



Respiratory Protection Program

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I. Purpose

The purpose of this plan is to establish a program and procedures for respiratory protection in the Plant Operations department of the University of Utah. This program supports compliance with the Occupational Safety and Health Administration Respiratory Protection standard, 29 CFR 1910.134.

This program describes the use of air-purifying respirators and procedures for identifying airborne hazards, selecting and using proper respirators, medical evaluations of employees and fit testing of respirators, and training and record keeping requirements.

The program outlines the policy and procedures necessary to implement a Respiratory Protection program. Instructions and procedures specific to each work area are located in the Worksite Specific Procedures.

II. Scope

This program applies to all employees who are required to wear air-purifying respirators to prevent exposure to airborne contaminants. It also applies to employees who voluntarily wear respirators although respirators are not required.

This program does not cover the use of atmosphere supplying respirators in oxygen deficient atmospheres, high concentration atmospheres, or unknown atmospheres.

III. Definitions

Administrative Controls: administrative changes in work schedules or procedures that

reduce employee exposure to respiratory hazards.

APR: Air purifying respirator. A respirator with an air purifying filter cartridge or canister that removes specific air contaminants by passing ambient air through the air purifying element.

Atmosphere supplying respirator: A respirator that supplies the wearer with breathing air from a source independent of the ambient air, including supplied air respirators (SAR) and self contained breathing apparatus (SCBA).

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

Contaminants: substances in the air that can cause immediate (acute) or long term (chronic) health problems.

Concentration: the amount of contaminant in the air, measured in parts per million (ppm) or milligrams per cubic meter (mg/m³).

Demand respirator: means an atmosphere supplying respirator that admits breathing air to the face piece only when a negative pressure is created inside the face piece by inhalation.

Dusts: are fine particles that are created when solid material breaks down. Operations that typically create dust are grinding, crushing, drilling, sanding and milling.

Dust Masks (Filtering Face pieces): a negative pressure particulate respirator with a filter as an integral part of the face piece, or with the entire face piece composed of the filtering medium.

Emergency situation: means any occurrence such as, but not limited to, equipment failure,

rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.

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

End of Service Life Indicator (ESLI): a system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.

Engineering Controls: specialized equipment, processes or practices that can reduce employee exposure to respiratory hazards.

Escape only respirator: A respirator intended for emergency exit use only.

Exposure: coming into contact with a hazardous substance through inhalation, ingestion, skin contact or absorption.

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

Fit test: means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual.

Fumes: are created when solid materials vaporize under extreme heat. As the vapor cools it condenses into an extremely small particle, e.g., fumes are created during welding and cutting of steel.

Gases: Materials which, like air, have the ability to diffuse and spread throughout an enclosure or area. Examples of gases are nitrogen, carbon monoxide and carbon dioxide.

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

Immediately Dangerous to Life and health (IDLH): an OSHA classification for atmospheres that are immediately fatal. It includes oxygen deficient atmospheres and unknown atmospheres.

Loose fitting face piece: a respirator with an inlet covering that is designed to form a partial seal with the face.

Mists: are created when liquids are atomized and condensed. Typical sources of mists are spraying operations, mixing and cleaning operations.

MSDS: Material Safety Data Sheet. Written or printed material from the product manufacturer which has information about the hazards of a material.

MUL: Maximum Use Limit. The maximum amount of protection provided by a respirator. MUL is calculated by multiplying the respirators protection factor by the Permissible Exposure Level (PEL) for the contaminant.

Negative Pressure Respirator: a tight fitting respirator in which the air pressure inside the face piece is negative during inhalation with respect to the ambient air outside the respirator.

NIOSH: National Institute for Occupational Safety and Health. A federal agency which establishes minimum performance standards for respirators and approves respirators for various uses.

Oxygen Deficiency: too little oxygen in the air, which can result in illness or injury to

employees. By OSHA definition, it is an oxygen level less than 19.5%.

Powered Air-Purifying Respirator (PAPR): A respirator that uses a blower to force ambient air through air purifying elements to the inlet covering.

PEL: Permissible Exposure Level. Established by OSHA, PELs are the maximum allowable concentrations of substances in the air that an employee can be exposed to without harmful effects during an 8-hour period.

PLHCP: Physician or other licensed health care professional, whose legally permitted scope of practice allows him or her to independently provide or be delegated the responsibility to provide some or all of the health care services required by this program.

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

PPE: Personal Protective Equipment. Any equipment used to protect an employee from danger, including hard hats, boots, gloves, hoods, goggles, and respirators.

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

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

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

Self Contained Breathing Apparatus (SCBA): means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

Supplied air respirator (SAR): means an atmosphere supplying respirator for which the source of breathing air is not designed to be carried by the user. (E.g., an airline respirator).

Tight fitting face piece: a respirator with an inlet covering that forms a complete seal with the face.

TLV: Threshold Limit Value. Exposure guidelines established by American Council of Governmental Industrial Hygienists (ACGIH) which have been established for airborne concentrations of many chemical compounds.

Time Weighted Average (TWA): A weighted average exposure level over a given amount of time, usually 8 hours.

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

Vapors: are formed through the evaporation of liquids or solids. Examples include gasoline, paint thinners, and solvents.

IV. Responsibilities

The President of the University has ultimate responsibility for establishing and maintaining the health and safety programs for the University.

University Administration including Vice Presidents, Deans, Department Heads, etc.

- Ensuring individuals under their management have the authority and support to implement a Respiratory Protection program.

- Ensuring areas under their management are in compliance with the OSHA Respiratory Protection Standard.
- Committing resources required to ensure respiratory protection and regulatory compliance.
- Establishing methods for dissemination of respiratory protection information.
- Establishing methods for implementing a respiratory protection program.
- Establishing an accountability system for respiratory protection program compliance.
- Naming a program administrator qualified to supervise the respiratory protection program and who will maintain records of training, medical evaluations and fit testing.

The Program Administrator from Occupational and Environmental Health and Safety is responsible for:

- Administering this program and assuring it satisfies applicable requirements.
- Conducting hazard assessments of areas where respiratory hazards may be present.
- Assisting in the selection of appropriate respirators.
- Funding medical evaluations and fit tests for employees who wear respirators.
- Coordinating initial training on respirator use.
- Assisting with the coordination medical evaluations and fit tests.
- Assisting the departmental program administrator with all recordkeeping requirements as needed.
- Auditing the program for continued effectiveness.

The Departmental Program Administrator(s) or Principle Investigator is (are) responsible for:

- Maintaining a current and complete list of approved respirator wearers, including dates of training, medical evaluations, fit tests, and the types of respirators which

have been approved for use.

- Maintaining a written Respiratory Protection Program and Worksite Specific Procedures with instructions for each work area requiring respiratory protection.
- Purchasing and providing approved respirators and replacement cartridges.
- Scheduling medical exams
- Scheduling training through Environmental Health and Safety.

The Lab/Shop/Area Supervisor is responsible for:

- Knowing the hazards in their areas that require respiratory protection.
- Knowing the types of respirators that need to be used.
- Ensuring the respirator program and worksite specific procedures are followed.
- Enforcing the wearing of respirators where it is required.
- Ensuring that employees receive training and medical evaluations when necessary.
- Coordinating annual re-training.
- Notifying Environmental Health and Safety of any problems with respirator use, or any changes in work processes that would impact airborne contaminant levels.

The Employee who wears a respirator is responsible for:

- Participating in all training.
- Wearing the respirator in accordance with the program policies and worksite specific procedures.
- Properly maintaining their respiratory protection equipment.
- Reporting any malfunctions or concerns to their supervisor.

V. Program Elements

1. Identification of Airborne Contaminants

A. Types of Contaminants

- There are two main types of respiratory hazards: oxygen deficiency and airborne contaminants. This program covers only airborne contaminants.
- The main types of airborne contaminants are:
 - *Dusts*: particles, released during work operations such as grinding and sawing.
 - *Mists*: particles of liquid, released during operations such as spray painting.
 - *Vapors*: gaseous forms of a liquid, such as paint solvents.
 - *Fumes*: vaporized condensed metals, as present in welding operations.
 - *Gases*: such as nitrogen, methane, carbon monoxide.

B. Workplace Evaluations/Hazard Assessments

- Environmental Health and Safety must evaluate each workplace for possible airborne contaminants. A hazard assessment will be conducted in workplaces with the possibility of over exposure.
- Once a respiratory hazard has been identified, the work area must be monitored for any changes in concentration level or for new hazards. Changes in work processes, substitution of materials, or changes in the ventilation of an area may necessitate re-testing. Supervisors are responsible for monitoring day-to-day operations and reporting changes to Environmental Health and Safety.

2. Selecting Proper Respiratory Protection

A. Controlling airborne hazards

- When controlling airborne hazards, engineering and administrative controls will first be considered as a means to reduce the hazards. Engineering controls can include

enclosure, substitution, process modification, and ventilation. Administrative controls include scheduling changes to reduce time spent in contaminated areas.

B. Required Use of Respirators

- In situations where engineering and administrative controls do not sufficiently reduce exposure to levels below Permissible Exposure Levels (PEL), respirators are required.

C. Selection of Respirators

- Only NIOSH approved respirators will be used.
- Single strap disposable comfort masks are not approved respirators.
- Respirators will be selected based on the respiratory hazards to which the employee is exposed, and the workplace and user factors that affect performance.
- An employee shall wear only a respirator which has been fit tested and approved for the employee and the hazards of the exposure.
- Respirator types, models, sizes, and cartridges are not interchangeable.
- The following factors are to be considered when determining the proper respiratory protection:
 1. Employee exposure (e.g., concentration, route of exposure).
 2. Physical form and chemical state of the contaminant.
- If the employee exposure cannot be identified or estimated, then the atmosphere must be considered IDLH.

- For protection against **particulates**, one of the following respirators shall be provided:
 1. An atmosphere supplying respirator or
 2. An air purifying respirator equipped with a filter certified by NIOSH as a HEPA (High Efficiency Particulate Air) filter or
 3. An air purifying respirator equipped with a filter certified for particulates by NIOSH or
 4. For contaminants consisting primarily of particulates with a mass median aerodynamic diameter (MMAD) of at least 2 micrometers, an air-purifying respirator with any filter certified for particulates by NIOSH.

- For protection against **gases and vapors**, one of following respirators shall be provided:
 1. An atmosphere supplying respirator or
 2. An air purifying respirator that is either equipped with a chemical cartridge that has an end of service life indicator (ESLI) certified by NIOSH for the contaminant, OR if there is no appropriate ESLI, then a replacement schedule must be in place for cartridges and filters based on information that will assure the cartridges are changed before their end of service life. The replacement schedule must be included in the worksite specific instructions. OEHS will assist in determining the cartridge change schedule.

- Consult Appendix A-1 for a description of Respirator Types and Appendix A-2 for Selection Guidelines.

D. Voluntary Use of Respirators

- Employees will be allowed to use respirators voluntarily if the respirator itself will not create a hazard.
- Employees whose only use of a respirator is the voluntary use of a dust mask

(filtering face piece) are not subject to the requirements of the written program.

- Employees voluntarily wearing respirators other than dust masks are subject to the requirements of this program, including medical evaluations, training, and maintenance procedures.
- Fit tests are not required for voluntary users, but are encouraged.
- All employees voluntarily wearing respirators will be provided a copy of the information contained in Appendix B - Information for Employees Using Respirators When Not Required Under the Standard.

3. Maintenance and Care of Respirators

A. Cleaning and Disinfecting

- Each employee shall be provided with a respirator that is clean, sanitary and in good working order.
- Respirators shall be cleaned and disinfected using the procedures in Appendix C or procedures recommended by the manufacturer if they are equally effective.
- The frequency for cleaning and disinfecting is as follows:
 - Respirators used by only one employee shall be cleaned and disinfected as often as necessary to be maintained in a sanitary condition.
 - Shared respirators must be cleaned and disinfected prior to use.
 - Emergency use respirators must be cleaned and disinfected after each use.
 - Respirators used in fit tests and training exercises must be cleaned and disinfected after use.

B. Storage

- Respirators shall be stored so as to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture and damaging chemicals.
- Respirators shall be stored in such a manner as to prevent deformation of the face

piece and valves.

- Emergency use respirators shall be kept accessible to the work area, in compartments or covers that are clearly marked as containing emergency respirators, and stored in accordance with the manufacturer's instructions.

C. Inspection

- Respirators used in routine situations shall be inspected before each use and during cleaning.
- A respirator inspection includes the following:
 - A check of respirator function, tightness of connections, and the condition of the various parts, including the face piece, head straps, valves, connecting tubes, cartridges, canisters and filters.
 - A check of the elastic parts for pliability or deterioration.
- Emergency use respirators shall be inspected at least monthly, and in accordance with the manufacturer's instructions.
 - Emergency use respirators shall also be checked for proper function before and after each use.

D. Repairs

- Respirators that fail inspections or are otherwise found to be defective shall be removed from service and discarded, repaired, or adjusted by appropriately trained persons, with NIOSH approved parts, according to manufacturer's specifications.
 - Valves, regulators and alarms shall be adjusted or repaired only by the manufacturer or manufacturer's technicians.

E. Identification of Filters, Cartridges and Canisters

- Filters, cartridges and canisters must be labeled and color-coded with the NIOSH

approval label. The label is not to be removed and must remain legible.

4. Limitations of Air Purifying Respirators

A. IDLH Atmospheres

- Air purifying respirators shall not be used in oxygen deficient atmospheres, IDLH atmospheres, or unknown atmospheres. All confined spaces shall be considered IDLH unless proven otherwise. If assistance is required to determine an unknown atmosphere, contact Environmental Health and Safety.

B. Respirator Types

- Respirator types, models, and sizes are not interchangeable. An employee shall only wear a respirator which has been fit tested and approved for the employee's use.

C. Cartridges and Filters

- Cartridges and filters are specific to certain hazards. Use the cartridge approved for the task. Do not interchange manufacturer's cartridges or filters.

D. Concentration

- There are limits to the concentration levels that can be used with half mask and full-face respirators. Consult the cartridge's Maximum Upper Limit and Environmental Health and Safety to determine if you have the proper level of protection.

E. Face Seal Protection

- Anything that breaks the seal of a respirator will reduce its effectiveness. Facial hair, temple bars of glasses and head coverings are not to be worn.
 - Corrective lenses can be fitted inside a full-face respirator with a special insert kit.

5. Medical Evaluations

A. Initial Evaluations

- Every employee must be medically evaluated prior to fit testing and initial use of a respirator.
- Medical evaluations shall be conducted by a physician or other licensed health care professional (PLHCP).
- The recommended PLHCP is the Occupational Medicine Clinic at the Redwood Health Center. [1525 W. 2100 S. SLC (801)213-9777]
- Medical evaluations shall consist of either a medical questionnaire or an initial medical examination that obtains the same information as the questionnaire.
- The requirements of the questionnaire are mandatory. (Appendix D).
- Medical questionnaires and examinations shall be administered confidentially and during normal working hours.

B. Follow-up Medical Examinations

- Follow-up medical examinations are necessary if an employee gives a positive response to any of the questions numbered 1 through 8 in section 2 of the questionnaire.
 - The follow-up medical examination shall include any medical tests,

consultations or diagnostic procedures that the PLHCP deems necessary to make a final determination.

C. Supplemental Information for the PLHCP.

- The following information must be supplied to the PLHCP before a recommendation is made:
 - Type and weight of the respirator to be used.
 - Duration and frequency of use.
 - Expected physical effort.
 - Additional protective clothing and equipment to be worn.
 - Temperature and humidity that may be encountered.
 - A copy of the written program and the regulation.

D. Medical Determination

- The OEHS Program Administrator must obtain a written recommendation from the PLHCP on whether or not the employee is medically able to use the respirator.
- The recommendation shall include only the following information:
 - Any limitations on respirator use related to the medical condition of the employee or workplace conditions including whether the employee is medically able to wear the respirator.
 - The need, if any, for a follow-up medical examination.
 - A statement that the PLHCP has provided the employee with a copy of the recommendation.
- If the PLHCP finds an employee cannot use a negative pressure respirator, a PAPR will be provided, if suitable.

E. Additional Medical Evaluations

- Additional medical evaluations shall be provided if:
- An employee reports medical signs or symptoms related to the ability to use a respirator.
- A PLHCP, supervisor, or the program administrator deems an employee needs re-evaluation.
- Information from the program, observations during fit tests, or evaluations indicate the need for re-evaluation.
- Changes in the workplace conditions result in increased physiological burden on the employee.

F. Employee Access

- The employee shall receive a copy of the PLHCP's recommendation.
- The employee shall have an opportunity to discuss the questionnaire and examination with the PLHCP.

6. Fit testing

A. Initial Fit Tests

- Before wearing a respirator, employees are required to be fit tested with the same make, model, style and size of respirator that will be used.
- A sufficient number of respirator models and sizes shall be available so that the respirator is acceptable to and correctly fits the user.
- Employees shall wear only respirators which have been fit tested and approved for use.

B. Fit Test Procedures

- Fit tests are either qualitative or quantitative, depending on the respirator type and use, and must follow the procedures outlined in the OSHA standard 1910.134, Appendix A.
- Qualified fit-test technicians shall perform fit-tests.
- The recommended fit test providers are Environmental Health & Safety.

C. Frequency

- Fit testing shall be conducted initially, annually, and whenever changes in an employee's physical condition could affect respirator fit, and whenever requested by the employee because the fit is unacceptable.

D. Records

- Records of fit testing must be maintained by the Departmental Program Administrator and shall include:
 - The name of the employee tested.
 - The type of test conducted.
 - The date of the test.
 - The identity of the tester.
 - The make, model, style and size of respirator fitted.
 - The test results.

7. Face Seal Protection

A. Prohibitions

- Tight fitting face pieces are not to be worn by employees:
 - Who have any facial hair that comes between the sealing surface and the

face, or that interferes with valve function.

- Who have any condition that interferes with the seal, such as missing dentures, jewelry, or headgear.
- If corrective glasses, goggles or other PPE interfere with the seal.

B. User Seal Checks

- Employees must perform a user seal check each time they put on the respirator according to the procedures in Appendix E.

C. Continued Respirator Effectiveness

- The supervisor and Departmental Program Administrator shall maintain appropriate surveillance of the work area and employee exposure. Respirator effectiveness must be re-evaluated when there is a change in work area conditions or degree of employee exposure or stress.

D. Leaving the Respirator Work Area

- Employees must be allowed to leave the respirator use area:
 - To wash their faces and respirators as necessary to prevent eye or skin irritation.
 - If they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the face piece.
 - To replace the respirator or the filter cartridges or canisters.
- A defective respirator must be replaced or repaired before returning to the work area.

8. Training and Information

A. For Required Users of Respirators

- All employees who are required to wear respirators must receive initial training in their use and maintenance.
- Employees must be trained sufficiently to demonstrate:
 - A knowledge of why the respirator is required.
 - How improper fit, usage or maintenance can compromise the protectiveness of the respirator.
 - The limitations and capabilities of the respirator.
 - How to deal with emergencies or malfunctions.
 - How to inspect, don and remove, and check the seal of the respirator.
 - Maintenance and storage procedures.
 - Medical symptoms and signs that may limit or prevent the effective use of respirators (in Appendix D).
 - General requirements of OSHA's respiratory protection standard (29CFR 1910.134).
- Qualified persons who are familiar with the regulatory requirements of the Respiratory Protection Standard and trained in respirator use and fit test procedures shall provide any required training.
- The recommended trainer is Environmental Health and Safety.

B. For Voluntary Users of Respirators

- Employees voluntarily wearing a respirator shall be provided the information in Appendix B.

C. Frequency of Re-Training

- Re-training will be provided annually and whenever the following occur:
- Changes in the workplace or type of respirator used.
- Inadequacies in the employee's knowledge or use of the respirator are apparent.
- Any other situation in which re-training is necessary to ensure safe respirator use.

9. Record-keeping

- Records of training and fit testing shall be kept by the Program Administrator for the duration of the wearer's employment.
- Records of medical evaluations shall be kept for the duration of the wearer's employment and 30 years following.

10. Program Evaluation

- The Program Administrator(s) shall conduct evaluations of the workplace as necessary, and at least annually, to ensure the provisions of this written program are being effectively implemented.
- The program evaluation shall include consulting with employees required to wear respirators to assess the employee's views on program effectiveness and to identify any problems. Any problems identified shall be corrected.
- Factors to be assessed include respirator fit, appropriate respirator selection, proper use, and maintenance.

VI. Summary of Program Requirements:

Element	Frequency	Documentation	Responsibility
Hazard Assessment	*Initially *Whenever work processes	Written hazard assessment	Program Administrators

	change		
Cleaning and Disinfecting	*Respirators used by one employee must be cleaned as often as necessary	None	Employee
	*Shared respirators must be cleaned prior to use	None	Employee
	* Emergency respirators must be cleaned after each use	None	Employee
User seal check	*Each time a respirator is put on	None	Employee
Inspections	*Respirators must be inspected before each use and during cleaning	None	Employee
	*Emergency respirators must be inspected monthly	A record of inspections	Supervisor
Medical Evaluations	*Initially	Records kept	Program Administrators
	*As necessary		
Fit testing	*Initially	Records kept	Program Administrators
	*Annually		
	*As necessary		
Training	*Initially	Records kept	Program Administrators
	*Annually		
	*As necessary		
Program Evaluation	*As necessary (at least annually)	Written evaluation	Program Administrators

Appendix A-1 Respirator Types

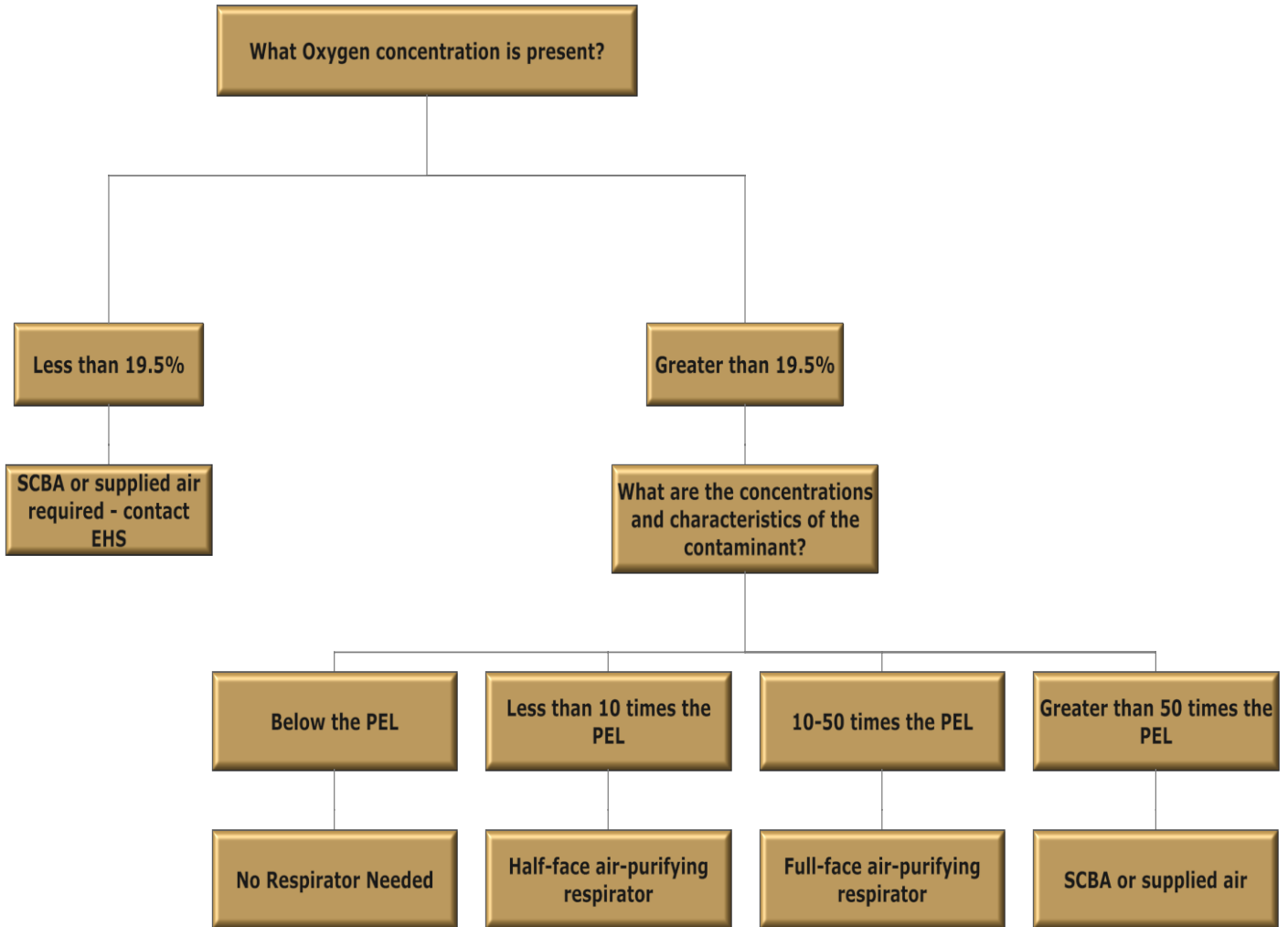
Appendix A-1: Respirator Types

Type	Capabilities	Fit Test	Limitations
Air Purifying, Chemical Cartridge, Half-face	Chemical Specific Cartridge APF=10	Qualitative	Not for use in atmospheres with concentrations above 10 times the PEL. Not for use for any chemical not listed on the cartridge, IDLH or unknown atmospheres.
Air Purifying, Chemical Cartridge, Full-face	Chemical Specific Cartridge APF=50	Qualitative or quantitative	Qualitative fit testing is not approved for respirator use in atmospheres above 10 times the PEL. Not for use for any chemical not listed on the cartridge, IDLH or unknown atmospheres.
Powered Air Purifying, Chemical Cartridge, Full-face	Chemical Specific Cartridge APF=50	Qualitative or quantitative	Not for use for any chemical not listed on the cartridge, IDLH or unknown atmospheres.

Reference: NIOSH Respirator Decision Logic
APF=assigned protection factor

Appendix A-2
Respirator Selection Guide

Appendix A-2 Respirator Selection Guide



Appendix B
Information for Employees Using Respirators when Not Required

Information for Employees Using Respirators when Not Required

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.

Appendix C

Cleaning Procedures

Respirator Cleaning Procedures

- Remove filters, cartridges, or canisters. Disassemble face pieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
- Wash components in warm (43 deg. C [110 deg. F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.
- Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain.
- Disinfect components. When the cleaner used does not contain a disinfecting agent, respirator components should 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 43 deg. C (110 deg. F); or,
 2. Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of water at 43 deg. C (110 deg. F); or,
 3. Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
- Rinse components thoroughly in clean, warm (43 deg. C [110 deg. F] maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on face pieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
- Dry components. Components should be hand-dried with a clean lint-free cloth or air-dried.

- Reassemble face piece, replacing filters, cartridges, and canisters where necessary.
- Test the respirator to ensure that all components work properly.

Appendix D

OSHA Respirator Medical Evaluation Questionnaire

OSHA Respirator Medical Evaluation Questionnaire

To the employer:

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

To the employee:

- Can you read (circle one): Yes/No
- Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Part A

Section 1 (Mandatory)

The following information must be provided by every employee who has been selected to use any type of respirator.

(please print)

1. Today's date:-----

2. Your name:-----

3. Your age (to nearest year):-----

4. Sex (circle one): Male/Female

5. Your height: _____ ft. _____ in.

6. Your weight: _____ lbs.

7. Your job title:-----

8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code):_____

9. The best time to phone you at this number: _____

10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No

11. Check the type of respirator you will use (you can check more than one category):

a. _____ N, R, or P disposable respirator (filter-mask, non-cartridge type only).

b. _____ Other type (for example, half- or full-face piece type, powered-air purifying, supplied-air, self-contained breathing apparatus).

12. Have you worn a respirator (circle one): Yes/No

If ``yes," what

type(s):-----

Part A

Section 2 (Mandatory)

Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please circle "yes" or "no").

1. Do you currently smoke tobacco, or have you smoked tobacco in the last month: Yes/No

2. Have you ever had any of the following conditions?

- a. Seizures (fits): Yes/No
- b. Diabetes (sugar disease): Yes/No
- c. Allergic reactions that interfere with your breathing: Yes/No
- d. Claustrophobia (fear of closed-in places): Yes/No
- e. Trouble smelling odors: Yes/No

3. Have you ever had any of the following pulmonary or lung problems?

- a. Asbestosis: Yes/No
- b. Asthma: Yes/No
- c. Chronic bronchitis: Yes/No
- d. Emphysema: Yes/No
- e. Pneumonia: Yes/No
- f. Tuberculosis: Yes/No
- g. Silicosis: Yes/No
- h. Pneumothorax (collapsed lung): Yes/No
- i. Lung cancer: Yes/No
- j. Broken ribs: Yes/No
- k. Any chest injuries or surgeries: Yes/No
- l. Any other lung problem that you've been told about: Yes/No

4. Do you currently have any of the following symptoms of pulmonary or lung illness?
- a. Shortness of breath: Yes/No
 - b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline:
Yes/No
 - c. Shortness of breath when walking with other people at an ordinary pace on level ground:
Yes/No
 - d. Have to stop for breath when walking at your own pace on level ground: Yes/No
 - e. Shortness of breath when washing or dressing yourself: Yes/No
 - f. Shortness of breath that interferes with your job: Yes/No
 - g. Coughing that produces phlegm (thick sputum): Yes/No
 - h. Coughing that wakes you early in the morning: Yes/No
 - i. Coughing that occurs mostly when you are lying down: Yes/No
 - j. Coughing up blood in the last month: Yes/No
 - k. Wheezing: Yes/No
 - l. Wheezing that interferes with your job: Yes/No
 - m. Chest pain when you breathe deeply: Yes/No
 - n. Any other symptoms that you think may be related to lung problems: Yes/No
5. Have you ever had any of the following cardiovascular or heart problems?
- a. Heart attack: Yes/No
 - b. Stroke: Yes/No
 - c. Angina: Yes/No
 - d. Heart failure: Yes/No
 - e. Swelling in your legs or feet (not caused by walking): Yes/No
 - f. Heart arrhythmia (heart beating irregularly): Yes/No
 - g. High blood pressure: Yes/No
 - h. Any other heart problem that you've been told about: Yes/No
6. Have you ever had any of the following cardiovascular or heart symptoms?
- a. Frequent pain or tightness in your chest: Yes/No

- b. Pain or tightness in your chest during physical activity: Yes/No
- c. Pain or tightness in your chest that interferes with your job: Yes/No
- d. In the past two years, have you noticed your heart skipping or missing a beat: Yes/No
- e. Heartburn or indigestion that is not related to eating: Yes/No
- f. Any other symptoms that you think may be related to heart or circulation problems: Yes/No

7. Do you currently take medication for any of the following problems?

- a. Breathing or lung problems: Yes/No
- b. Heart trouble: Yes/No
- c. Blood pressure: Yes/No
- d. Seizures (fits): Yes/No

8. If you've used a respirator, have you ever had any of the following problems? (If you've never used a respirator, check the following space and go to question 9:)

- a. Eye irritation: Yes/No
- b. Skin allergies or rashes: Yes/No
- c. Anxiety: Yes/No
- d. General weakness or fatigue: Yes/No
- e. Any other problem that interferes with your use of a respirator: Yes/No

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: Yes/No

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

10. Have you ever lost vision in either eye (temporarily or permanently): Yes/No

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

Part B

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

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

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

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

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

∅-----

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

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

If ``yes," describe these exposures:-----

∅-----

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

5. List your previous occupations:-----

6. List your current and previous hobbies:-----

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

If ``yes," were you exposed to biological or chemical agents (either in training or combat):

Yes/No

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

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

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

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

a. HEPA Filters: Yes/No

b. Canisters (for example, gas masks): Yes/No

c. Cartridges: Yes/No

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

a. Escape only (no rescue): Yes/No

b. Emergency rescue only: Yes/No

c. Less than 5 hours per week: Yes/No

d. Less than 2 hours per day: Yes/No

e. 2 to 4 hours per day: Yes/No

f. Over 4 hours per day: Yes/No

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

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

If ``yes," how long does this period last during the average shift: _____ hrs. _____ mins.

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

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

If ``yes," how long does this period last during the average shift: _____ hrs. _____ mins.

Examples of moderate work effort are sitting while nailing or filing; driving a truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; walking on a level surface about 2 mph or down a 5-degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

c. Heavy (above 350 kcal per hour): Yes/No

If ``yes," how long does this period last during the average shift: _____ hrs. _____ mins.

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

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

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

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

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

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

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

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

Name of the first toxic substance:-----

Estimated maximum exposure level per shift:-----

Duration of exposure per shift-----

Name of the second toxic substance:-----

Estimated maximum exposure level per shift:-----

Duration of exposure per shift:-----

Name of the third toxic substance:-----

Estimated maximum exposure level per shift:-----

Duration of exposure per shift:-----

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

∅-----

∅-----

∅-----

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

∅-----

Appendix E

User Seal Check Procedures

User Seal Check Procedures

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, 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.

A. Positive pressure check.

- Close off the exhalation valve and exhale gently into the face piece.
- The face fit is considered satisfactory if a slight positive pressure can be built up inside the face piece without any evidence of outward leakage of air at the seal.
- For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

B. Negative pressure check.

- Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s).
- Inhale gently so that the face piece collapses slightly, and hold the breath for ten seconds.
- In the event that the design of the inlet opening prevents effective covering of the inlet opening with the palm of the hand, the test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove.
- If the face piece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

C. Manufacturer's Recommended User Seal Check Procedures

- The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that the employer demonstrates that the manufacturer's procedures are equally

effective.