</tr>
<tr>
<td>Housekeeping, Maintenance, HVAC.</td>
<td>Mold Remediation</td>
<td>Mold Spores</td>
<td>N95 - 3M #8210*, 3M #8110S - small face, 3M #8210V - for hot humid work - has exhalation valve.</td>
<td>Required</td>
</tr>
<tr>
<td>Grounds</td>
<td>Mowing and weed eating.</td>
<td>Grass, dust, pollens, plant particles</td>
<td>N95 - 3M #8210*</td>
<td>Voluntary Use - especially if allergic</td>
</tr>
<tr>
<td>HVAC, Maintenance</td>
<td>Cleaning Ductwork or exposure to insulation</td>
<td>Particulate dust, fiberglass, mineral wool particles</td>
<td>N95 - 3M #8210*</td>
<td>Voluntary Use</td>
</tr>
<tr>
<td>All</td>
<td>Sweep/clean wood dust, general dust,</td>
<td>Dust, wood dust, various particulates</td>
<td>N95 - 3M #8210*</td>
<td>Voluntary Use</td>
</tr>
<tr>
<td>All</td>
<td>Spray painting</td>
<td>Solvents – organic vapors</td>
<td>N95 – 3M #8214 (carbon filter - OV)</td>
<td>Voluntary Use Ensure good ventilation.</td>
</tr>
<tr>
<td>Maintenance, Plumber, Central Plant, Small Engine Mechanic</td>
<td>Welding/Metal Cutting</td>
<td>Welding fumes</td>
<td>N95 – 3M #8214 (carbon filter - OV)</td>
<td>Required.</td>
</tr>
<tr>
<td>-----------------------------------------------------------</td>
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<td>---------------</td>
<td>------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>All</td>
<td>Soldering</td>
<td>Solder fumes</td>
<td>N95 – 3M #8214 (carbon filter - OV)</td>
<td>Voluntary Use Ensure good ventilation.</td>
</tr>
<tr>
<td>HVAC, Maintenance</td>
<td>Contact adhesives, PVC glues, etc.</td>
<td>Vapor from glue solvents</td>
<td>N95 – 3M #8214 (carbon filter - OV)</td>
<td>Voluntary Use Ensure good ventilation.</td>
</tr>
<tr>
<td>Painter</td>
<td>Oil based painting, cleaning brushes, etc.</td>
<td>Solvents: Organic Vapors</td>
<td>North 7700/OV 1/2 face elastomeric OR for short duration, low level, use 3M #8214 (carbon filter)</td>
<td>Required. Ensure good ventilation. For short duration brush cleaning – recommended.</td>
</tr>
<tr>
<td>Painter</td>
<td>Refinish furniture</td>
<td>Paint stripper</td>
<td>Recommend 3M SafestStripper product - Walmart</td>
<td>Refer to SDS. Ensure good ventilation.</td>
</tr>
<tr>
<td>All</td>
<td>Coil cleaning</td>
<td>Citris based</td>
<td>Review SDS</td>
<td>Review SDS</td>
</tr>
<tr>
<td>Housekeeping</td>
<td>Floor cleaning, wax strippers, etc.</td>
<td>See SDS</td>
<td>See SDS – may be applicable to use N95 – 3M #8214 (carbon filter - OV)</td>
<td>Voluntary Use - ensure good ventilation.</td>
</tr>
<tr>
<td>All</td>
<td>Degreasers, cleaners.</td>
<td>See SDS</td>
<td>See SDS – may be applicable to use N95 – 3M #8214 (carbon filter - OV)</td>
<td>Voluntary Use - ensure good ventilation.</td>
</tr>
<tr>
<td>Grounds</td>
<td>Apply fertilizers</td>
<td>Fertilizer chemicals</td>
<td>Follow product label, instructions and SDS</td>
<td>Voluntary Use</td>
</tr>
</tbody>
</table>

*3M #8210V is equivalent to 3M#8210 but adds an exhalation valve for longer term use.*
Appendix A: Fit Testing Procedures (Mandatory)
Part I: OSHA Accepted Fit Test Protocols

Fit Testing Procedures -- General Requirements:

- The employer shall conduct fit testing using the following procedures. The requirements in
  this appendix apply to all OSHA-accepted fit test methods, both QLFT and QNFT.

1. The test subject shall be allowed to pick the most acceptable respirator from a
   sufficient number of respirator models and sizes so that the respirator is acceptable to,
   and correctly fits, the user.

2. Prior to the selection process, the test subject shall be shown how to put on a
   respirator, how it should be positioned on the face, how to set strap tension and how
   to determine an acceptable fit. A mirror shall be available to assist the subject in
   evaluating the fit and positioning of the respirator. This instruction may not constitute
   the subject's formal training on respirator use, because it is only a review.

3. The test subject shall be informed that he/she is being asked to select the respirator
   that provides the most acceptable fit. Each respirator represents a different size and
   shape, and if fitted and used properly, will provide adequate protection.

4. The test subject shall be instructed to hold each chosen face piece up to the face and
   eliminate those that obviously do not give an acceptable fit.

5. The more acceptable face pieces are noted in case the one selected proves
   unacceptable; the most comfortable mask is donned and worn at least five minutes to
   assess comfort. Assistance in assessing comfort can be given by discussing the points
   in the following item A.6. If the test subject is not familiar with using a particular
   respirator, the test subject shall be directed to don the mask several times and to
   adjust the straps each time to become adept at setting proper tension on the straps.

6. Assessment of comfort shall include a review of the following points with the test
   subject and allowing the test subject adequate time to determine the comfort of the
   respirator:
   a. Position of the mask on the nose
   b. Room for eye protection
   c. Room to talk
   d. Position of mask on face and cheeks

7. The following criteria shall be used to help determine the adequacy of the respirator
   fit:
   a. Chin properly placed
   b. Adequate strap tension, not overly tightened
   c. Fit across nose bridge
   d. Respirator of proper size to span distance from nose to chin
   e. Tendency of respirator to slip
   f. Self-observation in mirror to evaluate fit and respirator position.

8. The test subject shall conduct a user seal check, either the negative and positive
   pressure seal checks described in Appendix B-1 of this section, or those
   recommended by the respirator manufacturer which provide equivalent protection to
   the procedures in Appendix B-1. Before conducting the negative and positive
pressure checks, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another face piece shall be selected and retested if the test subject fails the user seal check tests.

9. The test shall not be conducted if there is any hair growth between the skin and the face piece sealing surface, such as stubble beard growth, beard, mustache, or sideburns which cross the respirator sealing surface. Any type of apparel that interferes with a satisfactory fit shall be altered or removed.

10. If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician or other licensed health care professional, as appropriate, to determine whether the test subject can wear a respirator while performing her or his duties.

11. If the employee finds the fit of the respirator unacceptable, the test subject shall be given the opportunity to select a different respirator and to be retested.

12. Exercise regimen: Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least 5 minutes before the start of the fit test.

13. The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use that could interfere with respirator fit.

- **I. A. 14. Fit Test Exercises**

The following test exercises are to be performed for all fit testing methods prescribed in this appendix, except for the CNP method. A separate fit testing exercise regimen is contained in the CNP protocol. The test subject shall perform exercises, in the test environment, in the following manner:

1. **Normal breathing:** In a normal standing position, without talking, the subject shall breathe normally.

2. **Deep breathing:** In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.

3. **Turning head side to side:** Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.

4. **Moving head up and down:** Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).
5. **Talking:** The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite a memorized poem or song.
   a. **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.

6. **QNFT ONLY:** Grimace. The test subject shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT)

7. **Bending over:** The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT or QLFT units that do not permit bending over at the waist.

8. **Normal breathing:** Same as exercise 1.
   a. Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for 15 seconds. The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become unacceptable, another model of respirator shall be tried. The respirator shall not be adjusted once the fit test exercises begin. Any adjustment voids the test, and the fit test must be repeated.

**Qualitative Fit Test (QLFT) Protocols**

1. **General**
   a. The employer shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and ensure that test equipment is in proper working order.
   b. The employer shall ensure that QLFT equipment is kept clean and well maintained so as to operate within the parameters for which it was designed.

**Fit Testing with Bitrex™**

The sensitivity test is done first to verify that the person being fit tested can detect the taste of the Bitrex solution at a diluted concentration. Following is a brief description of those procedures:

1. Have the person put on the test hood without a respirator.
2. Position the hood forward so that there is a six-inch gap between the person's face and the window.
3. Instruct the person to breathe through his/her mouth.
4. Using a nebulizer containing the sensitivity solution, inject the aerosol into the hood. Inject ten squeezes of the bulb, allowing the bulb to full collapse and expand on each squeeze.
5. Ask the person if he/she can taste the sensitivity solution.
6. If the person does not taste the sensitivity solution, inject an additional ten squeezes of the aerosol into the hood. Repeat again if needed. Do not exceed a total of thirty squeezes during the test. If thirty squeezes are inadequate, end the test and use a different fit test method.
7. Remove the hood and give the subject a few minutes to clear the taste from his/her mouth.

**Once the individual passes the sensitivity test, the actual fit test can be conducted.** These are the basic steps that need to be followed:

1. Have the person put on the test hood with a respirator.
2. Position the hood forward so that there is a six-inch gap between the person's face and the window.
3. Using the nebulizer filled with the test solution, inject the aerosol into the hood using the same number of squeezes required during the sensitivity test (see step 6 above).
4. Instruct the person to tell you if they can taste the Bitrex at any time during the test.
5. To maintain an adequate concentration of the Bitrex aerosols during the test, inject one-half of the number of squeezes used in step 3 every thirty seconds.
6. After the initial aerosol is injected, instruct the person to perform the following exercises for 60 seconds each.
   a. Normal breathing
   b. Deep breathing
   c. Turning head from side to side
   d. Nodding the head up and down
   e. Talking, recite the alphabet or read a passage out loud (i.e. Rainbow Passage)
   f. Normal breathing
7. If the entire test is completed without the person detecting the bitter taste of the Bitrex aerosol, the test is successful.
8. If the person does detect the taste of Bitrex, terminate the test. Wait fifteen minutes and perform the test again starting with the sensitivity test.

The person administering the qualitative fit test does not have to be certified by an organization or OSHA in order to conduct fit testing. However, he/she should be qualified by the employer so he/she is able to administer the test, prepare the solutions, calibrate equipment, and perform the test properly. The employer needs to certify at the conclusion of the test that the employee has successfully completed the fit test. The following items need to be on the certification form: name of employee, type of respirator (model and size), date of test, and signature of the tester and test subject.
Conclusion

Bitrex is a safer and more reliable fit testing agent than saccharin and irritant smoke. A fit test subject may easily avoid acknowledging a poor fit because saccharin has a sweet taste or he/she may not be able to taste it. Irritant smoke will cause the fit test subject to cough, making it a poor fit evident, but the hydrochloric acid mist from the stannic chloride can also be irritating to mucous membranes. On the other hand, because of the bitter taste it leaves in the mouth, Bitrex usually causes a response in the test subject, yet it is not toxic. It is also an acceptable method for fit testing the new N, R, and P filters which meet 42 CFR Part 84 criteria for particulate filtration.


Irritant Smoke (Stannic Chloride) Protocol - not recommended for use on individuals with significant asthma, COPD, etc.

This qualitative fit test uses a person's response to the irritating chemicals released in the "smoke" produced by a stannic chloride ventilation smoke tube to detect leakage into the respirator.

General Requirements and Precautions

1. The respirator to be tested shall be equipped with high efficiency particulate air (HEPA) or P100 series filter(s).
2. Only stannic chloride smoke tubes shall be used for this protocol.
3. No form of test enclosure or hood for the test subject shall be used.
4. The smoke can be irritating to the eyes, lungs, and nasal passages. The test conductor shall take precautions to minimize the test subject's exposure to irritant smoke. Sensitivity varies, and certain individuals may respond to a greater degree to irritant smoke. Care shall be taken when performing the sensitivity screening checks that determine whether the test subject can detect irritant smoke to use only the minimum amount of smoke necessary to elicit a response from the test subject.
5. The fit test shall be performed in an area with adequate ventilation to prevent exposure of the person conducting the fit test or the build-up of irritant smoke in the general atmosphere.

Sensitivity Screening Check

The person to be tested must demonstrate his or her ability to detect a weak concentration of the irritant smoke.
1. The test operator shall break both ends of a ventilation smoke tube containing stannic chloride, and attach one end of the smoke tube to a low flow air pump set to deliver 200 milliliters per minute, or an aspirator squeeze bulb. The test operator shall cover the other end of the smoke tube with a short piece of tubing to prevent potential injury from the jagged end of the smoke tube.

2. The test operator shall advise the test subject that the smoke can be irritating to the eyes, lungs, and nasal passages and instruct the subject to keep his/her eyes closed while the test is performed.

3. The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its irritating properties and to determine if he/she can detect the irritating properties of the smoke. The test operator shall carefully direct a small amount of the irritant smoke in the test subject’s direction to determine that he/she can detect it.

- **Irritant Smoke Fit Test Procedure (no tent enclosure)**

1. The person being fit tested shall don the respirator without assistance, and perform the required user seal check(s).

2. The test subject shall be instructed to keep his/her eyes closed.

3. The test operator shall direct the stream of irritant smoke from the smoke tube toward the face seal area of the test subject, using the low flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the face piece and move the smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator.

4. If the person being tested has not had an involuntary response and/or detected the irritant smoke, proceed with the test exercises.

5. The exercises identified in section I.A. 14. of this appendix shall be performed by the test subject while the respirator seal is being continually challenged by the smoke, directed around the perimeter of the respirator at a distance of six inches. (Refer to Section I. A. 14. – Conduct Fit Test Exercises).

6. If the person being fit tested reports detecting the irritant smoke at any time, the test has failed. The person being re-tested must repeat the entire sensitivity check and fit test procedure.

7. Each test subject passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check, with the smoke from the same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.

8. If a response is produced during this second sensitivity check, then the fit test is passed.
Appendix B-1 to § 1910.134: User Seal Check Procedures (Mandatory)
The 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 the positive and negative pressure checks listed in this appendix, or the respirator manufacturers recommended user seal check method shall be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

- **Face piece Positive and/or Negative Pressure Checks**
  1. *Positive pressure check:* Close off the exhalation valve 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 outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.
  2. *Negative pressure check.* Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the face piece collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the face piece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

- **Manufacturer's Recommended User Seal Check Procedures:** The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that the employer demonstrates that the manufacturer's procedures are equally effective. [63 FR 1152, Jan. 8, 1998].

Appendix B-2 § 1910.134: Respirator Cleaning Procedures (Mandatory)
These procedures are provided for employer use when cleaning respirators. They are general in nature, and the employer as an alternative may use the cleaning recommendations provided by the manufacturer of the respirators used by their employees, provided such procedures are as effective as those listed here in Appendix B-2. Equivalent effectiveness simply means that the procedures used must accomplish the objectives set forth in Appendix B-2, i.e., must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user.

- **Procedures for Cleaning Respirators**
  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 deg. C [110 deg. F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.


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 (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 43 deg. C (110 deg. F).
   b. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43 deg. C (110 deg. F).
   c. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.

5. Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), 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.

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

7. Reassemble face piece, replacing filters, cartridges, and canisters where necessary.

8. Test the respirator to ensure that all components work properly. [63 FR 1152, Jan. 8, 1998]
Appendix D § 1910.134: Respiratory Protection Standard (Non-Mandatory)

Information for Employees When Respirator is Not Required Under the OSHA 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 exposure limits set by OSHA standards. 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. Read and review the CDC or 3M disposable respirator fitting instructions provided by your supervisor.
  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. Ensure you have a clean shaven face prior to wearing a respirator.
  5. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

I have received and read Appendix D and have been provided either CDC or 3M disposable respirator fitting instructions in writing for the voluntary use of a disposable filtering respirator:

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Wearing your filtering facepiece respirator

1. Place the respirator over your nose and mouth. Be sure the metal nose clip is on top. With model 8210, pre-stretch the straps before wearing.

2. Pull the top strap over your head until it rests on the crown of your head above your ears.

3. Pull the bottom strap over your head until it rests just below your ears.

4. Using both hands starting at the top, mold the metal nose clip around your nose to achieve a secure seal. Notes: Pinching the nosepiece using one hand may result in improper fit and less effective respirator performance. Use two hands.

Check the seal of your filtering facepiece respirator each time you don the respirator.

1a. For non-valved respirators Place both hands completely over the respirator and exhale. The respirator should bulge slightly. If air leaks between the face and face seal of the respirator, reposition it and readjust the nose clip for a more secure seal. If you cannot achieve a proper seal, do not enter the contaminated area. See your supervisor.

1b. For valved respirators Place both hands over the respirator and inhale sharply. The respirator should collapse slightly. If air leaks between the face and face seal of the respirator, reposition it and readjust the nose clip for a more secure seal. If you cannot achieve a proper seal, do not enter the contaminated area. See your supervisor.
3M™ Fitting Instructions for
3M™ Filtering Facepiece Respirators

WARNING

These respirators help reduce exposure to certain particles. Misuse may result in sickness or death. Before use, the wearer must read and understand User Instructions provided as a part of product packaging. Time use limitations may apply. For proper use, see package instructions, supervisor or call 3M OH&ESD Technical Service in U.S.A., 1-800-243-4650. In Canada, call 1-800-597-4414.

Important
Before using these respirators, you must determine the following:
1. The type of contaminant(s) for which the respirator is being selected.
2. The concentration level of contaminant(s).
3. Whether the respirator can be properly fitted on the wearer’s face. Do not use with beards, on other facial hair, or other conditions that prevent a good seal between the face and the facesal of the respirator.
4. Before use of these respirators, a written respiratory protection program must be implemented, meeting all the requirements of OSHA 29 CFR 1910.134, including training, medical evaluation and fit testing.

For more information, please contact:

3M Occupational Health and Environmental Safety Division (OH&ESD)
In the U.S., contact:
Sales Assistance
1-800-899-4223
Technical Assistance
1-800-243-4650
Fax On Demand
1-800-546-1655
Internet
http://www.3M.com/ohcupsafety
For other 3M products
1-800-3M HELPS

In Canada, contact:
3M Canada Company, OH&ESD
P.O. Box 5757
London, Ontario N6A 4T1
Sales Assistance
1-866-295-1640, ext. 6137
Technical Assistance (Canada only)
1-866-267-4414
Fax On Demand
1-800-546-1655
Internet
http://www.3M.com/CA/ohcupsafety

Technical Assistance in Mexico
01-800-712-0646
5270-2255, 5270-2119 (Mexico City only)
Technical Assistance in Brazil
0800-12233
Fax On Demand O.U.S. Locations
1-651-732-9530

3M
General Offices
3M Center
St. Paul, MN 55144-1000
Cómo usar su respirador de pieza facial filtrante con bandas ajustables y válvula de exhalaración.

1. Coloque el respirador cubriendo su boca y nariz. Asegúrese que el clip metálico quede arriba.

2. Lleve la banda inferior por arriba de su cabeza hasta colocarla debajo de sus orejas, en la parte trasera de su cuello.

3. Lleve la banda superior por arriba de su cabeza, hasta apoyarla en la corona de la cabeza, por encima de sus orejas.

4. Sin quitar el respirador, ajuste las bandas hasta que lo sienta seguro. Para ajustar el respirador tire suavemente de los extremos de las bandas. Para asegurar el respirador, presione en la parte de atrás de la hebilla.

5. Utilizando los dedos índice y medio de las dos manos, empuñando por la parte superior, empuje el clip metálico alrededor de la nariz para asegurar un ajuste seguro.

Pruebe el ajuste de su respirador de pieza facial filtrante con bandas ajustables y válvula de exhalaración cada vez que se lo coloque.

Coloque ambas manos sobre el respirador e inhale con fuerza. El respirador deberá hincharse ligeramente. Si el alerón contra los bordes del respirador, colóquelo nuevamente y ajuste el clip metálico hasta lograr un ajuste seguro. Si no logra un ajuste correcto no ingrese en el área contaminada. Vea a su supervisor.

**ADVERTENCIA:**

- Use el respirador adecuado para el trabajo que realice y para el ambiente en el que lo use.
- Este respirador no está diseñado para proteger contra gases o vapores altamente tóxicos o sustancias químicas altamente reactivas.
- No use este respirador si está afectado por el humo o la columna de humo.
- No use este respirador si está afectado por el humo o la columna de humo.
- Al usar este respirador, asegúrese de que esté colocado correctamente y que esté ajustado para que no se escape el aire.

*3M Innovación*
Respiratory Fit Test Record

1. Employee given description of fit test requirements/protocol prior to start  
   Yes  No

2. Positive response to sensitivity screening check:  
   Yes  No

3. Demonstrates donning respirator (HEPA filters) w/o assistance.  
   Yes  No

4. Passed respirator positive/negative seal check  
   Yes  No

5. Perform fit test protocol  
   PASS – continue  
   FAIL – restart from item 2. (re-adjust respirator)

A. Employee Name (Print): ____________________________________

B. Type of Fit Test Performed: Qualitative: Bitrex Aerosol / Irritant Smoke
   1. OSHA “Fit Test Exercises”  (p15)
   2. Bitrex Protocol  (p17)
   3. Irritant Smoke Protocol  (p20)

C. Respirator Make: MSA  Model: Advantage 1000  Style: Full-Face APR  Size:
   Small  Medium  Large

   Respirator Make: North  Model: 5500 / 7700  Style: Half-Facepiece APR
   Size: Small  Medium  Large

   OTHER Respirator Make:  Model:  Style:
   Size: Small  Medium  Large

D. Date of Fit Test: ____________________________

E. RESULTS:  PASS  FAIL

   Place photocopy of Fit Test Record in respirator bag for reference

Respiratory Protection Program Administrator: Michael DeLance: ________________
Safety & Risk Management Policies and Procedures
Respiratory Protection Policy and Procedure

Date:

Approved (signature and date):

Supervisor

Director of Physical Plant

AVP for Facilities

Vice President for Fiscal Affairs If needed

Copy:

All supervisors

Related crafts

Department Heads

VP’s

President