Respiratory protection program

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# Respiratory Protection Program

## Authority

Title 8, California Code of Regulations (CCR), [Section 5144](https://www.dir.ca.gov/title8/5144.html)

## Regulatory Agencies

California Department of Industrial Relations, Division of Occupational Safety and Health

## Background

OSHA, under the provisions of § 5144 and appendices, requires certain employers to develop and implement a written respiratory protection program with required worksite-specific procedures and elements for required respirator use.

In any workplace where respirators are necessary to protect the health of the employee or whenever respirators are required by the employer, OSHA requires the employer to establish and implement this required respiratory protection program.

In addition, certain program elements may be required for voluntary use of respirators. These elements are designed to manage potential hazards associated with the use of respirators. The program shall be updated as necessary to reflect those changes in workplace conditions that affect respirator use ([Mandatory] Information for Employees Using Respirators When Not Required Under Standard, 8 CCR 5144D).

## Respiratory Protection Administrator

The respiratory protection program, designed in compliance with 8 CCR § 5144, must be administered by a suitably trained program administrator who is qualified by appropriate training or experience commensurate with the complexity of the program to administer or oversee the respiratory protection program and conduct the required evaluations of program effectiveness. See accompanying form: Appointment of Respiratory Protection Program Administrator Form [Appendix A](#_Appendix_A:_Form:).

## Objectives

The following provisions, as applicable, shall be included by the employer in the written respiratory protection program:

* Procedures for selecting respirators for use in the workplace (included in Section 1).
* Medical evaluations of employees required to use respirators (included in Section 2).
* Fit-testing procedures for tight-fitting respirators (included in Section 3).
* Procedures for proper use of respirators in routine and reasonably foreseeable emergency situations (included in Section 4).
* Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators (included in Section 5).
* Procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators (included in Section 6).
* Training of employees in the respiratory hazards to which they are potentially exposed during routine and emergency situations (included in Section 7).
* Training of employees in the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance (included in Section 8).
* Procedures for regularly evaluating the effectiveness of the program (included in Section 9).

## Employee Use of Respirators Not Required by Employer

Where respirator use is not required, an employer may provide respirators at the request of employees or permit employees to use their own respirators if the employer determines that such respirator use will not in itself create a hazard.

If the employer determines that any voluntary respirator use is permissible, the employer shall provide the respirator users with the information contained in \* CCR §5144D.

The employer must establish and implement those elements of a written respiratory protection program necessary to ensure that any employee using a respirator voluntarily is:

* Medically able to use that respirator.
* The respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user.

Employers are not required, however, to include in a written respiratory protection program those employees whose only use of respirators involves the voluntary use of filtering face pieces (dust masks) however sign a “Voluntary Use of Filtering Face Piece” Form ([Appendix B](#_Appendix_B:_Form:)).

## Fees/Costs to Employer/Employees

8 CCR 5144, “When respirator use is required or indicated, the employer shall provide respirators, training, and medical evaluations at no cost to the employee.”

## Responsibilities

### University Administration

The campus President has ultimate responsibility for establishing and maintaining effective policies and procedure regarding environmental health and safety within the institution and should, with other administrators, provide continuing support for institutional use of personal protective equipment. Policies and Procedure which govern the activities and responsibilities of the Environmental Health and Safety (EH&S) program are thereby established under the final authority of the President.

### Individual Departments

The Department Heads and Supervisors of individual departments on campus should have intimate knowledge of the types of work and the types of work environments that may be encountered within their areas. Therefore, they have the following responsibilities:

1. Determining whether their employees may encounter potentially hazardous airborne contaminants;
2. Identifying employees that must wear respiratory protection;
3. Providing medical evaluation and monitoring, training, and protective equipment for employees exposed to potentially hazardous air contaminants;
4. Confirming through inspection and observation that employees are correctly utilizing and maintaining respiratory protection.
5. Providing annual program review and reporting suggestions or corrections to the EHS Department.

### Environmental Health and Safety Department (EHS)

The EH&S Department is responsible for providing support and consultation to departments that will include:

1. Providing statutes, authorities, and references;
2. Identifying and arranging training upon request;
3. Identifying and arranging medical exams and monitoring upon request;
4. Identifying resources and vendors for respiratory protection related equipment and services;
5. Notifying departments of changes or updates in respiratory protection regulations.
6. Administering the Respiratory Protection Program.
7. Annual Program Review
8. Training personnel in the selection and use of respiratory protective devices
9. Conducting qualitative and/or quantitative fit testing
10. Determining whether engineering or administrative controls are feasible
11. Determining the degree of hazard, including those that are immediately dangerous to life and health (IDLH), posed by the potential exposure.
12. Recordkeeping

### Employees

The following are employee responsibilities:

1. Appropriate use of respiratory protection as identified in the formal respiratory protection training sessions;
2. Notifying supervisors of changes in work conditions or environments that may require the use of respiratory protection where none was needed before;
3. Notify the supervisor of any physical change that may affect the employee’s ability to wear a respirator.
4. Use common sense and good judgment at all times; and minimize exposures to airborne contaminants.
5. Read and comply with procedures, while performing assigned duties.
6. Utilize respiratory protective equipment in accordance with instruction and training provided.
7. Inform supervisor of any personal health problems that could be aggravated by the use of respiratory protective equipment.
8. Report observed or suspected malfunctioning respirator immediately.
9. Use only the specific brand, model and size of respiratory protective equipment for which training and fit testing have been provided.
10. Conduct positive and negative pressure fit tests prior to each respirator use.
11. Ensure that the assigned respirator is inspected, cleaned, disinfected, repaired, and stored.
12. Attend all training and ensure attendance roster is signed.
13. Request additional training or assistance when uncomfortable or unclear with information provided relative to personal safety.

### Occupational Health Services (OHS)

OHS is responsible for establishing medical evaluation and surveillance procedures and reviewing the health status of all personnel who may be required to wear respiratory protective equipment in the completion of their assigned tasks.

### Contractors

Contractors are required to develop and implement a respiratory protection program for their employees who must enter into or work in areas where exposure to hazardous materials cannot be controlled or avoided. This program must meet Cal/OSHA regulations.

## Program Policies and Procedures

### Section 1: Procedures for Selecting Respirators for Use in the Workplace

The employer shall evaluate respiratory hazard(s) in the workplace, identify relevant workplace and user factors, and base respirator selection on these factors. The employer shall also specify appropriate protective respirators for Immediately Dangerous to Life or Health (IDLH) atmospheres.

The employer shall identify and evaluate the respiratory hazard(s) in the workplace; this evaluation shall include a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant’s chemical state and physical form. Where the employer cannot identify or reasonably estimate the employee exposure, the employer shall consider the atmosphere to be IDLH.

The employer shall select and provide an appropriate respirator based on the respiratory hazard(s) to which the worker is exposed and workplace and user factors that affect respirator performance and reliability.

The employer shall select a NIOSH-certified respirator. The respirator shall be used in compliance with the conditions of that certification. A list of NIOSH-certified respirators and the conditions of the certification can be obtained from NIOSH (http://www.cdc.gov/niosh/homepage.html). The employer shall select respirators from a sufficient number of respirator models and sizes so that the respirator is acceptable to and correctly fits the user.

The NIOSH Decision Logic for Respirator Selection (2004) has been incorporated as a useful tool in the employer’s assessment. Recommendations in the decision logic for respirator selection are based primarily on the physical, chemical, and toxicological properties of the contaminant, and on the limitations of each class of respirators, including filtration efficiency, air- supply capability, and face seal characteristics and leakage. See Assessment Tool: NIOSH Decision Logic for Respirator Selection which follows Assessment Tool: Respiratory Hazards in the Workplace, both included in this Section 1.

#### Respirators for IDLH Atmospheres

IDLH atmospheres are those atmospheres that pose an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual’s ability to escape from a dangerous atmosphere.

Oxygen-deficient atmospheres (less than 19.5% oxygen) shall be considered IDLH. Exception to this includes an employer’s ability to demonstrate that, under all foreseeable conditions, the oxygen concentration can be maintained within the ranges specified in Table II (altitude and oxygen concentration) of 8 CCR 5144 then, the atmosphere-supplying respirator may be used.

The employer shall provide either of the following respirators for employees in IDLH atmospheres § 8CCR 5144(d)

* A full-facepiece pressure-demand Self-Contained Breathing Apparatus (SCBA) certified by NIOSH for a minimum service life of 30 minutes.
* A combination full-facepiece pressure-demand Supplied-Air Respirator (SAR) with auxiliary self-contained air supply.

Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

#### Respirators for Atmospheres That Are Not IDLH

The employer shall provide a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations (8CCR 5144). The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.

#### Respirator Selection

For protection against gases and vapors, the employer shall provide either of the following:

* An atmosphere supplying respirator, or
* An Air-Purifying Respirator (APR).

Provided that the respirator is equipped with an End-of Service-Life Indicator (ESLI) certified by NIOSH for the contaminant or if there is no ESLI appropriate for conditions in the employer’s workplace, the employer implements a change schedule for canisters, cartridges, and/or filters that is based on objective information or data that will ensure that canisters, cartridges, and filters are changed before the end of their service life.

For protection against particulates, the employer shall provide one of the following:

* An atmosphere-supplying respirator.
* An APR equipped with a filter certified by NIOSH under 42 C.F.R. Part 84 as a High- Efficiency Particulate Air (HEPA) filter, or an APR equipped with a filter certified for particulates by NIOSH under 42 C.F.R. Part 84 (2012).
* For contaminants consisting primarily of particles with Mass Median Aerodynamic Diameters (MMAD) of at least two micrometers, an APR equipped with any filter certified by NIOSH.

Nonpowered air-purifying particulate respirators are classified into three series: N-, R-, and P- series and are classified according to the efficiency level of the filter(s) as tested according to the requirements of 42 C.F.R. § 84.170 (2012).

* The N-series filters are restricted to use in those workplaces free of oil aerosols.
* The R- and P-series filters are intended for removal of any particulate that includes oil- based liquid particulates.
* N100, R100, and P100 filters demonstrate a minimum efficiency level of 99.97%.
* N99, R99, and P99 filters demonstrate a minimum efficiency level of 99%.
* N95, R95, and P95 filters demonstrate a minimum efficiency level of 95%.

All filters, cartridges, canisters, and/or filters used in the workplace shall be labeled and color coded with the NIOSH approval label, and that label will not to be removed and must remain legible. American National Standards Institute (ANSI) Standard 13.1-67 describes the required color-coding scheme.

|  |  |
| --- | --- |
| Atmospheric contaminants to be protected against | Color assigned |
| Acid gases | White |
| Hydrocyanic acid gas | White with 1/2-inch green stripe completely around the canister near the bottom. |
| Chlorine gas | White with 1/2-inch yellow stripe completely around the canister near the bottom. |
| Organic vapors | Black |
| Ammonia gas | Green |
| Acid gases and ammonia gases | Green with 1/2-inch white stripe completely around the canister near the bottom. |
| Carbon Monoxide | Blue |
| Acid gases and organic vapors | Yellow |
| Hydrocyanic acid gas and chloropicrin vapor | Yellow with 1/2-inch blue stripe completely around the canister near the bottom. |
| Acid gases, organic vapors, and ammonia gases | Brown |
| Radioactive materials, excepting tritium and noble gases | Purple (Magenta) |
| Particulates (dusts, fumes, mists, fogs, or smokes) in combination with any of the above gases or vapors | Canister color for contaminant, as designated above, with 1/2-inch gray stripe completely around the canister near the top. |
| All of the above atmospheric contaminants | Red with 1/2-inch gray stripe completely around the canister near the top. |

Respirators with air-purifying sorbent elements shall be used with caution and with recognition of the wide variability of service lives under differing use conditions. Factors known to affect the service lives of sorbent elements include, but are not limited to

* The make and model of sorbent element(s).
* Airborne concentrations of contaminant(s).
* Relative humidity through each sorbent element.

Classes of respirators offering greater protection can usually be used in place of the minimum acceptable class of respirators. Respirator classes are consistent with respirator certification groupings as specified in 42 C.F.R. Part 84 (2012).

#### Assessment Tool: Respiratory Hazards in the Workplace

Hazards to which emergency service employees are likely to be exposed include irritants e.g., Riot Control Agents (RCA), Toxic Industrial Chemicals (TIC), contagious and infectious diseases, and Weapons of Mass Destruction (WMD). Due to the nature of emergency response work, the employee may approach a hazardous environment without his or her immediate knowledge. Where the employer cannot identify or reasonably estimate the employee exposure, the employer shall consider the atmosphere to be IDLH.

In addition, other factors include the following:

* Outside (open-air) environments.
* Changing wind condition(s) including direction, speed, temperature.
* Thermal environmental conditions (heat or cold).
* Humidity, dew point.
* Precipitation (rain, snow, ice).
* Confined-space environments; enclosed buildings may be included as confined spaces based on the hazards (known, unknown, or reasonably potential) presented.

Employee Position/Classification:

Month/Date/Year of Assessment:

#### Potential Respiratory Hazards

##### Biological Hazards

The Centers for Disease Control and Prevention (CDC; http://www.cdc.gov) classifies biological agents in the following ways:

Category A Diseases/Agents

The U.S. public health system and primary healthcare providers must be prepared to address various biological agents, including pathogens that are rarely seen in the United States. High-priority agents include organisms that pose a risk to national security, because they can be easily disseminated or transmitted from person to person, result in high mortality rates and have the potential for major public health impact, might cause public panic and social disruption; and require special action for public health preparedness.

Category B Diseases/Agents

Second-highest priority agents include those that are moderately easy to disseminate, result in moderate morbidity rates and low mortality rates, and require specific enhancements of CDC’s diagnostic capacity and enhanced disease surveillance.

Category C Diseases/Agents

Third-highest priority agents include emerging pathogens that could be engineered for mass dissemination in the future because of availability, ease of production and dissemination, and potential for high morbidity and mortality rates and major health impact.

Some biological agents are naturally respiratory hazards affecting humans. Other agents that may not normally be considered to be respiratory hazards to humans may be weaponized, genetically modified, or enhanced with other materials to make them respiratory hazards. For this purpose a comprehensive list of biological agents is listed below.

1. Potential biological agents include
   1. Anthrax (*Bacillus anthracis*)—Category A
   2. *Bacillus anthracis* (anthrax)—Category A
   3. Botulism (*Clostridium botulinum toxin*)—Category A
   4. Brucella species (brucellosis)—Category B
   5. Brucellosis (Brucella species)—Category B
   6. *Burkholderia mallei* (glanders)—Category B
   7. *Burkholderia pseudomallei* (melioidosis)
   8. *Chlamydia psittaci* (psittacosis) Cholera (*Vibrio cholerae*)
   9. *Clostridium botulinum* toxin (botulism)—Category B
   10. *Clostridium perfringens* (Epsilon toxin)
   11. *Coxiella burnetii* (Q fever)—Category B
   12. *E. coli O157: H7* (*Escherichia coli*)—Category B
   13. Emerging infectious diseases—Category C such as Nipah virus and hantavirus Epsilon toxin of *Clostridium perfringens*
   14. Escherichia coli O157:H7 (E. coli)—Category B
   15. Food safety threats
       1. (e.g., Salmonella species, *Escherichia coli O157:H7, Shigella*)
   16. *Francisella tularensis* (tularemia)—Category A
   17. Glanders (*Burkholderia mallei*)—Category B
   18. Melioidosis (*Burkholderia pseudomallei*)
   19. Plague (*Yersinia pestis*)—Category A
   20. Psittacosis (*Chlamydia psittaci*)
   21. Q fever (*Coxiella burnetii*)—Category B
   22. Ricin toxin from *Ricinus communis*—Category B (castor beans)
   23. *Rickettsia prowazekii* (typhus fever)—Category B
   24. Salmonella species (salmonellosis)
   25. *Salmonella typhi* (typhoid fever)
   26. Salmonellosis (Salmonella species)
   27. Shigella (shigellosis)—Category B
   28. Shigellosis (Shigella)—Category B
   29. Smallpox (*Variola major*)—Category A Staphylococcal enterotoxin B—Category B
   30. Tularemia (*Francisella tularensis*)—Category A
   31. Typhoid fever (*Salmonella typhi*)—Category B
   32. Typhus fever (*Rickettsia prowazekii*)—Category B
   33. *Variola major* (smallpox)—Category A
   34. *Vibrio cholerae* (cholera)
   35. Viral encephalitis (alphaviruses—Category A [e.g., Venezuelan Equine Encephalitis, eastern equine encephalitis, western equine encephalitis])
   36. Viral Hemorrhagic Fevers—Category A
   37. (filoviruses [e.g., Ebola, Marburg] and arenaviruses [e.g., Lassa, Machupo])
   38. Water safety threats (e.g., *Vibrio cholerae, Cryptosporidium parvum*)
   39. *Yersinia pestis* (plague)—Category A

##### Chemical Hazards

* Abrin
* Adamsite (DM)
* Agent 15
* Ammonia Arsenic
* Arsine (SA)
* Benzene
* Bromobenzylcyanide (CA)
* BZ
* Cannabinoids
* Chlorine (CL)
* Chloracetophenone (CN)
* Choropicrin (PS)
* CNB (CN in Benzene and Carbon Tetrachloride)
* CNC (CN in Chloroform)
* CNS (CN in Chloropicrin in Chloroform)
* CR
* CS
* Cyanide
* Cyanogen Chloride (CK)
* Cyclohexyl Sarin (GF)
* Diphenylchloroarsine (DA)
* Diphenylcyanoarsine (DC)
* Diphosgene (DP)
* Distilled Mustard (HD)
* Ethyldichlorarsine (ED)
* Ethylene Glycol
* Fentanyls and Other Opioids
* Hydrofluoric Acid
* Hydrogen Chloride
* Hydrogen Cyanide (AC)
* Lewisite (L, L-1, L-2, L-3) LSD
* Mercury
* Methyldichloroarsine (MD)
* Mustard (H) (Sulfur Mustard)
* Mustard/Lewisite (HL)
* Mustard/T
* Nitrogen Mustard (HN-1, HN-2, HN-3)
* Nitrogen Oxide (NO)
* Paraquat
* Perflurorisobutylene (PHIB)
* Phenodichlorarsine (PD)
* Phenothiazines
* Phosgene (CG)
* Phosgene Oxime (CX)
* Sodium Cyanide (NaCN)
* Soman (GD)
* Sulfur Mustard (H)
* Super Warfarin
* Sulfur Trixide-Chlorosulfonic Acid (FS)
* Phosphine
* Potassium Cyanide (KCN)
* Red Phosphorous (RP)
* Ricin
* Sarin (GB)
* Sesqui Mustard
* Sodium Azide
* Tabun (GA)
* Teflon and Perfluorisobutylene (PHIB)
* Titanium Tetrachloride (FM)
* Unidentified Chemical
* VX (Methylphosphonothioic Acid)
* White Phosphorus
* Zinc Oxide (HC)

##### Radiological Hazards

* Alpha particles
* Beta particles
* Gamma rays
* X-rays

##### Other Respiratory Hazards (List)

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Overall Estimate of Exposures for This Employee Position/Classification to Respiratory Hazards (check one):

* High
* Moderate
* Low
* None

#### Assessment Tool: NIOSH Decision Logic for Respirator Selection

This section comes directly from the *NIOSH Decision Logic for Respirator Selection* (2004, pp. 2 and 5-10).

To use this selection logic, the user must first assemble the necessary toxicologic, safety, and other relevant information for each respiratory hazard, including the following:

* General use conditions, including determination of contaminant(s);
* Physical, chemical, and toxicological properties of the contaminant(s);
* NIOSH recommended exposure limit (REL), OSHA permissible exposure limit

(PEL), American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV), State-OSHA exposure limit, American Industrial Hygiene Association (AIHA) Workplace Environmental Exposure Limit (WEEL), or other applicable occupational exposure limit;

* Expected concentration of each respiratory hazard;
* Immediately dangerous to life or health (IDLH) concentration;
* Oxygen concentration or expected oxygen concentration;
* Eye irritation potential; and
* Environmental factors, such as presence of oil aerosols.

1. **Step 1.** Is the respirator intended for use during firefighting?
2. If yes, only a full-facepiece, pressure-demand, self-contained breathing apparatus (SCBA) meeting the requirement of the NFPA 1981, Standard on Open-circuit Self-contained Breathing Apparatus for Fire and Emergency Services (2002 edition) is required. Information on NFPA 1981 can be found at [http://www.nfpa.org.](http://www.nfpa.org/)
3. If no, proceed to Step 2.
4. **Step 2.** Is the respirator intended for use in an oxygen-deficient atmosphere, i.e., less than 19.5% oxygen?
5. If yes, any type of SCBA other than escape only, or supplied-air respirator (SAR) with an auxiliary SCBA is required. Auxiliary SCBA must be of sufficient duration to permit escape to safety if the air supply is interrupted. If yes, and contaminants are also present, proceed to Step 3 to determine if the hazard requires the SCBA or SAR/SCBA to meet a specific APF level.
6. If no, proceed to Step 3.
7. **Step 3.** Is the respirator intended for entry into unknown or IDLH atmospheres (e.g., an emergency situation)?
8. If yes, one of two types of respirators are required: a pressure demand SCBA with a full facepiece or a pressure-demand SAR with a full facepiece in combination with an auxiliary pressure-demand SCBA. Auxiliary SCBA must be of sufficient duration to permit escape to safety if the air supply is interrupted.
9. If no, proceed to Step 4.
10. **Step 4.** Is the exposure concentration of the contaminants, as determined by acceptable industrial hygiene methods, less than the NIOSH REL or other applicable exposure limit?
11. If yes, a respirator is not required for routine work. For escape respirators, determine the potential for generation of a hazardous condition caused by an accident, spill or equipment failure. See Section IV. Page 17, for a discussion and selection of escape respirators. Proceed to Step 6. \*
12. If no, proceed to Step 5.

Note: If respirators are required by the employer to be worn (even if below the occupational exposure limit), OSHA requires that the employer establish and implement a written respiratory protection program with worksite specific procedures. If an employer provides respirators at the request of employees or permits employees to use their own respirators when exposure levels are below the applicable limits, this is considered voluntary respirator use. OSHA requires that employers provide to their employees the information contained in Appendix D of 29 CFR 1910.134, that they establish and implement those elements of a written program necessary to ensure that any employee using a respirator voluntarily is medically able to wear the respirator (except that medical evaluation is not required for voluntary use of filtering facepieces) and that the respirator is cleaned, stored, and maintained so that it does not represent a health hazard to the wearer.

1. **Step 5.** Are conditions such that a worker who is required to wear a respirator can escape from the work area and not suffer loss of life or immediate or delayed irreversible health effects if the respirator fails, i.e., are the conditions not immediately dangerous to life or health (IDLH)? IDLH values for certain compounds can be found in the [NIOSH Pocket Guide for Chemical Hazards](http://www.cdc.gov/niosh/npg/npg.html). IDLH values for some substances can also be found on the [NIOSH Website](https://www.cdc.gov/niosh/idlh/)
2. If yes, conditions are not considered to be IDLH. Proceed to Step 6.
3. If no, conditions are considered to be IDLH. Two types of respirators are recommended: a pressure-demand, full-facepiece SCBA or a pressure demand, full-facepiece SAR in combination with an auxiliary pressure demand, full-facepiece SCBA. The auxiliary SCBA must be of sufficient duration to permit escape to safety if the air supply is interrupted. An auxiliary unit means that the SAR unit includes a separate air bottle to provide a reserve source of air should the airline become damaged. The auxiliary unit shares the same mask and regulator, and enables the SAR to function as an SCBA if needed.
4. **Step 6.** Is the contaminant an eye irritant, or can the contaminant cause eye
5. damage at the workplace concentration? Information on eye irritation is included in the [International Programme on Chemical Safety](https://www.who.int/ipcs/en/), [International Chemical Safety Cards](https://www.cdc.gov/niosh/ipcs/default.html).
6. If yes, a respirator equipped with a full facepiece, helmet, or hood is recommended. Proceed to Step 7.
7. If no, a half-mask or quarter-mask respirator may still be an option, depending on the exposure concentration. Proceed to Step 7.
8. **Step 7.** Determine the maximum hazard ratio (HR) by the following:
   1. Divide the time-weighted average (TWA) exposure concentration for the contaminant determined in Step 4 by the NIOSH REL or other applicable exposure limit. If the exposure limit is an 8 hour limit the TWA used must be on 8 hour average. If the exposure limit is based on 10 hours, use a 10 hour TWA.
   2. If the contaminant has a ceiling limit, divide the maximum exposure concentration for the contaminant determined in Step 4 by the ceiling limit. If the contaminant has a short term exposure limit (STEL), divide the maximum 15 min TWA exposure concentration for the contaminant determined in Step 4 by the STEL.
   3. For escape respirators, determine the potential for generation of a hazardous condition caused by an accident or equipment failure.
   4. If a potentially hazardous condition could occur or a hazard ratio greater than 1 has been calculated, proceed to Step 8.
9. **Step 8.** If the physical state of the contaminant is:
   1. a particulate (solid or liquid aerosol) during periods of respirator use, proceed to Step 9;
   2. a gas or vapor, proceed to Step 10;
   3. a combination of gas or vapor and particulate, proceed to Step 11.
10. **Step 9.** Particulate Respirators
    1. Is the particulate respirator intended only for escape purposes?
       1. If yes, see Section IV (page 17), for a discussion and selection of escape respirators.
       2. If no, the particulate respirator is intended for use during normal work activities. Proceed to Step b.
    2. A filter series (N, R or P) that will provide protection against exposure to the particulate in question is recommended.
       1. The selection of N-, R-, and P-series filters depends on the presence or absence of oil particles, as follows:
          1. If no oil particles are present in thev work environment, use a filter of any series (i.e., N-, R-, or P-series).
          2. If oil particles (e.g., lubricants, cutting fluids, glycerine, etc.) are present, use an R- or P-series filter. Note: N-series filters cannot be used if oil particles are present.
          3. If oil particles are present and the filter is to be used for more than one work shift, use only a P-series filter.
    3. Note: To help you remember the filter series, use the following guide:
       1. N for Not resistant to oil,
       2. R for Resistant to oil
       3. P for oil Proof
       4. Selection of filter efficiency (i.e., 95%, 99%, or 99.97%) depends on how much filter leakage can be accepted. Higher filter efficiency means lower filter leakage.
          1. Additional information on selecting the appropriate filter certified under [42CFR84](https://www.cdc.gov/niosh/docs/96-101/). Proceed to Step 9.3.
    4. Respirators that have not been eliminated from Table 1 by the previous steps and that have APFs equal to, or greater than, the maximum hazard ratio determined in Step 7 are recommended.1 Note, however, that the maximum use concentration (MUC) is the maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected by a class of respirator and is determined by the lesser of:
       1. APF X exposure limit
       2. The respirator manufacturer’s MUC for a hazardous substance
       3. (if any) 1 If the respirator is intended for use in an oxygen-deficient atmosphere, only SCBA or SAR with an auxiliary SCBA, can be selected from the Table.
       4. The IDLH, unless the respirator is a pressure-demand, fullfacepiece SCBA or combination pressure-demand SAR with a full facepiece in combination with an auxiliary pressure-demand SCBA.
11. For multi-component mixtures the MUC can be calculated by:
12. **Step 10.** Gas/vapor Respirators
    1. Is the gas/vapor respirator intended only for escape?
       1. If yes, refer to escape respirators Section IV.
       2. If no, the gas/vapor respirator is intended for use during normal work activities. Proceed to Step 10.2.
    2. An air-purifying chemical cartridge/canister respirator is recommended that has a sorbent suitable for the chemical properties of the anticipated gas/vapor contaminant(s) and for the anticipated exposure levels. Information on cartridges or canisters approved for use for classes of chemicals or for specific gases or vapors can be found in the NIOSH [Certified Equipment List](http://www.cdc.gov/NIOSH/npptl/topics/respirators/cel/) Proceed to Step c.
    3. Respirators that have not been eliminated from Table 2 by the previous steps and that have APFs equal to, or greater than, the maximum hazard ratio determined in Step 7 are recommended.1 Note, however, that the maximum use concentration (MUC) is the maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected by a class of respirator and is determined by the lesser of:
       1. APF X exposure limit
       2. The respirator manufacturer’s MUC for a hazardous substance (if any)
       3. The IDLH, unless the respirator is a pressure-demand, fullfacepiece SCBA or combination pressure-demand SAR with a full facepiece in combination with an auxiliary pressure-demand SCBA.
13. For multi-component mixtures the MUC can be calculated by:
14. **Step 11.** Combination Particulate and Gas/Vapor Respirators
    1. Is the combination respirator intended for "escape only" purposes?
       1. If yes, refer to escape respirators on page 17, for a discussion and selection of "escape only" respirators.
       2. If no, the combination respirator is intended for use during normal work activities. Proceed to Step b.
    2. From Table 3, select a respirator type, not eliminated by the previous steps, and have APFs equal to, or greater than, the maximum hazard ratio determined in Step 7. are recommended.1 Note, however, that the maximum use concentration (MUC) is the maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected by a class of respirator and is determined by the lesser of:
       1. APF X exposure limit
       2. The respirator manufacturer’s MUC for a hazardous substance (if any)
       3. The IDLH, unless the respirator is a pressure-demand, fullfacepiece SCBA or combination pressure-demand SAR with a full facepiece in combination with an auxiliary pressure-demand SCBA.
15. For multi-component mixtures the MUC can be calculated by:

### Section 2: Medical Evaluations of Employees Required to Use Respirators

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.

The employer shall provide a medical evaluation to determine the employee’s ability to use a respirator before the employee is fit tested or required to use the respirator in the workplace. The employer may discontinue an employee’s medical evaluations when the employee is no longer required to use a respirator.

The employer shall identify a Physician or other Licensed Health Care Professional (PLHCP) to perform medical evaluations using a medical questionnaire or an initial medical examination that obtains the same information as the medical questionnaire.

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 contents. The employer shall provide the employee with an opportunity to discuss the questionnaire and examination results with the PLHCP.

The following information must be provided to the PLHCP before the PLHCP makes a recommendation concerning 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.
    - Temperature and humidity extremes that may be encountered.

The employer shall 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 OSHA Respirator Medical Evaluation Questionnaire (Mandatory),8CCR 5144(e) or whose initial medical examination demonstrates the need for a follow-up medical examination. The follow-up medical examination shall include any medical tests, consultation, or diagnostic procedures that the PLHCP deems necessary to make a final determination.

The medical evaluation questionnaire is described in 8 California Code of Regulations section 5144 [appendix C](https://www.dir.ca.gov/title8/5144c.html). for supplemental Information for the PLHCP see [Appendix D](#_Appendix_D:_Form:).

### Section 3: Fit Testing Procedures for Tight-Fitting Respirators

Before an employee may be required to use any respirator with a negative- or positive-pressure tight-fighting facepiece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used.

The employer shall ensure an employee using a tight-fitting facepiece respirator pass an appropriate Qualitative Fit Test (QLFT) or Quantitative Fit Test (QNFT) as stated in § 8CCR 5144(f) The employer shall ensure that an employee using a tight-fighting facepiece respirator is fit tested:

* Prior to initial use of the respirator.
* Whenever a different respirator facepiece (size, style, model, or make) is used.
* At least annually thereafter.

The employer shall conduct an additional fit test whenever the employee reports, or the employer, PLHCP, supervisor, or program administrator makes visual observations of, changes in the employee’s physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight (Respiratory Protection, 8 CCR 5144(f). A record of fit testing worksheet in included in Tab 3.

The fit test shall be administered using an OSHA-accepted QLFT or QNFT protocol.

QLFT may be used only to fit test negative-pressure APRs that must achieve a fit factor of 100 or less.

If the fit factor, as determined through an OSHA-accepted QNFT protocol, is equal to or greater than 100 for tight-fighting half facepieces, or equal to or greater than 500 for tight-fitting full facepieces, the QNFT has been passed with that respirator (Respiratory Protection, 8 CCR 5144 (f).

Fit testing of a tight-fitting SAR and PAPR shall be accomplished by performing quantitative or qualitative fit testing in the negative-pressure mode, regardless of the mode of operation (negative- or positive-pressure) that is used for respiratory protection.

* Quantitative fit testing of these respirators shall be accomplished by temporarily converting the respirator user’s actual facepiece into a negative-pressure respirator with appropriate filters, or by using an identical negative-pressure air-purifying respirator facepiece with the same sealing surfaces as a surrogate for the atmosphere-supplying or PAPR facepiece.
* Quantitative fit testing of these respirators shall be accomplished by modifying the facepiece to allow sampling inside the facepiece in the breathing zone of the user, midway between the nose and mouth. This requirement shall be accomplished by installing a permanent sampling probe onto a surrogate facepiece, or by using a sampling adapter designed to temporarily provide a means of sampling air from inside the facepiece.
* Any modifications to the respirator facepiece for fit testing shall be completely removed, and the facepiece restored to NIOSH-approved configuration, before that facepiece can be used in the workplace.

### Fit-Testing Procedures

Source: Fit Testing 8 CCR 5144 Appendix A.

#### OSHA-Accepted Fit Test Protocols

1. 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 qualitative fit test (QLFT) and quantitative fit test (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 facepiece up to the face and eliminate those that obviously do not give an acceptable fit.
5. The more acceptable facepieces 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:
   1. Position of the mask on the nose.
   2. Room for eye protection.
   3. Room to talk.
   4. Position of mask on face and cheeks.
7. The following criteria shall be used to help determine the adequacy of the respirator fit:
   1. Chin properly placed.
   2. Adequate strap tension, not overly tightened.
   3. Fit across nose bridge.
   4. Respirator of proper size to span distance from nose to chin.
   5. Tendency of respirator to slip.
   6. 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 facepiece shall be selected and retested if the test subject fails the user seal check tests.

1. The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.
2. 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.
3. 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.
4. 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.

1. The fit test shall be performed while the test subject is wearing any applicable safety equipment that may be worn during actual respirator use which could interfere with respirator fit.
2. Test Exercises
   1. 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.
      1. The test subject shall perform exercises, in the test environment, in the following manner:
      2. Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.
      3. Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.
      4. 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.
      5. 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).
      6. 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.
      7. 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.
      8. Grimace. The test subject shall grimace by smiling or frowning. (This applies only to QNFT testing; it is not performed for QLFT)
      9. 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.
      10. Normal breathing. Same as exercise (1).(b) 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.
3. Qualitative Fit Test (QLFT) Protocols
   1. General
      1. 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.
      2. The employer shall ensure that QLFT equipment is kept clean and well maintained so as to operate within the parameters for which it was designed.
   2. Isoamyl Acetate Protocol

Note**:** This protocol is not appropriate to use for the fit testing of particulate respirators. If used to fit test particulate respirators, the respirator must be equipped with an organic vapor filter.

* + 1. Odor Threshold Screening

Odor threshold screening, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of isoamyl acetate at low levels.

* + - 1. Three 1-liter glass jars with metal lids are required.
      2. Odor-free water (e.g., distilled or spring water) at approximately 25 deg. C (77 deg. F) shall be used for the solutions.
      3. The isoamyl acetate (IAA) (also known at isopentyl acetate) stock solution is prepared by adding 1 ml of pure IAA to 800 ml of odor-free water in a 1-liter jar, closing the lid and shaking for 30 seconds. A new solution shall be prepared at least weekly.
      4. The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well-ventilated to prevent the odor of IAA from becoming evident in the general room air where testing takes place.
      5. The odor test solution is prepared in a second jar by placing 0.4 ml of the stock solution into 500 ml of odor-free water using a clean dropper or pipette. The solution shall be shaken for 30 seconds and allowed to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only one day.
      6. A test blank shall be prepared in a third jar by adding 500 cc of odor-free water.
      7. The odor test and test blank jar lids shall be labeled (e.g., 1 and 2) for jar identification. Labels shall be placed on the lids so that they can be peeled off periodically and switched to maintain the integrity of the test.
      8. The following instruction shall be typed on a card and placed on the table in front of the two test jars (i.e., 1 and 2): “The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil.”
      9. The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.
      10. If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.
      11. If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to respirator selection and fit testing.
    1. Isoamyl Acetate Fit Test
       1. The fit test chamber shall be a clear 55-gallon drum liner suspended inverted over a 2-foot diameter frame so that the top of the chamber is about 6 inches above the test subject's head. If no drum liner is available, a similar chamber shall be constructed using plastic sheeting. The inside top center of the chamber shall have a small hook attached.
       2. Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors.
       3. After selecting, donning, and properly adjusting a respirator, the test subject shall wear it to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection,and shall be well-ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.
       4. A copy of the test exercises and any prepared text from which the subject is to read shall be taped to the inside of the test chamber.
       5. Upon entering the test chamber, the test subject shall be given a 6-inch by 5-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with 0.75 ml of pure IAA. The test subject shall hang the wet towel on the hook at the top of the chamber. An IAA test swab or ampoule may be substituted for the IAA wetted paper towel provided it has been demonstrated that the alternative IAA source will generate an IAA test atmosphere with a concentration equivalent to that generated by the paper towel method.
       6. Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of his/her cooperation, and the purpose for the test exercises; or to demonstrate some of the exercises.
       7. If at any time during the test, the subject detects the banana-like odor of IAA, the test is failed. The subject shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.
       8. If the test is failed, the subject shall return to the selection room and remove the respirator. The test subject shall repeat the odor sensitivity test, select and put on another respirator, return to the test area and again begin the fit test procedure described in (b) (1) through (7) above. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait at least 5 minutes before retesting. Odor sensitivity will usually have returned by this time.
       9. If the subject passes the test, the efficiency of the test procedure shall be demonstrated by having the subject break the respirator face seal and take a breath before exiting the chamber. When the test subject leaves the chamber, the subject shall remove the saturated towel and return it to the person conducting the test, so that there is no significant IAA concentration buildup in the chamber during subsequent tests. The used towels shall be kept in a self-sealing plastic bag to keep the test area from being contaminated.
  1. Saccharin Solution Aerosol Protocol

The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

* + 1. Taste threshold screening.

The saccharin taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of saccharin.

* + - 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 in diameter by 14 inches tall with at least the front portion clear and that allows free movements of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts #FT 14 and #FT 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/her slightly open mouth with tongue extended. The subject is instructed to report when he/she detects a sweet taste.
      4. Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. The nozzle is directed away from the nose and mouth of the person. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.
      5. The threshold check solution is prepared by dissolving 0.83 gram of sodium saccharin USP in 100 ml of warm water. It can be prepared by putting 1 ml of the fit test solution (see (b)(5) below) in 100 ml of distilled water.
      6. To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand.
      7. Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted. If the test subject reports tasting the sweet 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 saccharin is tasted. If the test subject reports tasting the sweet 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 saccharin is tasted. If the test subject reports tasting the sweet 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 saccharin is not tasted after 30 squeezes (step 10), the test subject is unable to taste saccharin and may not perform the saccharin fit test. Note to paragraph 3. (a): If the test subject eats or drinks something sweet before the screening test, he/she may be unable to taste the weak saccharin solution.
      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 dry, and refilled at least each morning and afternoon or at least every four hours.
    1. Saccharin 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 described in 3. (a) above.
       3. The test subject shall don the enclosure while wearing the respirator selected in section I. A. of this appendix. The respirator shall be properly adjusted and equipped with a particulate filter(s).
       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 be clearly marked to distinguish it from the screening test solution nebulizer.
       5. The fit test solution is prepared by adding 83 grams of sodium saccharin to 100 ml of warm water.
       6. As before, the test subject shall breathe through the slightly open mouth with tongue extended, and report if he/she tastes the sweet taste of saccharin.
       7. The nebulizer is inserted into the hole in the front of the enclosure and an initial concentration of saccharin 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. A minimum of 10 squeezes is required.
       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 original 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 saccharin is detected. If the test subject does not report tasting the saccharin, the test is passed.
       11. If the taste of saccharin 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).
       12. Since the nebulizer has a tendency to clog during use, the test operator must make periodic checks of the nebulizer to ensure that it is not clogged. If clogging is found at the end of the test session, the test is invalid.
  1. BitrexTM (Denatonium Benzoate) Solution Aerosol Qualitative Fit Test Protocol

The BitrexTM (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.

* + 1. 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 #FT 14 and #FT 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 (NaCl) 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.
    2. 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. (a) 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(s).
       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 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 (NaCl) 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).
  1. Irritant Smoke (Stannic Chloride) Protocol

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

* + 1. 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.
    2. 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.
    1. Irritant Smoke Fit Test Procedure
       1. The person being fit tested shall don the respirator without assistance, and perform the required user seal check(s).
       2. The test subject shall be instructed to keep his/her eyes closed.
       3. The test operator shall direct the stream of irritant smoke from the smoke tube toward the face seal area of the test subject, using the low flow pump or the squeeze bulb. The test operator shall begin at least 12 inches from the facepiece and move the smoke stream around the whole perimeter of the mask. The operator shall gradually make two more passes around the perimeter of the mask, moving to within six inches of the respirator.
       4. If the person being tested has not had an involuntary response and/or detected the irritant smoke, proceed with the test exercises.
       5. The exercises identified in 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.
       6. If the person being fit tested reports detecting the irritant smoke at any time, the test is failed. The person being retested must repeat the entire sensitivity check and fit test procedure.
       7. Each test subject passing the irritant smoke test without evidence of a response (involuntary cough, irritation) shall be given a second sensitivity screening check, with the smoke from the same smoke tube used during the fit test, once the respirator has been removed, to determine whether he/she still reacts to the smoke. Failure to evoke a response shall void the fit test.
       8. If a response is produced during this second sensitivity check, then the fit test is passed.

1. Quantitative Fit Test (QNFT) Protocols
   1. Generated Aerosol Quantitative Fit Testing Protocol
      1. Apparatus.
         1. Instrumentation. Aerosol generation, dilution, and measurement systems using particulates (corn oil, polyethylene glycol 400 [PEG 400], di-2-ethyl hexyl sebacate [DEHS] or sodium chloride) as test aerosols shall be used for quantitative fit testing.
         2. Test chamber. The test chamber shall be large enough to permit all test subjects to perform freely all required exercises without disturbing the test agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the test agent is effectively isolated from the ambient air, yet uniform in concentration throughout the chamber.
         3. When testing air-purifying respirators, the normal filter or cartridge element shall be replaced with a high efficiency particulate air (HEPA) or P100 series filter supplied by the same manufacturer.
         4. The sampling instrument shall be selected so that a computer record or strip chart record may be made of the test showing the rise and fall of the test agent concentration with each inspiration and expiration at fit factors of at least 2,000. Integrators or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise may be used provided a record of the readings is made.
         5. The combination of substitute air-purifying elements, test agent and test agent concentration shall be such that the test subject is not exposed in excess of an established exposure limit for the test agent at any time during the testing process, based upon the length of the exposure and the exposure limit duration.
         6. The sampling port on the test specimen respirator shall be placed and constructed so that no leakage occurs around the port (e.g., where the respirator is probed), a free air flow is allowed into the sampling line at all times, and there is no interference with the fit or performance of the respirator. The in-mask sampling device (probe) shall be designed and used so that the air sample is drawn from the breathing zone of the test subject, midway between the nose and mouth and with the probe extending into the facepiece cavity at least 1/4 inch.
         7. The test setup shall permit the person administering the test to observe the test subject inside the chamber during the test.
         8. The equipment generating the test atmosphere shall maintain the concentration of test agent constant to within a 10 percent variation for the duration of the test.
         9. The time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) shall be kept to a minimum. There shall be a clear association between the occurrence of an event and its being recorded.
         10. The sampling line tubing for the test chamber atmosphere and for the respirator sampling port shall be of equal diameter and of the same material. The length of the two lines shall be equal.
         11. The exhaust flow from the test chamber shall pass through an appropriate filter (i.e., high efficiency particulate filter) before release.
         12. When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed 50 percent.
         13. The limitations of instrument detection shall be taken into account when determining the fit factor.
         14. Test respirators shall be maintained in proper working order and be inspected regularly for deficiencies such as cracks or missing valves and gaskets.
      2. Procedural Requirements.
         1. When performing the initial user seal check using a positive or negative pressure check, the sampling line shall be crimped closed in order to avoid air pressure leakage during either of these pressure checks.
         2. The use of an abbreviated screening QLFT test is optional. Such a test may be utilized in order to quickly identify poor fitting respirators that passed the positive and/or negative pressure test and reduce the amount of QNFT time. The use of the CNC QNFT instrument in the count mode is another optional method to obtain a quick estimate of fit and eliminate poor fitting respirators before going on to perform a full QNFT.
         3. A reasonably stable test agent concentration shall be measured in the test chamber prior to testing. For canopy or shower curtain types of test units, the determination of the test agent's stability may be established after the test subject has entered the test environment.
         4. Immediately after the subject enters the test chamber, the test agent concentration inside the respirator shall be measured to ensure that the peak penetration does not exceed 5 percent for a half mask or 1 percent for a full facepiece respirator.
         5. A stable test agent concentration shall be obtained prior to the actual start of testing.
         6. Respirator restraining straps shall not be over-tightened for testing. The straps shall be adjusted by the wearer without assistance from other persons to give a reasonably comfortable fit typical of normal use. The respirator shall not be adjusted once the fit test exercises begin.
         7. The test shall be terminated whenever any single peak penetration exceeds 5 percent for half masks and 1 percent for full facepiece respirators. The test subject shall be refitted and retested.
         8. Calculation of fit factors.
            1. The fit factor shall be determined for the quantitative fit test by taking the ratio of the average chamber concentration to the concentration measured inside the respirator for each test exercise except the grimace exercise.
            2. The average test chamber concentration shall be calculated as the arithmetic average of the concentration measured before and after each test (i.e., 7 exercises) or the arithmetic average of the concentration measured before and after each exercise or the true average measured continuously during the respirator sample.
            3. The concentration of the challenge agent inside the respirator shall be determined by one of the following methods:

Average peak penetration method means the method of determining test agent penetration into the respirator utilizing a strip chart recorder, integrator, or computer. The agent penetration is determined by an average of the peak heights on the graph or by computer integration, for each exercise except the grimace exercise. Integrators or computers that calculate the actual test agent penetration into the respirator for each exercise will also be considered to meet the requirements of the average peak penetration method.

Maximum peak penetration method means the method of determining test agent penetration in the respirator as determined by strip chart recordings of the test. The highest peak penetration for a given exercise is taken to be representative of average penetration into the respirator for that exercise.

Integration by calculation of the area under the individual peak for each exercise except the grimace exercise. This includes computerized integration.

The calculation of the overall fit factor using individual exercise fit factors involves first converting the exercise fit factors to penetration values, determining the average, and then converting that result back to a fit factor. This procedure is described in the following equation:

Where ff1, ff2, ff3, etc. are the fit factors for exercises 1, 2, 3, etc.

* + - 1. The test subject shall not be permitted to wear a half mask or quarter facepiece respirator unless a minimum fit factor of 100 is obtained, or a full facepiece respirator unless a minimum fit factor of 500 is obtained.
      2. Filters used for quantitative fit testing shall be replaced whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media.
  1. Ambient Aerosol Condensation Nuclei Counter (CNC) Quantitative Fit Testing Protocol

The ambient aerosol condensation nuclei counter (CNC) quantitative fit testing (PortacountTM) protocol quantitatively fit tests respirators with the use of a probe. The probed respirator is only used for quantitative fit tests. A probed respirator has a special sampling device installed on the respirator that allows the probe to sample the air from inside the mask. A probed respirator is required for each make, style, model, and size that the employer uses and can be obtained from the respirator manufacturer or distributor. The CNC instrument manufacturer, TSI Inc., also provides probe attachments (TSI sampling adapters) that permit fit testing in an employee's own respirator. A minimum fit factor pass level of at least 100 is necessary for a half-mask respirator and a minimum fit factor pass level of at least 500 is required for a full facepiece negative pressure respirator. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

* + 1. Portacount Fit Test Requirements.
       1. Check the respirator to make sure the sampling probe and line are properly attached to the facepiece and that the respirator is fitted with a particulate filter capable of preventing significant penetration by the ambient particles used for the fit test (e.g., NIOSH 42 C.F.R. 84 series 100, series 99, or series 95 particulate filter) per manufacturer's instruction.
       2. Instruct the person to be tested to don the respirator for five minutes before the fit test starts. This purges the ambient particles trapped inside the respirator and permits the wearer to make certain the respirator is comfortable. This individual shall already have been trained on how to wear the respirator properly.
       3. Check the following conditions for the adequacy of the respirator fit: Chin properly placed; Adequate strap tension, not overly tightened; Fit across nose bridge; Respirator of proper size to span distance from nose to chin; Tendency of the respirator to slip; Self-observation in a mirror to evaluate fit and respirator position.
       4. Have the person wearing the respirator do a user seal check. If leakage is detected, determine the cause. If leakage is from a poorly fitting facepiece, try another size of the same model respirator, or another model of respirator.
       5. Follow the manufacturer's instructions for operating the Portacount and proceed with the test.
       6. The test subject shall be instructed to perform the exercises in section I. A. 14. of this appendix.
       7. After the test exercises, 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.
    2. Portacount Test Instrument.
       1. The Portacount will automatically stop and calculate the overall fit factor for the entire set of exercises. The overall fit factor is what counts. The Pass or Fail message will indicate whether or not the test was successful. If the test was a Pass, the fit test is over.
       2. Since the pass or fail criterion of the Portacount is user programmable, the test operator shall ensure that the pass or fail criterion meet the requirements for minimum respirator performance in this Appendix.
       3. A record of the test needs to be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style, and size of respirator used; and date tested.
       4. Controlled negative pressure (CNP) quantitative fit testing protocol.

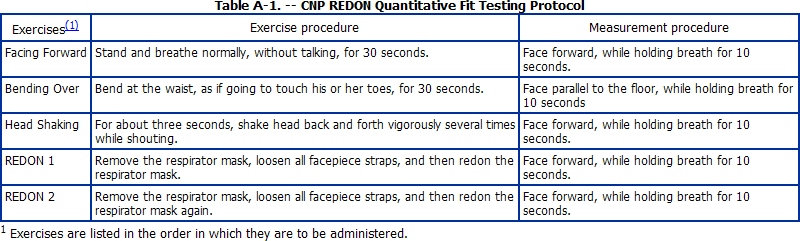
The CNP protocol provides an alternative to aerosol fit test methods. The CNP fit test method technology is based on exhausting air from a temporarily sealed respirator facepiece to generate and then maintain a constant negative pressure inside the facepiece. The rate of air exhaust is controlled so that a constant negative pressure is maintained in the respirator during the fit test. The level of pressure is selected to replicate the mean inspiratory pressure that causes leakage into the respirator under normal use conditions. With pressure held constant, air flow out of the respirator is equal to air flow into the respirator. Therefore, measurement of the exhaust stream that is required to hold the pressure in the temporarily sealed respirator constant yields a direct measure of leakage air flow into the respirator. The CNP fit test method measures leak rates through the facepiece as a method for determining the facepiece fit for negative pressure respirators. The CNP instrument manufacturer Dynatech Nevada also provides attachments (sampling manifolds) that replace the filter cartridges to permit fit testing in an employee's own respirator. To perform the test, the test subject closes his or her mouth and holds his/her breath, after which an air pump removes air from the respirator facepiece at a pre-selected constant pressure. The facepiece fit is expressed as the leak rate through the facepiece, expressed as milliliters per minute. The quality and validity of the CNP fit tests are determined by the degree to which the in-mask pressure tracks thetest pressure during the system measurement time of approximately five seconds. Instantaneous feedback in the form of a real-time pressure trace of the in-mask pressure is provided and used to determine test validity and quality. A minimum fit factor pass level of 100 is necessary for a half-mask respirator and a minimum fit factor of at least 500 is required for a full facepiece respirator. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

1. CNP Fit Test Requirements.
   1. The instrument shall have a non-adjustable test pressure of 15.0 mm water pressure.
   2. The CNP system defaults selected for test pressure shall be set at -- 15 mm of water (-0.58 inches of water) and the modeled inspiratory flow rate shall be 53.8 liters per minute for performing fit tests. (Note: CNP systems have built-in capability to conduct fit testing that is specific to unique work rate, mask, and gender situations that might apply in a specific workplace. Use of system default values, which were selected to represent respirator wear with medium cartridge resistance at a low-moderate work rate, will allow inter-test comparison of the respirator fit.)
   3. The individual who conducts the CNP fit testing shall be thoroughly trained to perform the test.
   4. The respirator filter or cartridge needs to be replaced with the CNP test manifold. The inhalation valve downstream from the manifold either needs to be temporarily removed or propped open.
   5. The test subject shall be trained to hold his or her breath for at least 20 seconds.
   6. The test subject shall don the test respirator without any assistance from the individual who conducts the CNP fit test.
   7. The QNFT protocol shall be followed according to section I.C. 1. of this appendix with an exception for the CNP test exercises.
2. CNP Test Exercises.
   1. Normal breathing. In a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject needs to hold head straight ahead and hold his or her breath for 10 seconds during the test measurement.
   2. Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply for 1 minute, being careful not to hyperventilate. After the deep breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during test measurement.
   3. Turning head side to side. Standing in place, the subject shall slowly turn his or her head from side to side between the extreme positions on each side for 1 minute. The head shall be held at each extreme momentarily so the subject can inhale at each side. After the turning head side to side exercise, the subject needs to hold head full left and hold his or her breath for 10 seconds during test measurement. Next, the subject needs

to hold head full right and hold his or her breath for 10 seconds during test measurement.

* 1. Moving head up and down. Standing in place, the subject shall slowly move his or her head up and down for 1 minute. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling). After the moving head up and down exercise, the subject shall hold his or her head full up and hold his or her breath for 10 seconds during test measurement. Next, the subject shall hold his or her head full down and hold his or her breath for 10 seconds during test measurement.
  2. 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 for 1 minute. After the talking exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.
  3. Grimace. The test subject shall grimace by smiling or frowning for 15 seconds.
  4. Bending Over. The test subject shall bend at the waist as if he or she were to touch his or her toes for 1 minute. Jogging in place shall be substituted for this exercise in those test environments such as shroud- type QNFT units that prohibit bending at the waist. After the bending over exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement.
  5. Normal Breathing. The test subject shall remove and re-don the respirator within a one-minute period. Then, in a normal standing position, without talking, the subject shall breathe normally for 1 minute. After the normal breathing exercise, the subject shall hold his or her head straight ahead and hold his or her breath for 10 seconds during the test measurement. After the test exercises, 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 a respirator shall be tried.

1. CNP Test Instrument.
   1. The test instrument shall have an effective audio warning device when the test subject fails to hold his or her breath during the test. The test shall be terminated whenever the test subject failed to hold his or her breath. The test subject may be refitted and retested.
   2. A record of the test shall be kept on file, assuming the fit test was successful. The record must contain the test subject's name; overall fit factor; make, model, style and size of respirator used; and date tested.
      * 1. Controlled Negative Pressure (CNP) REDON Fit Test Protocol.
2. When administering this protocol to test subjects, employers must comply with the requirements specified in paragraphs (a) and (c) of Part I.C.4 of this appendix ("Controlled negative pressure (CNP) quantitative fit testing protocol"), as well as use the test exercises described below in paragraph (b) of this protocol instead of the test exercises specified in paragraph (b) of Part I.C.4 of this appendix.
3. Employers must ensure that each test subject being fit tested using this protocol follows the exercise and measurement procedures, including the order of administration, described below in Table A-1 of this appendix.



1. After completing the test exercises, the test administrator must question each test subject regarding the comfort of the respirator. When a test subject states that the respirator is unacceptable, the employer must ensure that the test administrator repeats the protocol using another respirator model.
2. Employers must determine the overall fit factor for each test subject by calculating the harmonic mean of the fit testing exercises as follows:

Where:

N = The number of exercises;

FF1 = The fit factor for the first exercise;

FF2 = The fit factor for the second exercise; and FFN = The fit factor for the nth exercise.

### Section 4: Procedures for Proper Use of Respirators in Routine and Reasonably Foreseeable Emergency Situations

The selection of a specific respirator must be made by individuals knowledgeable about the limitations associated with each class of respirators and familiar with the actual workplace environment, including the job task(s) to be performed.

The correct use of a respirator is just as important as the selection process if adequate worker protection is to be achieved. Without a complete respiratory protection program, workers will not receive the degree of protection anticipated from a respirator, even if it is a correct choice for the situation.

The employer is required to establish and implement procedures for the proper use of respirators that include prohibiting conditions that may result in facepiece seal leakage, preventing employees from removing respirators in hazardous environments, taking actions to ensure continued effective respirator operation throughout the work shift and establishing procedures for the user of respirators in IDLH atmospheres or in interior structural firefighting situations (Respiratory Protection, 8 CCR 5144(g).

#### User Seal Check

A user seal check must be conducted by each user before each use of the respirator (User Seal Check Procedures [Mandatory], Appendix B-1 to 8 CCR 5144). User Seal Check procedures follow.

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 below (User Seal Check Procedures [Mandatory], Appendix B-1, 8 CCR 5144), or the respirator manufacturer’s recommended user seal check method shall be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

The user conducts the following:

* + - Positive-Pressure Check: Close off the exhalation valve and exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece 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 carefully replacing it after the test.
    - 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 placing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for 10 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 facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

The respirator manufacturer’s recommended procedures for performing a user seal check may be used instead of the positive- and negative pressure-check procedures listed above, provided that the employer demonstrates that the manufacturer’s procedures are equally effective.

#### Adequate Warning Properties

No physiological effects in humans (e.g., odor, taste, eye irritation, respiratory irritation) have been demonstrated as being capable of consistently providing respirator wearers with timely, consistent, persistent, and reliable warning of hazardous airborne concentrations inside a respirator. Individual wearers may be unable to detect the warning effect when necessary and may fail to take action necessary to protect themselves (e.g., leaving the area where respirators are necessary or changing the sorbent cartridge, canister, and/or filters).

#### Service Life Information

A cartridge’s useful service life is how long it provides adequate protection from harmful chemicals in the air. The service life of a cartridge depends upon many factors, including:

* + - Environmental conditions to include relative humidity through each sorbent element.
    - Breathing rate.
    - Cartridge filtering capacity.
    - The make and model of sorbent material.
    - The amount of contaminants in the air.

Respirators with air-purifying sorbent elements shall be used with caution and with recognition of the wide variability of service lives under differing use conditions.

Tools used in the assessment of canister, cartridge, and filter use includes such information as the employer’s exposure assessment and information based on manufacturer’s and/or NIOSH breakthrough test data, mathematically based estimates, and/or reliable use recommendations from the employer’s respirator and/or chemical suppliers.

Reliance on odor thresholds and other warning properties will not be permitted as the primary basis for determining the service life of gas and vapor cartridges and canisters. OSHA emphasizes that a conservative approach is recommended when evaluating service life testing data. Temperature, humidity, air flow through the filter, the work rate, and the presence of other potential interfering chemicals in the workplace all can have a serious effect on the service life of an air-purifying cartridge or canister.

Canisters, cartridges, and filters shall be changed when:

* + - The canister, cartridge, and/or filter has been used in a hazardous environment one time.
    - The canister, cartridge, and/or filter becomes wet.
    - The user notices increased resistance.
    - The user detects an odor or taste while using the canister or cartridge.
    - The cartridge, canister, and/or filter reaches the manufacturer’s expiration date on The canister, cartridge, and/or filter.

In the absence of any of the aforementioned factors, canisters, cartridges, and/or filter shall be discarded and destroyed no later than five years after date of purchase of the canister, cartridge, or filter if unopened or end of service life provided by the manufacture if unopened.

Chemical Contaminant Migration: The employer and user should be aware that some contaminants have a tendency to migrate through cartridge/canister sorbent material during periods of storage or nonuse. This is characteristic of the contaminant-carbon bed interaction for organic chemicals with boiling points below 65° centigrade and would predictably shorten breakthrough times. In cases where respirators are used for multiple days, this could present an additional exposure to the respirator user. Where contaminant migration is possible, respirator cartridges/canisters should be changed after every work shift where exposure occurs, unless the employer has specific objective data to the contrary (desorption studies) showing the performance of the cartridge in the conditions and schedule of use/nonuse found in the workplace (OSHA, 2004).

The Gerry O. Wood Mathematical Model and the Yoon Nelson Mathematical Model may also be used. These mathematical models may be referenced on the OSHA website in the etools section ([http://www.osha.gov/SLTC/etools/respiratory/change\_schedule\_mathmodel.html).](http://www.osha.gov/SLTC/etools/respiratory/change_schedule_mathmodel.html))

Classes of respirators offering greater protection can usually be used in place of the minimum acceptable class of respirators. Respirator classes are consistent with respirator certification groupings as specified in 42 C.F.R. Part 84 (2012).

#### Respirator Use Limitations

Recommendations in decision logic for respirator selection are based primarily on the physical, chemical, and toxicological properties of the contaminant and on the limitations of each class of respirators, including filtration efficiency, air supply capability, and face seal characteristics and leakage. Section 1: Procedures for Selecting Respirators for Use in the Workplace includes an assessment tool, NIOSH Decision Logic for Respirator Selection, which is useful in respirator selection.

Negative-pressure respirators shall not be used when facial scars or deformities interfere with the face seal. No respirator (including positive-pressure respirators) shall be used when facial hair interferes with the face seal (Respiratory Protection, 8 CCR 5144(g).

Respirators shall be properly maintained, correctly used, and conscientiously worn. The usage limitations of air-purifying elements, particularly gas and vapor cartridges, shall not be exceeded. The respirator must be approved by the National Institute for Occupational Safety and Health (NIOSH).

Employees are to leave the contaminated area immediately on suspicion of respirator failure and then determine the problem (Respiratory Protection, 8 CCR 5144(g).

Employees are not exposed to a single unvarying concentration of a hazardous substance; rather individual exposures may vary throughout a work shift and between days. The highest anticipated concentration shall, therefore, be used to compute the required protection factor for each respirator user. Respirator wearers shall be aware of the variability in human responses to the warning properties of hazardous substances.

##### Facial Hair

Facial hair that lies along the sealing area of the respirator, such as beards, sideburns, moustaches, or even a few days growth of stubble may interfere with the respirator seal of tight- fitting respirators. These conditions shall be avoided when using tight-fitting respirators. Facial hair between the wearer’s skin and the sealing surfaces of the respirator will prevent an adequate seal. A respirator that permits negative-air pressure inside the facepiece during inhalation may allow leakage and, in the case or positive-pressure devices, will either reduce service time or waste breathing air. An employee shall not enter a contaminated work area when conditions prevent an adequate seal of the respirator facepiece to the face (Respiratory Protection, 8 CCR 5144(g)).

##### Facial Deformities

Facial deformities, such as scars, deep skin creases, prominent cheekbones, severe acne, and the lack of teeth or dentures, can prevent a respirator from sealing properly (Respiratory Protection, 8 CCR 5144(g).

##### Eye Glasses

Ordinary eye glasses shall not be used with full-facepiece respirators. Eye glasses with temple bars or straps that pass between the sealing surface of the full-facepiece and the worker’s face will prevent an adequate seal, and shall not be used. Special corrective lenses can be mounted inside full-facepiece respirators and are available from all manufacturers of full-facepiece respirators. To ensure good vision, comfort, and proper sealing of the facepiece, these corrective lenses shall be mounted by an individual designated by the manufacturer as qualified to install accessory items (Respiratory Protection, 8 CCR 5144(g)).

Eye glasses and goggles may interfere with the half facepieces. When interference occurs, a full-facepiece with special corrective lenses shall be provided and worn

##### Contact Lenses

Several factors may restrict or even prohibit the use of contact lenses while wearing any type of respiratory device. This is especially true of atmosphere-supplying respirators. With full facepieces, incoming air directed toward the eye can cause discomfort from dirt, lint, or other debris lodging between the contact lens and the pupil.

##### Communication

Talking while wearing a respirator equipped with a facepiece may break the seal of the facepiece. When communication is necessary within a contaminated area, it should be done with the help of special communicating equipment obtained from the manufacturer of the respirator or designed for use with the respirator.

##### In Dangerous Atmospheres

At least one standby person, equipped with proper rescue equipment including an SCBA, shall be preset in the nearest safe area for emergency rescue of those wearing respirators in an IDLH atmosphere. The 2-in, 2-out buddy system is recommended. Communications (visual, voice, signal line, telephone, radio, or other suitable type) shall be maintained among all people present (those in the IDLH atmosphere and the standby people).

Confined spaces are enclosures that are difficult to get out of, such as storage tanks, tank cars, boilers, sewers, tunnels, pipelines, pits, and tubs. Some enclosed buildings may be considered as confined spaces when IDLH atmospheres occur due to intentional or accidental introduction of hazardous environments. OSHA defines confined space in § 8 CCR 5157: “(1) is large enough and so configured that an employee can bodily enter and perform assigned work; and have limited or restricted means for entry or exit…; and (3) is not designed for continuous employee occupancy.”

The atmospheres in a confined space may be IDLH because of toxic air contaminants or lack of oxygen. Before anyone enters a confined space, tests shall be made to determine the presence and concentration of any flammable vapor or gas, or any toxic airborne particulate, vapor, or gas, and to determine the oxygen concentration.

No one shall enter if a flammable substance exceeds the LEL. No one shall enter without wearing the proper type of respirator if any air contaminant exceeds the established PEL or if there is an oxygen deficiency.

If the atmosphere in a confined space is IDLH owing to a high concentration of air contaminant or oxygen deficiency, those who must enter the space shall wear a pressure-demand SCBA or a combination pressure-demand airline and SCBA that always maintains positive-air pressure inside the respiratory inlet covering.

##### In Low and High Temperatures

Low temperatures may fog respirator lenses. Coating the inner surface of the lens with an antifogging compound normally available from the manufacturer should prevent fogging down to 32°F, but severe fogging may occur below 0°F. Full facepieces with nose cups that direct the warm, moist exhaled air through the exhalation valve without its touching the nose are available. They should provide satisfactory vision at as low as -30°F.

At very low temperatures, exhalation valves may freeze due to moisture. Dry respirable air should be used with airline respirators and with the type of SCBA that has an air cylinder when they are used in low temperatures. The minimum temperature that an SCBA should be used, and has been tested and approved is listed on the approval label.

A person working in high temperature air is under physiological stress. Wearing a respirator causes additional stress which should be minimized by using a light-weight respirator with low breathing resistance.

Users must be aware of the signs and symptoms of heat stress, including heat cramps, heat exhaustion, and heat stroke. Heat stroke is a true medical emergency and should not be ignored.

##### Physiological Response to Respirator Use

Wearing any respirator, alone or in conjunction with other types of protective equipment, will impose some physiological stress on the wearer. Weight of the equipment, for example, increases the energy requirement for a given task.

Use of respirators in conjunction with protective clothing can greatly affect the human response and endurance, especially in hot environments. Normally, in hot environments or during heavy work, the body relies a great deal on heat loss through the evaporation of sweat. With impermeable clothing, the heat loss by water evaporation is not possible.

To reduce the incidence of heat stress, reduce work rate by:

* + Adjusting the work/rest schedules.
  + Using automated procedures and/or mechanical assistance where possible.
  + Minimize the work intensity.
  + Include periodic fluid/water replacement breaks and consider cooling garments.

#### Orientation/Training Tool: Procedures for Proper Use of Respirators in Routine and Reasonably Foreseeable Emergency Situations

Employee Name: Date:

* The correct use of a respirator is just as important as the selection process if adequate worker protection is to be achieved. Putting a respirator on is known as “donning.” Removing a respirator is known as “doffing.”
* Procedures for donning (putting on) the respirator includes:
  + Loosen the harness head straps on the facepiece so the end-tabs are approximately one inch from the buckle.
  + Hold the facepiece by the straps and put the chin in first.
  + Then, pull the harness back over the head.
  + Tighten the straps using the ABC method: “A” bove straps, “B”elow the chin straps, “C”enter straps. Tighten the straps using short, jerky motions.
  + Conduct a user seal check. If an airtight seal is not achieved, adjust the straps and perform the user seal check again. Continue this process until an airtight seal is achieved.
* Procedures for doffing (removing) the respirator includes:
  + Return to an uncontaminated area before removing the respirator. Perform self- decontamination or proceed through an established decontamination line.
  + To remove the facepiece, loosen the bottom chin straps of the respirator.
  + Grasp the facepiece by the speaking diaphragm (voicemitter) and pull it up and away from your face.
* The employee is competent in the user seal check process; this user seal check process must be conducted by each user before each use of the respirator. User Seal Check Procedures (mandatory).
* The user is aware of the following: Adequate Warning Properties.

No physiological effects in humans (e.g., odor, taste, eye irritation, respiratory irritation) have been demonstrated as being capable of consistently providing respirator wearers with timely, consistent, persistent, and reliable warning of hazardous airborne concentrations inside a respirator. Individual wearers may be unable to detect the warning effect when necessary and may fail to take action necessary to protect themselves (e.g., leaving the area where respirators are necessary or changing the sorbent cartridge, canister, or filter).

* The user is aware of the following: Service Life Information.

Respirators with air-purifying sorbent elements shall be used with caution and with recognition of the wide variability of service lives under differing use conditions. A cartridge’s useful service life is how long it provides adequate protection from harmful

chemicals in the air. The service life of a cartridge depends upon many factors, including:

* + Environmental conditions to include relative humidity through each sorbent element.
  + Breathing rate
  + Cartridge filtering capacity.
  + The make and model of sorbent material.
  + The amount of contaminants in the air.

Classes of respirators offering greater protection can usually be used in place of the minimum acceptable class of respirators. Respirator classes are consistent with respirator certification groupings as specified in 42 C.F.R. Part 84.

Recommendations in the decision logic are based primarily on the physical, chemical, and toxicological properties of the contaminant and on the limitations of each class of respirators, including filtration efficiency, air supply capability, and face seal characteristics and leakage.

* Nonpowered APR are classified into three series—N-, R-, and P-series—according to the efficiency level of the filter(s) as tested according to the requirements of 42 C.F.R. § 84.170 (2012).
  + The N-series filters are restricted to use in those workplaces free of oil aerosols.
  + The R- and P-series filters are intended for removal of any particulate that includes oil-based liquid particulates.
  + N100, R100, and P100 filters demonstrate a minimum efficiency level of 99.97%.
  + N99, R99, and P99 filters demonstrate a minimum efficiency level of 99%.
  + N95, R95, and P95 filters demonstrate a minimum efficiency level of 95%.
* All filters, cartridges, canisters, and/or filters used in the workplace are labeled and color- coded with the NIOSH approval label; that label is not to be removed and must remain legible.
* Canisters, cartridges, and/or filters shall be changed when:
  + The canister, cartridge, and/or filter is exposed to a hazardous environment.
  + The canister, cartridge, and/or filter becomes wet.
  + The user notices increased resistance.
  + The user detects an odor or taste while using the canister, cartridge, and/or filters.
  + The cartridge, canister, and/or filter reaches the manufacturer’s expiration date on the canister, cartridge, and/or filter.

In the absence of any of the aforementioned factors, canisters, cartridges, and/or filters shall be discarded and destroyed no later than five years after the employer’s purchase of the canister, cartridge, and/or filter.

* Negative-pressure respirators shall not be used when facial scars or deformities interfere with the face seal.

Facial deformities, such as scars, deep skin creases, prominent cheekbones, severe acne, and the lack of teeth or dentures, can prevent a respirator from sealing properly.

No respirator (including positive pressure-respirators) shall be used when facial hair interferes with the face seal.

Facial hair that lies along the sealing area of the respirator, such as beards, sideburns, moustaches, or even a few days growth of stubble may interfere with the respirator seal of tight-fitting respirators. These conditions shall be avoided when using tight-fitting respirators. Facial hair between the wearer’s skin and the sealing surfaces of the respirator will prevent an adequate seal. A respirator that permits negative-air pressure inside the facepiece during inhalation may allow leakage and, in the case of positive- pressure devices, will either reduce service time or waste breathing air. An employee shall not enter a contaminated work area when conditions prevent an adequate seal of the respirator facepiece to the face.

* Ordinary eye glasses shall not be used with full-facepiece respirators.

Eye glasses with temple bars or straps that pass between the sealing surface of the full- facepiece and the worker’s face will prevent an adequate seal, and shall not be used.

Special corrective lenses can be mounted inside a full-facepiece respirators and are available from all manufacturers of full-facepiece respirators. To ensure good vision, comfort, and proper sealing of the facepiece, these corrective lenses shall be mounted by an individual designated by the manufacturer as qualified to install accessory items.

* Eye glasses and goggles may interfere with the half facepieces. When interference occurs, a full-facepiece with special corrective lenses shall be provided and worn.
* Several factors may restrict or even prohibit the use of contact lenses while wearing any type of respiratory device. This is especially true of atmosphere-supplying respirators. With full-facepieces, incoming air directed toward the eye can cause discomfort from dirt, lint, or other debris lodging between the contact lens and the pupil.
* Respirators shall be properly maintained, correctly used, and conscientiously worn.
* The usage limitations of air-purifying elements, particularly gas and vapor cartridges, shall not be exceeded.
* Employees are to leave the contaminated area immediately on suspicion of respirator failure and then determine the problem. This includes, but is not limited to, the canister, cartridge, and/or filter becoming wet (a new canister, cartridge, and/or filter is needed), increased resistance, or the user detecting an odor or taste.
* Respirator wearers shall be aware of the variability in human responses to the warning properties of hazardous substances.
* Talking while wearing a respirator equipped with a facepiece may break the seal of the facepiece. When communication is necessary within a contaminated area, it should be done with the help of special communicating equipment obtained from the manufacturer of the respirator.
* Atmospheres IDLH present special considerations. Where the employer cannot identify or reasonably estimate the employee exposure, the employer shall consider the atmosphere to be IDLH.
  + At least one standby person, equipped with proper rescue equipment including an SCBA, shall be preset in the nearest safe area for emergency rescue of those wearing respirators in an IDLH atmosphere. The 2-in, 2-out buddy-system is to be used where resources are present.
  + Communications (visual, voice, signal line, telephone, radio, or other suitable type) shall be maintained among all people present (those in the IDLH atmosphere and the standby people).
* Confined spaces are enclosures that are difficult to get out of, such as storage tanks, tank cars, boilers, sewers, tunnels, pipelines, pits, and tubs. Some enclosed buildings may be treated as confined spaces when IDLH atmospheres occur due to intentional or accidental introduction of hazardous environments.

The atmospheres in a confined space may be IDLH because of toxic air contaminants or lack of oxygen. Before anyone enters a confined space, tests shall be made to determine the presence and concentration of any flammable vapor or gas, or any toxic airborne particulate, vapor, or gas, and to determine the oxygen concentration.

* No one shall enter a confined space if a flammable substance exceeds the LEL. No one shall enter a confined space without wearing the proper type of respirator if any air contaminant exceeds the established PEL or if there is an oxygen deficiency.

If the atmosphere in a confined space is IDLH owing to a high concentration of air contaminant or oxygen deficiency, those who must enter the space shall wear a pressure-demand SCBA or a combination pressure-demand airline and SCBA that always maintains positive-air pressure inside the respiratory inlet covering.

* Low temperatures may fog respirator lenses.

Coating the inner surface of the lens with the antifogging compound normally available from the manufacturer should prevent fogging down to 32°F, but severe fogging may occur below 0°F.

Full facepieces with nose cups that direct the warm, moist, exhaled air through the exhalation valve without its touching the nose are available. They should provide satisfactory vision at as low as -30°F.

At very low temperatures, exhalation valves may freeze due to moisture. Dry respirable air should be used with airline respirators and with the type of SCBA that has an air cylinder when they are used in low temperatures. The minimum temperature that an SCBA should be used and has been tested and approved is listed on the approval label.

* A person working in high-temperature air is under physiological stress. Wearing a respirator causes additional stress that should be minimized by using a light-weight respirator with low-breathing resistance.
* Users must be aware of the signs and symptoms of heat stress, including heat cramps, heat exhaustion, and heat stroke. Heat stroke is a true medical emergency and should not be ignored.
* Use of respirators in conjunction with protective clothing can greatly affect the human response and endurance, especially in hot environments.
* Normally, in hot environments or during heavy work, the body relies a great deal on heat loss through the evaporation of perspiration. With impermeable clothing, the heat loss by water evaporation is not possible.

To reduce the incidence of heat stress, reduce work rate by:

* + Adjusting the work/rest schedules.
  + Using automated procedures and/or mechanical assistance where possible.
  + Minimize the work intensity.

Include periodic fluid/water replacement breaks and consider cooling garments.

* The respirators shall be cleaned and disinfected at the following intervals:
  + Respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition.
  + Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals.
  + Respirators maintained for emergency use shall be cleaned and disinfected after each use.
  + Respirators used in fit testing and training shall be cleaned and disinfected after each use.
* Employees shall store and inspect respirators in compliance with Section 5: Respirator Inspection and Respirator Storage.

Signature of Employee: Date:

Signature of RPPA or Trainer: Date:

### Section 5: Procedures and Schedules for Cleaning, Disinfecting, Storing, Inspecting, Repairing, Discarding, and Otherwise Maintaining Respirators

The employer is required to provide for the cleaning and disinfecting, storage, inspection, and repair of respirators used by employees (Respiratory Protection, 8 CCR 5144(h).

#### Cleaning and Disinfecting

The employer shall provide each respirator user with a respirator that is clean, sanitary, and in good working order (Respiratory Protection, 8 CCR 5144(h). The employer shall ensure that respirators are cleaned and disinfected using the procedures referred to in Respiratory Cleaning Procedures (Mandatory), Appendix B-2 to § 5144 and included in this document in Section 5. Procedures recommended by the respirator manufacturer, provided that such procedures are of equivalent effectiveness, may be substituted.

The respirators shall be cleaned and disinfected at the following intervals:

* + Respirators issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition.
  + Respirators issued to more than one employee shall be cleaned and disinfected before being worn by different individuals.
  + Respirators maintained for emergency use shall be cleaned and disinfected after each use.
  + Respirators used in fit testing and training shall be cleaned and disinfected after each use.

The following steps are to be followed, in order:

1. Remove filters, cartridges, or canisters. Disassemble facepieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
2. Wash components in warm (110°F [43°C] 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.
3. Rinse components thoroughly in clean, warm (110°F [43°C] maximum), preferably running water. Drain.
4. When the cleaner used does not contain a disinfecting agent, respirator components shall be immersed for two minutes in one of the following:
   1. Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter of laundry bleach to one liter of water at 110°F (43°C).
   2. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 millimeters of tincture of iodine (6-8 grams ammonium and/or potassium iodine/100 cc of 45% alcohol) to one liter of water at 110°F (43°C).
   3. 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 (110°F [43°C] maximum) preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration or rubber or corrosion of metal parts if not completely removed.
6. Components shall be hand-dried with a clean, lint-free cloth or air-dried.
7. Reassemble facepiece, replacing filters, cartridges, and canisters where necessary.
8. Test the respirator to ensure that all components work properly.

Source: Respiratory Cleaning Procedures (Mandatory), Appendix B-2 to 8 CCR 5144).

#### Storing

The employer shall ensure that respirators are stored as follows (Respiratory Protection, 8 CCR 5144(h):

* + All respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they shall be packed and stored to prevent deformation of the facepiece and exhalation valve.
  + Emergency respirators shall be kept accessible to the work area.
  + Emergency respirators shall be stored in compartments or in covers that are clearly marked as containing emergency respirators.
  + Respirators shall be stored in accordance with any applicable manufacturer’s instructions.

#### Inspecting

The employer shall ensure that respirators are inspected as follows (Respiratory Protection, 8 CCR 5144 (h):

* + All respirators used in routine situations shall be inspected before each use and during cleaning.
  + All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer’s recommendations, and shall be checked for proper function before and after each use.
  + Emergency escape-only respirators shall be inspected before being carried into the workplace for use.

The employer shall ensure that respirator inspections include:

* + A check of respirator function.
  + A check of tightness of connections.
  + A check of the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters, and/or filters.
  + A check of electrometric parts for pliability and signs of deterioration.
  + SCBA shall be inspected monthly; air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the

manufacturer’s recommended pressure level. The employer shall determine that the regulator and warning devices function properly.

For respirators maintained for emergency use, the employer shall:

* + Certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial attention, and a serial number or other means of identifying the inspected respirator.
  + Provide this above bulleted information on a tag or label attached to the storage compartment of the respirator, is kept with the respirator, or is included in inspection reports stored as paper or electronic files. This information shall be maintained until replaced following a subsequent certification.

A respirator inspection form is included at the end of this section.

#### Repairing, Discarding, and Otherwise Maintaining Respirators

The employer shall ensure that respirators that fail an inspection or are otherwise found to be defective are removed from service, and are discarded or repaired or adjusted in accordance with the following procedures (Respiratory Protection, 8 CCR 5144(h)):

* + Repairs or adjustments to respirators are to be made only by people appropriately trained to perform such operations and shall use only the respirator manufacturer’s NIOSH-approved parts designed for the respirator.
  + Repairs shall be made according to the manufacturer’s recommendations and specifications for the type and extent of repairs to be performed.
  + Reducing the admission values, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

#### Form: Respirator Inspection Record

Respirators are inspected as follows:

* + All respirators used in routine situations shall be inspected before each use and during cleaning.
  + All respirators maintained for use in emergency situations shall be inspected at least monthly and in accordance with the manufacturer’s recommendations, and shall be checked for proper function before and after each use.
  + Emergency escape-only respirators shall be inspected before being carried into the workplace for use.

The respirator inspections shall include:

* + A check of respirator function.
  + A check of tightness of connections.
  + A check of the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters, or filters.
  + A check of electrometric parts for pliability and signs of deterioration.
  + SCBA shall be inspected monthly; air and oxygen cylinders shall be maintained in a fully charged state and shall be recharged when the pressure falls to 90% of the manufacturer’s recommended pressure level. The employer shall determine that the regulator and warning devices function properly.

Type of Respirator: Respirator Number: Respirator Assigned to (individual name or “emergency use”):

List Defects Found

| List of Defects | Is there a Problem Yes or No and explain |
| --- | --- |
| Face Piece |  |
| Inhalation Value |  |
| Exhalation Valve Assembly |  |
| Head Bands |  |
| Cartridge Holder |  |
| Catridge/canister |  |
| Filter |  |
| Harness Assembly |  |
| Hose Assembly |  |
| Speaking Diaphragm |  |
| Gaskets |  |
| Connections |  |

Was this respirator removed from service? Yes No

|  |  |  |
| --- | --- | --- |
| Signature |  | Date |

### Section 6: Procedures to Ensure Adequate Air Quality, Quantity, and Flow of Breathing Air for Atmosphere- Supplying Respirators

The employer is required to provide employees using atmosphere-supplying respirators (SAR and SCBA), with breathing gases of high purity (Respiratory Protection, 8 CCR 5144(i).

The employer shall ensure that compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration accords with the following specifications:

* + Compressed and liquid oxygen shall meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:
    - Oxygen content (v/v) of 19.5-23.5%.
    - Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less.
    - Carbon monoxide (CO) content of 10 ppm or less.
    - Carbon dioxide (CO2) of 1000 ppm or less.
    - Lack of noticeable odor.

The employer shall ensure that compressed oxygen is not used in atmosphere-supplying respirators that have previously used compressed air.

The employer shall ensure that oxygen concentrations greater than 23.5% are used only in equipment designed for oxygen service or distribution.

The employer shall ensure that cylinders used to supply breathing air to respirators meet the following requirements:

* + Cylinders are tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 C.F.R. 173 and 178).
  + Cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air.
  + The moisture content in the cylinder does not exceed a dew pint of –50°F (-45.6°C) at 1 atmosphere pressure.
  + The employer shall ensure that compressors used to supply breathing air to respirators are constructed and situated so as to:
  + Prevent entry of contaminated air into the air-supply system.
  + Minimize moisture content so that the dew point at one atmosphere pressure is 10°F (5.56°C) below the ambient temperature.
  + Have suitable in-line purifying sorbent beds and filters to further ensure breathing air quality. Sorbent beds and filters shall be maintained and replaced or refurbished periodically following the manufacturer’s instructions.
  + Have a tag containing the most recent change date and the signature of the person authorized by the employer to perform the change. The tag shall be maintained at the compressor.

For compressors that are not oil-lubricated, the employer shall ensure that carbon monoxide levels in the breathing air do not exceed 10 ppm.

For oil-lubricated compressors, the employer shall use a high-temperature or carbon monoxide alarm, or both, to monitor carbon monoxide levels. If only high-temperature alarms are used, the air supply shall be monitored at intervals sufficient to prevent carbon monoxide in the breathing air from exceeding 10 ppm.

The employer shall ensure that breathing air couplings are incompatible with outlets for nonrepairable worksite air or other gas systems. No asphyxiating substance shall be introduced into breathing air lines.

The employer shall use breathing gas containers marked in accordance with the NIOSH respirator certification standard, 42 C.F.R. Part 84 (2012).

#### Identification of Filters, Cartridges, and Canisters

All filters, cartridges, canisters, and/or filters used in the workplace shall be labeled and color coded with the NIOSH approval label; that label will not to be removed and must remain legible. ANSI Standard 13.1-67 describes the required color-coding scheme.

|  |  |
| --- | --- |
| Atmospheric contaminants to be protected against | Color assigned |
| Acid gases | White |
| Hydrocyanic acid gas | White with one-half-inch green stripe completely around the canister near the bottom. |
| Chlorine gas | White with one-half-inch yellow stripe completely around the canister near the bottom. |
| Organic vapors | Black |
| Ammonia gas | Green |
| Acid gases and ammonia gases | Green with one-half-inch white stripe completely around the canister near the bottom. |
| Carbon Monoxide | Blue |
| Acid gases and organic vapors | Yellow |
| Hydrocyanic acid gas and chloropicrin vapor | Yellow with one-half-inch blue stripe completely around the canister near the bottom. |
| Acid gases, organic vapors, and ammonia gases | Brown |
| Radioactive materials, excepting tritium and noble gases | Purple (Magenta) |
| Particulates (dusts, fumes, mists, fogs, or smokes) in combination with any of the above gases or vapors | Canister color for contaminant, as designated above, with one-half-inch gray stripe completely around the canister near the top. |
| All of the above atmospheric contaminants | Red with one-half-inch gray stripe completely around the canister near the top. |

### Section 7: Training of Employees in the Respiratory Hazards to Which They Are Potentially Exposed During Routine and Emergency Situations

An analysis of the hazards to which employees are potentially exposed during routine and emergency situations is contained in Section 1: Procedures for Selecting Respirators for Use in the Workplace.

Employees shall employ the Recognize, Avoid, Isolate, and Notify (R.A.I.N.) process with respect to respiratory hazards; R.A.I.N. procedures follow. Training on these procedures shall be comprehensive, understandable, and conducted annually or more frequently if necessary (Respiratory Protection, 29 C.F.R. § 1910.134[k], 2013). Indicators that the employee may require additional training may include that the employee’s competency in this function is questioned by the employee him/herself or the employee’s supervisor, or if work conditions change in a manner that is inconsistent with the R.A.I.N. procedures.

#### Orientation/Training Tool: Recognize, Avoid, Isolate, and Notify

Hazards that emergency service employees are likely to be exposed include irritants (for example, RCA), TIC, contagious and infectious diseases, and WMD. Due to the nature of emergency response work, the employee may approach a hazardous environment without his or her immediate knowledge. *Where the employer cannot identify or reasonably estimate the employee exposure, the employer shall consider the atmosphere to be IDLH*.

Relevant workplace and user factors include exposure to the respiratory hazards listed above. In addition, factors include the following:

* + Outside (open-air) environments.
  + Changing wind condition(s) including direction, speed, temperature.
  + Thermal environmental conditions (heat or cold).
  + Humidity, dew point.
  + Precipitation (rain, snow, ice).
  + Confined space environments; enclosed buildings may be included as confined spaces based on the hazards (known, unknown, or reasonably potential) presented.

Employees shall employ the R.A.I.N. process with respect to respiratory hazards.

### R: Recognize

Recognize respiratory hazards by observing signs and symptoms of victims such as Salivation, Lacrimation, Urination, Defecation, Gastroenteritis, Emesis, Miosis (SLUDGEM), redness or blistering of the skin, and mass casualties or mass fatalities. Other indicators may include injury and/or illness in animals and/or birds.

Recognize potential respiratory hazards by observing package labels, vehicle or container placards, leaking or damaged containers, and/or the presence of containers that may be used as dissemination devices.

Recognize potential respiratory hazards by observing threat levels, verbal or written threats, and abnormal public behavior.

### A: Avoid

Avoid unprotected exposure in areas and situations with known or suspected respiratory hazard releases.

Don appropriate respiratory protection in known or suspected respiratory hazard releases.

Don other appropriate PPE as indicated.

### I: Isolate

Assume a safe distance from the respiratory hazard(s). Ensure a secure perimeter, as feasible, to ensure responder and worker safety, as well as public safety.

Establish control zones—hot, warm, and cold zones.

Perform self-decontamination procedures to remove contaminants.

### N: Notify

Notify immediate supervisor and appropriate chain of communication for other responding units of known or suspected respiratory hazard release.

If you have been injured or exposed, an injury report form may be indicated.

Signature of Employee: Date:

Signature of RPPA or Trainer: Date:

### Section 8: Training of Employees in the Proper Use of Respirators, Including Putting On and Removing Them, Any Limitations in Their Use, and Their Maintenance

The employer is required to provide effective training to employees who are required to use a respirator (Respiratory Protection, 8 CCR 5144(k)). The training must be comprehensive, understandable, and recur at least annually or more often if necessary. The employer is required to provide the basic information on respirators cited in 8 CCR 5144, Appendix D to employees who wear respirators when not required by 8 CCR 5144 or by the employer to do so.

The employer shall ensure that each employee can demonstrate knowledge of at least the following:

* + Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator.
  + What the limitations and capabilities of the respirator are.
  + How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions.
  + How to inspect, put on and remove, use and check the seals of the respirator.
  + What the procedures are for maintenance and storage of the respirator.
  + How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators.
  + The general requirements of 8 CCR 5144.

The training shall be conducted in a manner that is understandable to the employee. The employer shall provide the training prior to requiring the employee to use a respirator in the workplace.

An employer who is able to demonstrate that a new employee has received training within the last 12 months that addresses the elements specified in the aforementioned bullets is not required to repeat such training provided that the employee can demonstrate knowledge of these same elements. Previous training not repeated initially by the employer must be provided no later than 12 months from the date of the previous training.

Retraining shall be administered annually, and when the following situations occur:

* + Changes in the workplace or the type of respirator render previous training obsolete.
  + Inadequacies in the employee’s knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill.
  + Any other situation arises in which retraining appears necessary to ensure safe respirator use.

The basic advisory information on respirators, as presented in 8 CCR 5144 Appendix D, shall be provided by the employer in any written or oral format, to employees who wear respirators, when such use is not required by 8CCR 5144 or by the employer.

A checklist for employee orientation and training on procedures for proper use of respirators in routine and reasonably foreseeable situations is included in Section 4. This checklist shall be completed as part of the procedural training requirements listed above in this section.

Section 4 also includes mandatory procedures for user seal check. These procedures will also become a part of the employee training process. Employees will demonstrate a user seal check to ensure competency. A user seal check must be conducted by each user before each use of the respirator.

### Section 9: Procedures for Regularly Evaluating the Effectiveness of the Program

The employer shall conduct evaluations of the workplace as necessary to ensure that the provisions of the current written respiratory protection program are being effectively implemented and that it continues to be effective (Respiratory Protection, 8 CCR 5144(l)).

The employer shall regularly consult employees required to use respirators to assess the employees’ views on program effectiveness and to identify any problems. Any problems identified during this assessment shall be corrected. Factors to be assessed include, but are not limited to:

* + Respirator fit (including the ability to use the respirator without interfering with effective workplace performance).
  + Appropriate respirator selection for the hazards to which the employee is exposed.
  + Proper respirator use under the workplace conditions the employee encounters.
  + Proper respirator maintenance.

An assessment tool for program evaluation follows.

#### Assessment Tool: Respiratory Protection Program Evaluation Checklist

Generally speaking, the respiratory program should be evaluated for each job/position and at least annually, with program adjustments, as appropriate, made to reflect the evaluation results.

1. Is there a written policy that acknowledges employer responsibility for providing a safe and healthful workplace and assigns program

responsibility, accountability, and authority? .................................................... Yes No

1. Is program responsibility vested in one individual who is knowledgeable

and can coordinate all aspects of the program at the worksite(s)?................... Yes No

1. Can feasible engineering controls or work practices eliminate the need for

respirators? .................................................................................................... Yes No

1. Are there written procedures/statements covering the various aspects of the respiratory protection program, including:

Designation of a respiratory program administrator? ....................................... Yes No Respirator selection?....................................................................................... Yes No

Purchase of NIOSH-certified equipment? ........................................................ Yes No

Medical aspects of respiratory protection program?......................................... Yes No Issuance of equipment? .................................................................................. Yes No

Fitting? ............................................................................................................ Yes No

Training? ......................................................................................................... Yes No Maintenance, storage, and repair? .................................................................. Yes No Inspection?...................................................................................................... Yes No

Use under special conditions? ......................................................................... Yes No

Evaluation of the hazardous conditions the respirator user will likely face? ..... Yes No

1. Are work area conditions and worker exposures properly surveyed? .............. Yes No Can environmental controls be put into place to avoid exposure to the

hazards? ......................................................................................................... Yes No

Has an evaluation of the hazards the employee will likely face been

conducted? ..................................................................................................... Yes No

1. Are respirators selected on the basis of the hazards to which the

employee is exposed or has risk of exposure? ............................................... Yes No

1. Are selections of respirators made by individuals knowledgeable in proper

selection procedures? ..................................................................................... Yes No

1. Are only certified respirators purchased and used? ......................................... Yes No Do they provide adequate protection for the specific hazard and

concentration of the contaminant? .................................................................. Yes No

1. Has a medical evaluation of the prospective user been made through the medical questionnaire and review process to determine physical and psychological ability to wear the selected respiratory protective

equipment? .................................................................................................... Yes No

1. Where practical, have respirators been issued to the users for their

exclusive use?................................................................................................. Yes No

Are there records covering issuance? ............................................................. Yes No

1. Respiratory protective equipment fitting:

Are the users given the opportunity to try on several respiratorsto determine whether the respirator they will subsequently be wearing is the

best fitting one? .............................................................................................. Yes No

Is the respirator fit tested at appropriate intervals? ......................................... Yes No Are those users who require corrective lenses properly fitted? ....................... Yes No Is the facepiece-to-face seal tested in a test atmosphere (fit tested)? ............. Yes No Are workers prohibited from wearing respirators in contaminated work

areas when they have facial hair or other characteristics that may cause

face seal leakage? .......................................................................................... Yes No

1. Respirator use in the work area.

Are respirators being worn correctly? .............................................................. Yes No Are workers keeping respirators at all times while in the hazardous work

area? ............................................................................................................... Yes No

1. Maintenance of respiratory protective equipment. Cleaning and Disinfecting.

Are respirators cleaned and disinfected after each use when different

people use the same device? .......................................................................... Yes No

Are respirators cleaned and disinfected as frequently as necessary for

devices issued to individual users?.................................................................. Yes No Are proper methods of cleaning and disinfecting utilized? ............................... Yes No

##### Storing

Are respirators stored in a manner so as to protect them from dust,

sunlight, heat, excessive cold or moisture, or damaging chemicals? ............ Yes No Are respirators stored properly in a storage facility to prevent them from

deforming? ..................................................................................................... Yes No

Is storage in lockers or other storage locations permitted only if the

respirator is in a carrying case or carton? ....................................................... Yes No

##### Inspecting

Are respirators inspected before and after each used and during

cleaning?......................................................................................................... Yes No

Are qualified individuals/users instructed in inspection techniques? ................ Yes No Is respiratory protective equipment designated as “emergency use”

inspected at least monthly (in addition to after each use)?............................... Yes No Are SCBA incorporating breathing gas containers inspected weekly for

breathing gas pressure? .................................................................................. Yes No

Is a record kept of the inspection of “emergency use” respiratory

protective equipment? ................................................................................... Yes No

##### Repairing

Are replacement parts used in repairing those of the manufacturer of the

respirator? ...................................................................................................... Yes No

Are repairs made by manufacturers or manufacturer-trained individuals? ...... Yes No

1. Special use conditions.

Is a procedure developed for respiratory protective equipment usage in

atmospheres IDLH? ........................................................................................ Yes No

Is a procedure developed for equipment usage for entry into confined

space? ............................................................................................................ Yes No

1. Training

Are users trained in proper respirator use, cleaning, and inspection? ............. Yes No Are users trained in the basis for selection of respirators? .............................. Yes No Are users evaluated, using competency-based evaluation, before and

after training? ................................................................................................. Yes No

# Appendix A: Form: Appointment of a Respiratory Program Administrator

Benjamin Virzi (name) has been appointed as the Respiratory Protection Program Administrator (RPPA) for

California State University, San Bernardino (organization).

This appointment has been made by Teresa Fricke, the Director of Environmental Health and Safety of the organization. This appointment was made effective on the 11 (date) June(month) 20 19(year). This appointment shall remain in effect until revoked by the Director of Environmental Health and Safety. Appointment of a new RPPA shall be considered revocation of this stated appointment.

The RPPA is responsible for and carries authority to implement all facets of the organization’s respiratory protection program as specified in 29 C.F.R. § 1910.134 and other regulations as applicable.

The RPPA will develop detailed written standard operating procedures in compliance with the Respiratory Protection Program.

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

Signature of EHS director and date

# Appendix B: Form: Voluntary use of a Filtering Face Piece (dust Mask) where Respirator Use is not Required

Please read the following information provided in compliance with the Respiratory Protection Standard for employees who voluntarily choose to use a filtering face piece (dust mask). If you have any questions about the standard or wish any other information you may contact the Environmental Health and Safety Department at extension 75179.

Appendix D to Sec. 1910.134 (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 respirator’s 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.

I choose to voluntarily use a filtering facepiece (dust mask) and have received a copy of Appendix D to §1910.134. I understand that this is the only type of respirator I may use without contacting the EHS Department and being enrolled in the Respiratory Protection Program. If I experience any difficulties while wearing the filtering facepiece I am to immediately cease wearing the filtering facepiece and contact the EHS Department.

Signature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Print Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Dept. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Phone number \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# Appendix C: Form: Respirator Issuing Record

|  |  |  |
| --- | --- | --- |
| **Employee Name** | **Respirator Issued** | **Date Issued (Month/Day/Year)** |
|  | Manufacturer: Model: Serial Number:  Size: |  |
|  | Manufacturer: Model: Serial Number:  Size: |  |
|  | Manufacturer: Model:  Serial Number: Size: |  |
|  | Manufacturer: Model: Serial Number:  Size: |  |
|  | Manufacturer: Model:  Serial Number: Size: |  |
|  | Manufacturer: Model: Serial Number:  Size: |  |
|  | Manufacturer: Model:  Serial Number: Size: |  |

# Appendix D: Form: Supplemental Information for the PLHCP for Review of Medical Questionnaire (to be supplied by the employer)

| Employee Name | Type of Respirator to be Used  (Circle Those Appropriate) | Duration and Frequency of Use of Respirator | Expected Physical Work Effort During Respirator Use (Circle as Appropriate) | Additional PPE to be Worn While Using Respirator | Temperature, Humidity Extremes Encountered During Respirator Use |
| --- | --- | --- | --- | --- | --- |
|  | SCBA |  | High  Medium  Low |  |  |
| PAPR |
| APR (Full) |
| APR (Half) |
| Dust Mask |
|  | SCBA |  | High  Medium  Low |  |  |
| PAPR |
| APR (Full) |
| APR (Half) |
| Dust Mask |
|  | SCBA |  | High  Medium  Low |  |  |
| PAPR |
| APR (Full) |
| APR (Half) |
| Dust Mask |
|  | SCBA |  | High  Medium  Low |  |  |
| PAPR |
| APR (Full) |
| APR (Half) |
| Dust Mask |
|  | SCBA |  | High  Medium  Low |  |  |
| PAPR |
| APR (Full) |
| APR (Half) |
| Dust Mask |

# Appendix E: Form: Record of Fit Test

Employee Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| **Fit Test** | **Type of Fit Test** | **Results of Fit Test** | **Respirator Fit Tested** |
| Date: |  | Pass yes no | Manufacturer: |
| Reason: | Fit Factor: | Model: |
|  | Conducted by: | Serial Number: |
|  |  | Size: |
| Date: |  | Pass yes no | Manufacturer: |
| Reason | Fit Factor: | Model: |
|  | Conducted by: | Serial Number: |
|  |  | Size: |
| Date: |  | Pass yes no | Manufacturer: |
| Reason: | Fit Factor: | Model: |
|  | Conducted by: | Serial Number: |
|  |  | Size: |
| Date: |  | Pass yes no | Manufacturer: |
| Reason: | Fit Factor: | Model: |
|  | Conducted by: | Serial Number: |
|  |  | Size: |
| Date: |  | Pass yes no | Manufacturer: |
| Reason: | Fit Factor: | Model: |
|  | Conducted by: | Serial Number: |
|  |  | Size: |
| Date: |  | Pass yes no | Manufacturer: |
| Reason: | Fit Factor: | Model: |
|  | Conducted by: | Serial Number: |
|  |  | Size: |
| Date: |  | Pass yes no | Manufacturer: |
| Reason: | Fit Factor: | Model: |
|  | Conducted by: | Serial Number: |
|  |  | Size: |