

[Insert Site Name]

WRITTEN  
RESPIRATORY  
PROTECTION  
PROGRAM

[insert name]  
RESPIRATORY PROTECTION PROGRAM

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# RESPIRATORY PROTECTION PROGRAM

[SITE NAME]

## 1 INTRODUCTION

Respirators are to be worn only when other, more desirable means of controlling airborne contaminants are insufficient to reliably prevent exposure of workers to airborne contaminants in excess of recommended or regulated levels. Respirators must be worn to protect workers against overexposure whenever any of the following conditions apply:

- Engineering controls are infeasible, are temporarily out of service, or are being installed;
- A sudden, unexpected release of a hazardous vapor, gas, or dust has occurred.

The selection of the proper type of respirator for a given application is the responsibility of the [SITE NAME] Program Coordinator. If there is a question of the need, type or for respiratory protection, the Program Coordinator will consult the IH professionals.

All applicable aspects of the Respiratory Protection Program cover each worker to whom a respirator is issued. No worker is allowed to perform duties in which respiratory protection may be required unless all portions of this program have been satisfied regarding that individual.

## 2 PURPOSE

This respiratory protection program has been established to provide uniform and consistent procedures for those needing to wear respirators, either in the regular course of their duties or in emergencies. The program includes requirements for medical evaluation, training, and fit-testing of wearers; control of respirator selection, inspection, and maintenance; and recordkeeping. Standard operating procedures are included within, or attached to, this program.

Where feasible, exposure to contaminants will be controlled by elimination of or substitution for the substance, by engineering controls such as general and local ventilation, enclosure or isolation. When effective engineering controls are not feasible, personal protective equipment will be used to prevent exposure to contaminants in the workplace.

Any worker should not use respirators arbitrarily. Whenever there is reason to believe that a worker may be overexposed to airborne contaminants or a worker complains about such exposure, the problem will be investigated and appropriate measures taken. The solution may necessitate the use of a respirator.

### 3 SCOPE

This respirator protection program has been established for those operations within [SITE NAME] in which any type of respiratory protection is used.

This program covers [IDENTIFY FACILITY OPERATIONS, AREAS INCLUDED IN THE PROGRAM]

### 4 RESPONSIBILITIES

#### 4.1 Management

[SITE NAME] Management will:

- Ensure compliance with and local rules and regulations.
- Appoint and empower a Program Coordinator

#### 4.2 Program Coordinator

The Respiratory Protection Program coordinator [EMPLOYEE NAME] will:

- Attend respirator protection training;
- Interpret IH data to determine the need for RPE taken into consideration the exposure measured and their respective OELs and STELs and the statistical analysis of the IH data;
- Conduct a risk assessment of the work areas and job duties in which there is a reasonable possibility of worker exposure to airborne contaminants in excess of , Regulatory or generally accepted exposure levels;
- Employ, where feasible, engineering or other control measures not involving the wearing of respirators to prevent worker overexposure to airborne contaminants;
- Establish, maintain, and audit performance of a respiratory protection program annually;

- Manage the process that provides a respirator to each worker when such equipment is necessary to protect his or her health as determined by IH air sampling data or the qualitative risk assessment
- Ensure that respirators issued are applicable and suitable for the purposes intended taken into consideration of the APF required based on the IH quantitative or qualitative assessment;
- Ensure there is a procedure for cleaning, maintenance and storage of all respirators not routinely used, or not individually assigned;
- Maintain respirator supplies and oversight for purchasing RPE and associated supplies, including spare parts filters and chemical cartridges; obtain new equipment and maintain non-individually assigned equipment ready for reissue;
- Provide training and information for employees in the correct use, maintenance, cleaning and care of respirators. Respirators shall be repaired under the direction of the Program Coordinator.

The Program Coordinator for [SITE NAME], i.e., the person responsible for maintaining this program, is [NAME OF PROGRAM COORDINATOR].

#### 4.3 Employees

Each employee who wears respiratory protection will:

- Clean, disinfect and properly store as necessary, the respirator assigned for personal use.
- Inspect the respirator before each use and after cleaning and disinfecting. The inspection shall include a check for defects, missing parts and a face piece leak check. If a respirator is found defective, it shall be returned to the Program Coordinator for repair.
- Use, store, and maintain it in accordance with instructions and training received.
- Protect the respirator against damage and contamination.
- Report any malfunction of, or problem with, the respirator to the Program Coordinator or his/her supervisor.

- Communicate any questions or concerns regarding the use of respiratory protection to the attention of their supervisor or program coordinator.
- Perform a positive & negative respirator check each time a respirator is donned. [Attachment A]

## 5.0 ELEMENTS OF AN EFFECTIVE RESPIRATOR PROGRAM

- Respirators will be worn whenever required by management and/or the Program Coordinator.
- Respirators are selected on the basis of hazards to which the person is exposed with consideration given to safety and health factors as well as probable risk.
- Employees are fitted and a fit test performed.
- Respirators are cleaned and disinfected after each use. They are provided a location to store their respirator in a convenient, clean and sanitary location free of contaminants, which may contaminate or damage the components of a respirator.
- Respirators used on a regular basis are inspected during cleaning. Trained personnel replace worn or deteriorated parts with parts designed specifically for that respirator (i.e., same manufacturer). No attempt is made to replace components or to make adjustments or repairs beyond the manufacturer's recommendations.
- Self-contained breathing apparatus (SCBA) and emergency escape SCBA are thoroughly inspected at least once a month and after each use, and a written record is kept of inspection dates and findings. Since the SCBA is complex equipment, service of the device shall be limited to trained personnel certified by the manufacturer.
- Supervisors and workers are instructed and trained in the selection, use, care, and maintenance of respiratory protective devices. Training provides each user an opportunity to handle the respirator, to have it fitted properly, to test its face piece-to-face seal, to wear it in normal air for a familiarization period, and to wear it in a test atmosphere.
- Retraining will be performed as needed or at least annually to ensure an effective program. Employees that may be required (e.g. Emergency Response Personnel) to wear SCBAs, should practice wearing the equipment monthly.

- There are regular inspections and evaluations to determine the continued effectiveness of the program.
- Clean-shaven skin must be in contact with all respirator-sealing surfaces. Even a mild growth of whiskers may interfere with this seal. In addition, respirators will not be worn when conditions such as sideburns, a skull cap that projects under the face piece, temple pieces on corrective spectacles or goggles, or the absence of one or both dentures prevent a good face piece-to-face seal.
- Individuals will be examined medically before being assigned to use respirators. The examining Occupational Health professional will be given information about the equipment to be used. He or she should know whether it produces additional inspiratory and expiratory stress, whether it represents an additional weight, such as SCBAs, and whether it may cause an increase in the metabolic heat load, such as when used with a chemical protective clothing.

## 6.0 TYPES, USES AND LIMITATIONS OF RPE

### 6.1 Air-purifying Respirators

Devices that remove contaminants from the air the wearer is breathing are known as Air-purifying Respirators (APRs) or simply as respirators. The removal of contaminants is achieved by using either or both of the following:

- A filter containing fine mesh material that traps particulates;
- A cartridge or canister containing a chemical onto which gases or vapours are adsorbed.

The choice of RPE depends on:

- The nature of the contaminant (e.g. dust, gas, or mist);
- The extent of the hazard (e.g. concentration of the contaminant);
- The required protection that as a minimum reduces exposure below the appropriate OEL).

APRs can also be classified according to the way in which the air is drawn through the filter.

Negative-pressure respirators rely on the wearer's inhalation to draw air through the filter. They may:

- Cover the full face;
- Cover only the mouth and nose (known as half-face respirators);
- Be reusable;
- Be disposable.

Note: Nuisance dust masks and surgical masks are not classified as respirators.

6.1.1 Powered Air-purifying Respirators (PAPRs) also filter the air but the face-piece is pressurised by a blower motor. The wearer does not have to overcome the breathing resistance of the filter or chemical cartridge. Because the face-piece (hood, mask) is pressurised, PAPRs provide a higher level of protection than negative-pressure respirators. They are available in full-face and half-face versions and also in the form of hoods (covering the face and the top of the head) and blouses (covering the whole of the head and upper body).

It must be stressed, however, that the degree of protection provided by a respirator is only achievable if the respirator is well maintained, clean and worn correctly. In practice lower degrees of protection should be assumed.

Whatever classification system is in use locally, those selecting respirators should study the manufacturers' specifications and seek advice from EHS Leadership.

#### 6.1.2 Limitations of APR

All APRs have limitations:

- Because the respirators do not supply air, they cannot be used in oxygen-deficient atmospheres.
- APRs should not be used in atmospheres that are Immediately Dangerous to Life or Health (IDLH).
- The degree of protection is limited by the type and fit of the respirator.
- APRs have a limited service life. Mechanical filters and chemical cartridges may become totally loaded or saturated. The wearer may sense this through increased breathing resistance or by tasting or smelling the contaminant. The service life depends upon the concentration of the contaminant and the volume of the adsorbing material. Temperature and humidity may also affect service life. Respirator suppliers should be consulted to confirm the limitation of an APR for a particular hazard.
- Chemicals with low odor thresholds or poor warning properties, such as methanol or methylene chloride are of special concern. The user may not be aware if the respirator has failed. End-of-service-life for an APR cartridge can be managed by using respirators equipped with end-of-service-life indicators, or implementation of a cartridge change schedule. Respirator suppliers and/or the appropriate local regulatory authority should be consulted regarding implementation of a cartridge change schedule.



## 6.2 Air-supplying Respirators and Breathing Apparatus

The second class of respirators is the air-supplying type, also sometimes known as breathing apparatus. These devices supply fresh air to the wearer from an uncontaminated source. They include Self-contained Breathing Apparatus (SCBA) and Supplied-air Respirators (SAR) (or airline respirators). The wearer of an airline respirator is connected via a hose to an independent source of clean breathable air, supplied from either a compressor or compressed gas cylinders. Breathing air for this type of respirator must be of an adequate quality and flow rates must be within the specification stated by the manufacturers. General requirements for breathing air quality are listed in the table below.

Parameter	Limits
Oxygen (see <i>Note 1</i> )	19.9–23.5%
Carbon Monoxide	Not greater than 5 ppm (5.5 mg m <sup>-3</sup> )
Carbon Dioxide	Not greater than 500 ppm (900 mg m <sup>-3</sup> )
Water – liquid	There should be no free liquid water.
Water – vapour	The pressure dew point should be 5°C below the lowest foreseeable operating temperature. If the storage and operating temperatures are not known, a pressure dew point of -11°C should be assumed. Relative Humidity (RH) <85%. (see <i>Note 2</i> )
Odour and taste	Without significant odour or taste
Temperature	15–25°C
Particulate	Not greater than 0.5 mg m <sup>-3</sup>
Bacteria (colony forming units) (see <i>Note 1</i> )	Not greater than 5 cfu m <sup>-3</sup>
Oil (see <i>Note 3</i> )	Not greater than 0.5 mg m <sup>-3</sup>

Air-supplying respirators are used when a higher level of protection is needed than can be provided by air-purifying respirators. They may be used to provide protection against chemicals with poor warning properties or present in IDLH concentrations. When airline respirators are used in oxygen-deficient or IDLH environments, they can be fitted with emergency

canisters to provide at least 5 minutes supply of air to allow the wearer to escape should the compressor fail.

SCBA is generally used for emergencies, eg confined space entry, emergency rescue and fire fighting.

#### 6.2.1 Limitations of Air-supplying Respirators

Airline respirators have the following limitations:

- The hose can be no more than 90 metres (300 feet) long. This restricts the user's movement.
- The system requires a constant supply of breathable air from either a compressor or a cylinder bank.

SCBA has the following limitations:

- SCBA provides only 30 to 60 minutes of air under ideal conditions. The useful life is usually less, especially if the worker is working hard or breathing rapidly.
- The weight of the unit increases the workload in situations that may already be stressful because of high temperatures or work demands.
- The size of the air tank may make accessing small spaces difficult.

## 7.0 RESPIRATOR SELECTION

### 7.1 GENERAL.

The guidelines outlined in this section provide assistance in the selection of appropriate respiratory protection. [SITE NAME] will provide appropriate approved respiratory protective devices, and the employees will use these devices whenever necessary to protect their health due to the nature of the work environment. The Program Coordinator will assess the potential hazards and degree of controls, which can be exercised over each situation using risk assessment techniques. The respiratory protective devices selected in each situation will depend upon the information from a qualitative and/or quantitative determination of the hazard.

Respirator selection is intended to provide adequate worker protection for a specific hazardous environment. The following section will aid in the selection of respiratory protection.

## 7.2 SELECTION

RPE should be used only if it is approved or certified as providing adequate protection against the specific hazard for which it was selected. This approval or certification should be in accordance with the standards established by the competent authorities for the country in which the RPE will be used. If the country has no system to approve or certify RPE, then equipment that has been approved by recognised competent authorities of another country should be used. For example:

- In the USA, respirators are approved by NIOSH;
- In the EU, CEN approves standards for manufacturing respirators.

When selecting a respirator for a given task and the conditions in which it is to be performed, a number of factors should be considered. These factors should be identified either during a general risk assessment of the workplace or of the particular task.

### 7.2.1 Oxygen Levels

The first factor to consider with regard to the atmosphere is the oxygen level. If this is below 19.5% then the atmosphere is considered oxygen-deficient and APRs are not suitable.

### 7.2.2 Contaminant Factors

The next factors to consider are those relating to the contaminants that may be present. These factors include:

- Toxicity or irritant properties of the contaminant;
- OELs;
- Anticipated airborne concentration of the contaminant in the workplace, including whether there may be IDLH concentrations;
- The potential for skin absorption or eye or lung irritation;
- The physical state of the contaminant, e.g. whether it is a gas, vapour, particulate, liquid mist, or fume;
- Whether the contaminant has adequate warning properties, e.g. whether it can be seen, smelt or tasted.

It is essential to understand the chemical and physical properties of the contaminant as well as the workplace concentration. This may require a process review, literature review and workplace sampling.

### 7.2.3 Task and Employee Factors

Several factors relating to the task and the employee should be considered in the selection of respirators:

- Location of the operation, e.g. in a confined space, a production area or an area that may have an oxygen deficiency;
- Whether the operation will be a short-term single event or repeated as a part of on-going production;
- Whether the work activities require either a high degree of mobility or are confined to one area;
- Whether eye protection is also needed;
- The temperature and humidity of the work environment;
- The degree of physical exertion required;
- The worker's general state of health;
- The fit of the respirator to the worker's face.

Workers' medical status should be reviewed before they are assigned to a task requiring respirator use, and periodically thereafter based on local regulatory requirements and Occupational Health guidelines. For example, a worker may not be fit to use a negative-pressure respirator or physically able to wear SCBA and perform other required job tasks.

#### 7.2.4 Assigned Protection Factors

The protection factor of a respirator is defined as:

$$\text{protection factor} = \frac{\text{concentration of contaminant outside mask}}{\text{concentration of contaminant inside mask}}$$

For example, the an assigned protection factor of 10 implies that the respirator should protect the user if the contaminant concentration is no more than 10 times the OEL. As assignment of protection factors vary from country to country, it is important to check local legislation when selecting the appropriate respirator.

The concentrations and respective exposure limit(s) of contaminant(s) in the workplace should be considered in determining the protection factor required.

#### 7.2.5 RPE Selection Logic

When all the factors described above have been considered and, where appropriate, quantified, the respirator selection process can start. The RPE selection logic is a systematic approach, as illustrated in FIGURES 1, 2 and 3 which requires knowledge of the concentration and OEL of the contaminant. From there, the logic flow is determined by:

- The task (e.g. for fire-fighting, SCBA is the only option);

- The oxygen levels;
- Whether the contaminant concentration is more or less than the OEL;
- Whether the contaminant concentration is IDLH;
- Whether the contaminant is an eye irritant;
- The physical state of the contaminant.

Figure 1 RPE Selection Logic (General)

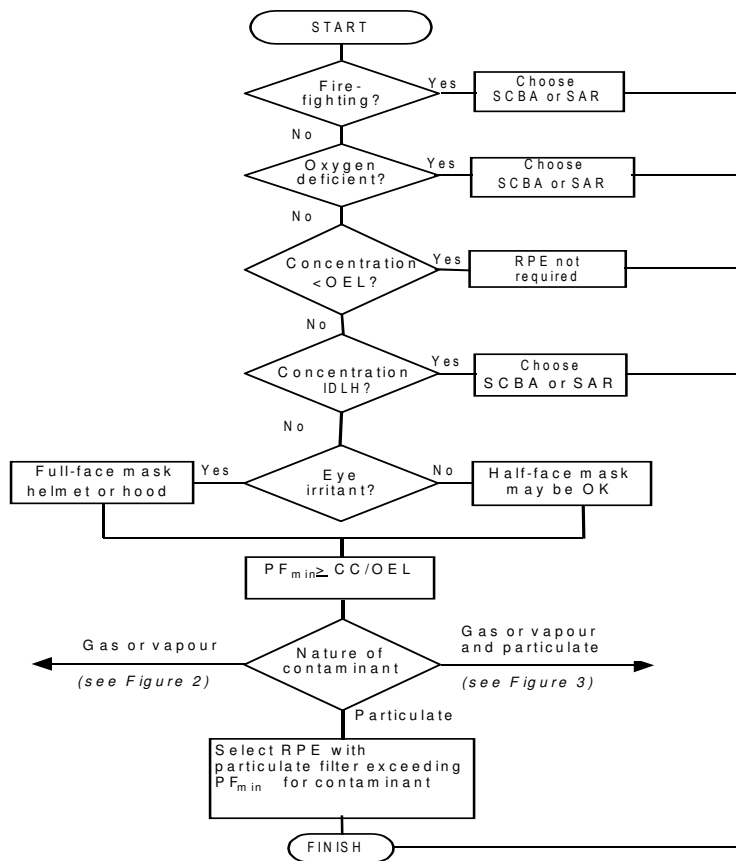


Figure 2 RPE Selection Logic (Gas or Vapor)

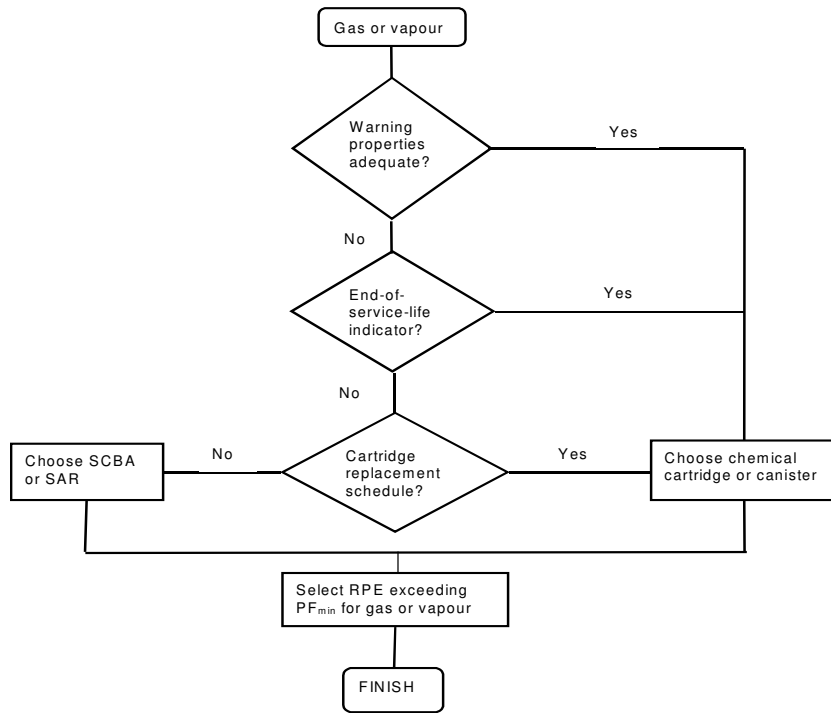
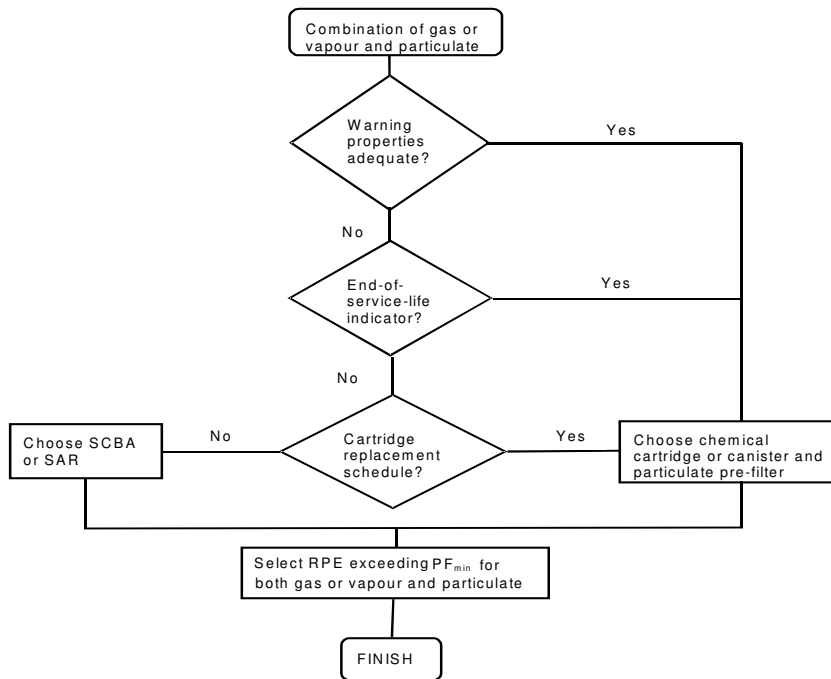


Figure 3 RPE Selection Logic (Combination)



The choice of respirator is based upon the minimum acceptable assigned protection factor. A respirator with a higher protection factor than is needed may be chosen for reasons concerned with employee comfort or production. Only those respirators approved by recognised agencies or authorities should be used.

### 7.3 EMERGENCY ESCAPE RESPIRATORS.

These devices constitute another class of non-routine use respirators. Any respirator that protects adequately against a hazardous atmosphere that has occurred suddenly may be used for escape purposes. However, these devices shall not be used for entry into this type of atmosphere even if that entry is for rescue purposes. Escape respirators shall be provided and carried by all individuals when there exists a potential for exposure to toxic materials at IDLH levels. [Examples of these types of situations may exist in portions of chemical plants, sewage treatment plants, and hazardous waste sites etc.] All emergency escape devices have limitations and these limitations must be taken into account when selecting one of these respirators. When entering a potential IDLH atmosphere, the employee will assess the egress route to ensure that the emergency egress time does not exceed the capacity of the escape respirator.

- If the toxic materials in question would cause eye irritation, then a full-face piece or hood must be used.
- Even full-face piece air-purifying emergency egress respirators such as gas masks are contaminant(s) specific and will fail to provide adequate protection at certain concentrations. In addition, these units will not provide a breathing atmosphere, and therefore, cannot be used in oxygen-deficient atmospheres.

### 7.4 RESPIRATOR ISSUANCE

#### 7.4.1 Individual-Use Respirators

The Program Coordinator should issue each employee required to wear a respirator individual-use respirators. As each respirator is permanently assigned to an individual, it is durably marked with the name or identification number of the assignee.

#### 7.4.2 Emergency Respirators

The Program Coordinator should ensure emergency use respirators are available in situations where their use is required for

trained emergency response personnel or evacuation purposes (e.g. escape respirators).

## 8.0 USER TRAINING AND FIT TESTING

Respirators should be chosen to fit individual wearers' facial features in order to achieve a good seal between the respirator and the wearer's face. In practice, this means that respirators are allocated to individuals. Facial hair affects the seal between the respirator and the face and for this reason it is imperative that beards are not grown in those areas of the face where the respirator is to be fitted.

It is also important to ensure that the respirator does actually form a good seal with the face. This is achieved by means of:

- Routine fit checks carried out by the worker each time the respirator is donned;
- More rigorous fit testing carried out when the respirator is first issued and annually thereafter.

### 8.1 Training

Training is an important component of a respiratory protection program and is essential for correct respirator use. For the training to be effective, it must be comprehensive and presented in an understandable way. A qualified individual such as a site EHS professional should conduct the training. As a result of the training, all respiratory users should be able to understand the operation of the respirator and be able to use it properly.

The training should cover the following topics:

- A discussion on why the use of the respirator is necessary. This should include:
  - The results of any applicable exposure risk assessments (eg the identification of any chemical agents);
  - The extent of exposure to these chemical agents;
  - The potential health effects of such exposures.
- Procedures for proper selection of respirators
- Procedures for:
  - Inspecting the respirator;
  - Donning and removing it;
  - Checking the fit and seal;
  - Wearing it.
- Information regarding the consequences of improper fit, usage or maintenance;



- Limitations and capabilities of the respirator selected, including cartridge end-of-life service indicators and change schedules;
- Proper procedures for maintenance and storage;
- How to use the respirator effectively in emergency situations, including situations where malfunctions occur;
- How to recognise medical signs and symptoms that may limit or prevent the effective use of respirators.

Refresher training should be conducted on a periodic basis or under the following circumstances:

- There is a change in the type of respirator used;
- When thorough inspection or observation, it is determined that the respirator user has not retained the requisite understanding or skill to use the respirator properly;
- Any other situation in which retraining appears necessary to ensure safe respirator use.

## 8.2 Fit Testing

### 8.2.1 Qualitative -Test Atmosphere

To assure proper protection, the face piece fit is tested prior to issuing the respirator. [IDENTIFY THE SITE SPECIFIC FIT TEST PROCEDURE USED]

Fit testing procedures may include: isoamyl acetate, irritant smoke, and saccharin mist.

Note: For convenience in testing, any cartridge-type respirator may be tested with any of the above test agents provided the cartridge element corresponds to the test agent in the above table.

8.2.2 Qualitative (Field Test) - Positive and Negative Pressure  
Each time a worker puts on the respirator, he or she should check for a good seal by using the positive-pressure or negative-pressure test given in Attachment A.

8.2.3 Quantitative Tests - These tests measure the actual leakage of test agent into the respirator. The test apparatus measures the concentration of the test agent inside the respirators and also outside the respirator to obtain the protection factor for a particular respirator being worn.

## 9.0 RESPIRATOR INSPECTION, MAINTENANCE & STORAGE

### 9.1 Inspection and Maintenance

As with all other personal protective equipment, it is important that inspection and maintenance procedures should be followed to ensure that respirators remain in good condition for subsequent use.

Every time a respirator is used, each piece part should be checked for:

- Cleanliness;
- Damage;
- Correct operation;
- Correct installation of valves and filters;
- General condition.

Trained personnel should replace defective or damaged parts before the respirator is used. Damaged disposable respirators should not be used.

The face-piece should be examined for:

- Excessive dirt;
- Cracks, tears, holes or physical distortion of the shape;
- Inflexibility of the face-piece;
- Cracked or badly scratched lenses in a full face-piece;
- Incorrectly mounted full face-piece lenses or broken or missing mounting clips;
- Cracked or broken air-purifying element holders, badly worn threads or missing gaskets.

The head straps and harness should be examined for:

- Breaks or excessive wear;
- Loss of elasticity;
- Broken or missing buckles.

The inhalation and exhalation valve should be examined for:

- Foreign material, such as detergent residue, dust particles or other contaminants;
- Cracks, tears, or distortion in the valve material;
- Incorrect insertion of the valve body in the face-piece;
- Cracks, breaks or chips in the valve body, particularly at the sealing surface;
- Missing or defective valve cover;
- Incorrect installation of the valve in the valve body.

The air-purifying elements should be examined for:

- Incorrect cartridge, canister or filter for the hazard;
- Incorrect installation;
- Loose connections;
- Missing or worn gasket;
- Cross-threading in the holder;
- Expired shelf-life date on the cartridge or canister;
- Cracks or dents in the outside case of the filter, cartridge or canister as indicated by the absence of sealing material, tape or foil over the inlet;
- Incorrect manufacturer (ie different from that of the respirator).

See Attachment C for additional guidance for conducting field inspections of respirators.

SCBAs for emergency use should be thoroughly inspected at least annually. Inspections should include the face-piece, hoses, regulator, air tank and any other components recommended by the manufacturer. The tank should be fully charged. Annual inspections should be documented.

SCBAs should be inspected every month to ensure that the case is sealed and that the unit is located where it should be. Monthly inspections should be documented on a sign-off sheet stored with the unit.

See Attachment D for additional guidance for compressed air inspections.

## 9.2 Cleaning and Sanitizing

Respirators should be cleaned properly on a regular basis using a sanitising solution or soap and water. The face-piece and other parts that could be contaminated should be thoroughly washed and rinsed. The final rinse should contain a sanitising agent selected for use with respirators. Cartridges, canisters and filters cannot be cleaned and should be removed. If air-purifying media are to be reused, they should be kept dry. After cleaning, the respirators should be allowed to dry naturally in the air.

Respirators used by more than one person should be cleaned and sanitised after each use.

## 9.3 Storage

RPE not discarded after use should be suitably stored away from areas of contamination or extreme temperatures. RPE should be marked or stored in a way that will ensure that only the assigned employee wears it.

Appropriate records should be kept of cleaning, maintenance and any performance testing required.

SCBAs reserved for emergency use should be fully charged and stored in sealed cases in areas where they may be needed for rescue or escape.

## 10.0 MEDICAL SURVEILLANCE

### 10.1 Physical and Psychological Limitations of Respiratory Wearers

An Occupational Health Professional shall determine what physical and psychological conditions are pertinent to the wearing of various types of respirators. These include, but are not limited to, respiratory impairment, cardiovascular impairment and claustrophobia.

### 10.2 Evaluation and Recordkeeping

The Program Coordinator will provide the examining Occupational Health Professional with information on each worker to be assigned to a task requiring the use of a respirator. The information's purpose is to enable the physician to assess medically the qualifications of the worker. Information will include the type of respirator to be worn, anticipated frequency of use, workload category, and other pertinent information.

The Occupational Health Professional will complete an evaluation report approving respirator use for each worker to whom a respirator is issued. (See Form 2).

## 11 EMERGENCY AND RESCUE-USE RESPIRATORS

### 11.1 Purpose and locations

SCBAs are used for emergencies and rescues. They are located in [LOCATION OF SCBAs].

### 11.2 Responsibilities

The Program Coordinator is responsible for arranging the training of those individuals permitted to use the SCBAs, and for the maintenance, care, and inspection of these respirators. Trainees will practice putting their respirators on and wearing them for a short period of time so that they are capable of using the respirator effectively. The manufacturer's standard operating procedures for care and use of SCBAs are attached by reference to this procedure. Employees are responsible for notifying the program coordinator after each use of the SCBA.

### 11.3 Cleaning and Inspection After Use

SCBAs are cleaned, sanitized and inspected after each use by the user. Air cylinders must be kept fully charged during storage.

### 11.4 Monthly Inspection and Cleaning

SCBAs and the air cylinders are inspected monthly according to supplier's inspection procedures. Contact the SCBA manufacturer for an inspection form.

### 11.5 Repairs

The Program Coordinator arranges all repairs to emergency equipment. Only a factory-certified repair person performs actual repairs.

## 12 RECORDKEEPING

The Program Coordinator maintains records for all respirator users. Records contain the information listed below:

12.1 Issuance data - To include type, manufacturer, model, and date of issue of all respirators issued to the employee (individual, common use, and disposable) (see Form 1).

12.2 Medical approval - Affirmation that employee is physically fit to wear respirator (see Form 2).

12.3 Fit testing - Date and test passed which satisfies the "test atmosphere" requirement for each respirator issued (see Form 3).

12.4 Training - Dates of initial and annual retraining, and training information covered.

12.5 Emergency respirators - Record of dates of monthly inspections should be on a tag retained on each respirator.

12.6 All repairs or replacements made to emergency respirators.

12.7 List of users (see Form 4)

## 13.0 EVALUATION OF RESPIRATOR PROGRAM EFFECTIVENESS

The Program Coordinator will evaluate at least annually, together with at least one experienced respirator wearer, the effectiveness of the respirator program. The Coordinator will take corrective action where defects are

found in the program. The following factors will be evaluated: (See Form 5)

- List of all respirator users
- Respirators are used as required.
- Wearers are properly trained.
- The proper type of respirators are issued and used.
- Respirators are worn properly.
- Respirators are in good operating condition.
- Respirators are inspected and maintained properly.
- Medical surveillance of respirator wearers is carried out.
- The proper types of respirators are selected.
- The respirators are properly stored.
- Fit testing is conducted properly.
- All pertinent records are kept.

The Program Coordinator will prepare and forward a written report to Site Management Team. The report will summarize findings and describe corrective actions, if any, to be carried out as a result of any deficiencies observed.

## ATTACHMENT A

### NEGATIVE-PRESSURE AND POSITIVE-PRESSURE FIT TESTS

#### Purpose:

Positive and negative-pressure fit tests are to be conducted by the Program Coordinator to evaluate suitability of design of a respirator intended for issuance to an individual wearer, and by the wearer after issuance before each use in a contaminated atmosphere.

These tests are performed as an aid to assessment of respirator function and to find gross leaks between the face and face piece. The negative-pressure test checks the pressure and functioning of the respirator exhalation valve, and the positive-pressure test checks the presence and functioning of the respirator inhalation valves, as well as leakage that may occur due to improper cartridge seal or respirator face fit. Successful negative-pressure or positive-pressure tests are required prior to each use of any respirator in a contaminated atmosphere.

#### Procedures:

##### 1. Positive-Pressure Test

Block off the exhalation valve cover openings with either your hand or a small piece of flexible material such as plastic film or latex. Exhale gently, creating a slight positive pressure within the face piece. A positive pressure should be maintained for at least 5 seconds. If no outward leakage is detected, the respirator fits and is seated properly.

##### 2. Negative-Pressure Test

Block off the respirator cartridge inlet openings with the palms of the hands or disposable latex gloves. Inhale gently, creating a slight negative pressure within the face piece. Hold the negative pressure for at least 5 seconds. If no inward leakage of air is detected, the respirator fits and is seated properly.

The remaining directions apply to both positive- and negative-pressure tests.

##### 3. If leakage is detected (usually felt as a cool sensation against the skin or a loss in pressure), the respirator is either malfunctioning or a gross leak between the face and face piece is present. Proceed as follows if a fit test fails:

1. Readjust the respirator, or else take it off and put it on again.

2. If the face piece continues to lose pressure although previous negative- or positive-pressure tests performed with that respirator had passed, it is probably malfunctioning. It is also possible for beard growth, new scars or wrinkles, missing teeth or dentures, or significant weight gain or loss to cause gross leakage into the face piece. Such changes in facial features require a new fit-test. In any case, consult your Program Coordinator.
3. If the Program Coordinator finds that a given respirator fails either fit test on a person during initial fit-testing, another brand or size of respirator should be tried. The failure was probably not due to respirator malfunction if all test respirators were inspected just prior to fit-testing.



## **ATTACHMENT B**

### STANDARD OPERATING PROCEDURE DISASSEMBLY, CLEANING AND MAINTENANCE OF RESPIRATORS

1. Remove cartridges or filters and all gaskets that are not fixed to seats.
2. Visually inspect face pieces and parts; discard faulty items.
3. Remove all elastic headbands.
4. Remove exhalation valve cover.
5. Remove speaking diaphragm or speaking diaphragms-exhalation valve assembly, or pressure-demand exhalation valve assembly.
6. Remove the inhalation valves.
7. Wash face pieces with detergent and warm water using a brush, sanitize and rinse thoroughly. (Maximum water temperature 140 F, optimum range 120(F to 140(F.) Parts removed from respirators may be washed separately as necessary.
8. Allow the masks to air dry in a clean area. Do not use a towel; it could leave lint on respirator that may interfere with proper functioning of respirator, i.e., cause valves to leak.
9. Disassemble and hand clean the pressure-demand and exhalation valve assembly, exercising care to avoid damage to the rubber diaphragm.
10. Visually inspect face pieces and all parts for deterioration, distortion, or other faults that might affect the performance of the respirators.
11. Replace any questionable or obvious faulty parts or assemblies including rubber components that show weather cracking when flexed or stretched, or distorted face piece. Replace only with parts specifically designed for that particular respirator.
12. Reassemble mask and visually inspect the completed assembly. Special emphasis should be given to inspecting the respirators for detergent or soap residue left by inadequate rinsing. This appears most often under the seat of the exhalation valve, and can cause valve leaking or sticking.
13. Install new or retested filters, and cartridges.
14. Clean and apply anti-fog agent (as needed) to lens per manufacturers' instructions (full face piece only).
15. Individually seal each mask in plastic bag.

## ATTACHMENT C

### FIELD INSPECTION OF AIR-PURIFYING RESPIRATORS

Air-purifying each use:

1. Examine the face piece for:
  - Excessive dirt;
  - Cracks, tears, holes or physical distortion of shape from improper storage;
  - Inflexibility of rubber face piece (stretch and knead to restore flexibility);
  - Cracked or badly scratched lenses in full face pieces;
  - Incorrectly mounted full-face piece lenses, or broken or missing mounting clips;
  - Cracked or broken air-purifying element holder(s), badly worn threads, or missing gasket(s).
  
2. Examine the head straps or head harness for:
  - Breaks;
  - Loss of elasticity;
  - Broken or malfunctioning buckles and attachments;
  - Badly worn serrations on head harness (full face piece only).
  
3. Examine the exhalation valve for the following after removing its cover:
  - Foreign material, such as detergent residue, dust particles or human hair under the valve seat;
  - Cracks, tears or distortion in the valve material;
  - Improper insertion of the valve body in the face piece;
  - Cracks, breaks or chips in the valve body, particularly in the sealing surface;
  - Missing or defective valve cover;
  - Improper installation of valve in valve body.
  
4. Examine the air-purifying element for:
  - Incorrect cartridge, canister or filter for the hazard;
  - Incorrect installation, loose connections, and missing or worn gasket or cross threading in the holder;
  - Expired shelf-life date on the cartridge or canister;
  - Cracks or dents in the outside case of the filter, cartridge or canister, indicated by the absence of sealing material, tape, foil, etc., over the inlet.

## **ATTACHMENT D**

### Guidance Procedure for the Use of Powered Air-Purifying Respirators (PAPRs)

This attachment is meant to supplement the Respiratory Protection Program and is specific to the use of powered air-purifying respirators (PAPRs). This appendix should be used in conjunction with the PAPR manufacturer's operation manual.

#### **1. Selections and Use**

PAPRs will be used in situations where adequate protection with an air-purifying respirator is appropriate. Units will be equipped with either a tight-fitting full facepiece or a loose-fitting hood or helmet. The loose-fitting headgear may be worn in areas where individuals are not required to shave, but have a need for respiratory protection given that this is an appropriate level of protection as determined by EHS.

PAPRs will not be utilized for situations where the hazardous substance lacks adequate warning properties (odor or taste), or the air concentration exceeds that which could adequately be protected from the use of a negative pressure air-purifying respirator. It will also not be used for emergency response situations in which an oxygen deficiency or IDLH atmosphere may be encountered.

#### **2. Location and Storage**

Respirators should be stored to protect them from weathering, contamination, and deterioration. The respirator should be located so that unauthorized users cannot "borrow" to enter the area.

Batteries should be charged in a location that is maintained at room temperature. Temperature extremes may shorten the capacity of the battery unit. Batteries should not be recharged in an enclosed area that lacks ventilation and charging units should not be stored on top of each other.

#### **3. Standard Operating Procedures**

Before entering an area where PAPRs are used, the following procedures must be followed:

1. Conduct an inspection of the facepiece unit to assure proper working order of all components. Check the lens for scratches, nicks, and gouges. Check the skirt, head strap, and buckles for any signs of damage or wear. Hoods or head covers should be checked for any holes/tears in the material;
2. Appropriate cartridges should be attached to the unit. Refer to the Respiratory Protection Program for information pertaining to cartridge selection and change-out schedules;

3. Batteries should be checked to ensure that they are fully charged;
  4. A flow check should be conducted according to the manufacturer's guidelines. Acceptable airflow is four cubic feet per minute (cfm) for tight-fitting facepieces and six cfm for loose-fitting facepieces; and
  5. When all of the above provisions are in place, the authorized employees may don the PAPRs in accordance with the manufacturer's specifications and enter the work area.
- Donning and doffing of PAPRs for use with pharmaceutical powders should be integrated into the applicable c-GMP gowning procedure.

In general:

1. Don disposable coverall (e.g., Tyvek™ suit), with or without integrated booties.
2. Don additional foot coverings (booties), if required.
3. After verifying proper operation and flow of PAPR unit, attach unit to breathing tube and loose-fitting hood.
4. With unit operating, don hood. Place ones head securely into the hood's head band so that it turns appropriately movement of ones head.
5. Working with a co-worker, tuck the inner shroud, or bib, of the loose-fitting hood inside the collar of the Tyvek suit.
6. Zip up the suit.
7. Secure the belt-mounted PAPR blower at the waist.
8. Don disposable gloves.
  - a. Overlap the sleeves of the coverall onto the first pair of protective gloves and secure with tape. Leave a trailing tail on the tape so that the tape can be removed, to allow removal of coveralls in advance of "primary gloves" upon exiting of the work area.
  - b. Don sleeve covers, if required.
  - c. Don a second pair of protective over-gloves.
9. Enter the work area following GMP entry procedures.

#### **4. Cleaning**

Individually assigned respirators should be cleaned and maintained by the user as needed. Shared PAPRs shall be cleaned and disinfected after each use in accordance with the manufacturer's operation manual. PAPR components (motor/blower, battery, breathing tube) and hoods should not be immersed in liquids and instead should be wiped down with a damp towel or sponge.

#### **5. Battery Maintenance**

There are two options for battery pack maintenance:

1. Assigning each user a battery pack and charger to individually maintain a charged battery; or
2. Establishing a central battery management system where an individual will be responsible for charging and distributing the batteries to the users. A central management system is usually effective in situations with large numbers of users.
  - a. When maintaining batteries, only use the charger supplied with the battery pack. The user should connect the battery to a charger at the end of each work shift and disconnect it at the beginning of the next shift. If a central charging area is used, the batteries should be clearly marked to avoid accidental usage of uncharged batteries. Reserve batteries should be available.
  - b. An expected run-time test should be conducted to determine the number of hours the battery will be able to power the respirator at the acceptable airflow rate. The battery should be fully charged prior to start of the test and the PAPR must be equipped with all cartridges, breathing tube, and head piece. The PAPR should maintain the required airflow for eight hours or the unit needs troubleshooting or repair. Follow manufacturer's instruction for conducting this test and for troubleshooting.
  - c. Batteries should be recharged when the recharge indicator light is on (if equipped) or when reduced airflow is detected. Note that an overloaded filter may also cause reduced airflow. Batteries should not be charged continuously for more than one week. This will cause deterioration of the battery pack due to heat generation. A typical service life for a nickel-cadmium ("NiCad") battery pack is 500 charge/discharge cycles.
  - d. For infrequent PAPR usage, it is recommended that battery packs be initially charged fully, and then follow the manufacturers' suggested schedule for maintenance of a full charge. This will prevent storage losses that may occur if periodic charging does not take place. Batteries subjected to long periods of storage (longer than 1-year) may lose their capacity to hold a full charge. Executing several charge and discharge cycles may restore battery capacity.

## **6. PAPR Unit Maintenance**

When any aspect of the PAPR system fails to work properly, the system must be immediately red tagged. An authorized service facility with factory-trained technicians should be contacted for repair. Contact your vendor, the Program Administrator or EH&S for contact information.

## **7. Battery Repair and Disposal**

Some batteries can be repaired if problems arise. Consult the manufacturer or EH&S for more information. Battery packs that have reached the end of their service life due to damage or age should be placed in a campus battery recycling collection box.

## **8. New Equipment Purchase**

The Respiratory Protection Program Administrator should authorize purchases of PAPR systems.

## **ATTACHMENT E**

### TESTING OF COMPRESSED AIR

#### 1. Air Sampling and Analysis

Air samples are analyzed for oxygen, carbon monoxide, carbon dioxide and gaseous/volatile contaminants.

Samples may be taken using a clean plastic sampling bag of 2–3 litres capacity, fitted with a small bore tube (6 mm internal diameter). The bag should be filled and emptied three times to ensure that the previous contents are removed. Once filled with air, the tube should be closed.

Detector tubes (eg Dräger, Gastec) may be used to monitor carbon monoxide, carbon dioxide and oxygen. It is important that manufacturer's instructions are followed.

Portable instruments (eg Dräger, MSA, Servomex and Teledyne) are also available for measuring these gases.

#### 2. Odor

The air must be free from all odors.

#### 3. Particulate Analysis

Air should be sampled (minimum of 1 m<sup>3</sup>) directly from the air supply using a pre-weighed glass fibre filter in a suitable in-line filter holder.

The exposed filter should be checked visually, preferably under a microscope, for dirt, black specks etc and should also be checked gravimetrically.

#### 4. Oil Mist

Collection of an air sample to detect oil mist should be as described for particulate analysis. Detector tubes are available for monitoring oil mist.

#### 5. Air Temperature and RH

Air temperature and RH should be checked using a wet and dry bulb thermometer, or preferably using a reliable portable solid-state instrument. Solid-state instruments can be held inside the air-suit for measurements.

## DESIGN OF COMPRESSED-AIR EQUIPMENT

A system must be available for warning and, if necessary, rescuing personnel working in air-suits or hoods in the event of other emergencies, eg the fire alarm sounding.

Arrangements must be made to ensure that alternative supplies of breathing air can be provided when necessary in the event of any emergency. This could include:

- Automatic switching to a stand-by compressor in the event of a compressor failure;
- Provision of portable compressed air cylinders able to provide sufficient air for evacuation or self-rescue, normally a five-minute SCBA tank that can be switched to by using a bypass valve;
- Air-suits provided with self-rescue breather pipes and filters when the hazardous substance is a particulate.

### 1 Compressors

New breathing air installations should be designed and installed as stand-alone systems, with no cross connection with instrument air.

Any form of oil-free compressor that will provide the required pressure and capacity may be used providing no offensive gases are produced during normal operating conditions, and that the water limit can be maintained. Separation devices should only be used if an oil-free compressor is not practical. PTFE ring compressors should not be used because of the risk of hazardous gases being generated due to overheating of the rings.

An air cooler should be fitted after the compressor to reduce the temperature to the required level.

Discrete water must be removed.

Air intake points should be located in a safe position well away from any predictable source of contamination, eg vehicle loading bays, solvent or fuel oil off-loading points etc.

### 1 AIR RECEIVERS

On new installations, air receivers should be either stainless steel or epoxy coated carbon steel.

Receivers should be sized to provide 360 litres min<sup>-1</sup> of air for at least 20 minutes for the maximum number of supply points likely to be in use at any one time.



## 2. Air-line

Breathing airlines must be clearly identified.

Couplings must be incompatible with the couplings used on other gas services. Quick-release couplings need to be used and precautions taken to prevent dust entering the system, eg clean covers provided for the couplings when they are not being used.

Air-lines should be non-corroding (eg copper, stainless steel or plastic), sized to give the required air flow at the point of use, and adequately secured. A filter should be fitted before the pressure reducer.

Pipe runs should have no dead-legs to collect water that may freeze in very cold weather, or provide a source of microbial contamination.

Air outlets should comprise a firmly mounted anchor point, an efficient hose coupling and an isolating device to seal the outlet valve when not in use. They should be sited so as not to be affected by rain, snow, ice, fumes, dust or bacteria.

Flexible hose should be non-kinking, resistant to the substances used on the plant and suitable and sufficient for the purpose of use. No more than 9,000 m of hose is permitted.

## 3. Alarms and Stand-by Air Supply

Written instructions must be provided for alarms and stand-by air-supply arrangements.

Non-oil lubricated compressors must have a high temperature and failure alarm.

Any previously installed oil lubricated compressors must have a high temperature or carbon monoxide alarm. If an on-line carbon monoxide alarm is not used, the air supply must be frequently monitored to ensure that carbon monoxide levels are below 5 ppm.

In the event of the air supply running low, an alarm must sound at a manned location and/or within the working area.

### MAINTENANCE OF COMPRESSED-AIR EQUIPMENT

All equipment must be maintained regularly as recommended by the supplier.

## 1 Compressors

Specified checks as recommended by the supplier should be conducted at 3-monthly intervals.

## 2 Air Receivers

Air receivers must be checked as pressure vessels at two yearly intervals or as specified by relevant legislation. Independent inspection companies should be used as appropriate. Test data must be recorded and retained as long as the receivers are in service.

## 3 Pre- and Post-filter Units

The filter units should be checked once a month for differential pressure. Where a differential pressure gauge is not fitted and the equipment is in continuous use, the filters should be changed at three monthly intervals.

## 4 Carbon-deodorising Unit

Carbon-deodorising units should be checked at two-yearly intervals or as recommended by the supplier. Activated carbon filter elements have a finite period of use and the manufacturers' guidelines should be followed.

## HUMIDIFICATION UNITS

In the event of air being humidified using micro-fog lubricant type equipment, strict maintenance of the equipment is necessary, including regular changing of the water to prevent the growth of micro-organisms.

### 1 Couplings

Quick release couplings should be checked at three-monthly intervals.

### 2 Maintenance Records

Maintenance records for all engineering work on breathing air systems must be kept for a least 5 years.

**FORM 1**

[SITE NAME]  
**EMPLOYEE RESPIRATOR ASSIGNMENT RECORD**

Employee Name: \_\_\_\_\_ Employee I.D. No.: \_\_\_\_\_

Job Title: \_\_\_\_\_ Date of Issue: \_\_\_\_\_

Respirator issued:

Cartridge Type(s)	Model	Manufacturer	Size
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Respirator use for:

To be used under the following conditions: \_\_\_\_\_

---

Estimated frequency of cartridge/filter replacement or respirator replacement  
(Disposable) - Air purifying respirators only (Check appropriate frequency below):

Hourly: \_\_\_\_\_ Twice/shift: \_\_\_\_\_ Daily: \_\_\_\_\_ Other: \_\_\_\_\_

**FORM 2**  
**RESPIRATOR MEDICAL EVALUATION QUESTIONNAIRE**

Name:  SS#: \_\_\_\_\_ Age: \_\_\_\_\_ Work Ex. \_\_\_\_\_

Company: \_\_\_\_\_ Dept. \_\_\_\_\_ Date: \_\_\_\_\_

Blood Pressure: \_\_\_\_\_ Pulse: \_\_\_\_\_ Height: \_\_\_\_\_ inches Weight: \_\_\_\_\_ lbs.

**Please answer all questions** with a check mark in the "Yes" or "No" column. "Yes" answers for a question that has additional clarifying questions require that you check all clarifying information that applies.

Have you ever had or do you now have:

**YES** **NO**

- |                          |                          |   |
|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Previous exposures to? a.) coal mine, foundry, quarry? <input type="checkbox"/>  |
|                          |                          | b.) chemical dusts, fumes, vapors, sprays, molds? <input type="checkbox"/>  |
|                          |                          | c.) fibers, e.g., asbestos, cotton? <input type="checkbox"/>  |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Contact lenses?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Eyeglasses?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Vision problems? a.) lost vision in either eye? <input type="checkbox"/> b.) color blind? <input type="checkbox"/>           |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Perforated ear drum?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Difficulty in hearing? a.) hearing aid? <input type="checkbox"/> b.) other hearing or ear problems? <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Dentures? a.) full? <input type="checkbox"/> b.) partial? <input type="checkbox"/>   |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Trouble smelling odors?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Facial injury, deformity or facial hair?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. High blood pressure?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. Irregular heart beat?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 12. A feeling that your heart is skipping or missing a beat? How often?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 13. Stroke?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 14. Heart attack?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 15. Heart failure?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 16. Heart disease or rheumatic fever?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 17. Other heart problem that you've been told about?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 18. Heartburn that is not related to eating?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 19. Chest pain/chest tightness? a.) when breathing deeply? <input type="checkbox"/>   |
|                          |                          | b.) during physical activity? <input type="checkbox"/>  |
|                          |                          | c.) that interferes with your job? <input type="checkbox"/>   |
| <input type="checkbox"/> | <input type="checkbox"/> | 20. Angina?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 21. Other symptoms that you think may be related to heart or circulatory problems?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 22. Emphysema?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 23. Asthma?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 24. Wheezing? a.) interferes with your job? <input type="checkbox"/>  |
| <input type="checkbox"/> | <input type="checkbox"/> | 25. Chronic bronchitis?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 26. Pneumonia?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 27. Tuberculosis?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 28. Silicosis?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 29. Asbestosis?   |
| <input type="checkbox"/> | <input type="checkbox"/> | 30. Lung cancer?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 31. Other lung disease or symptoms you think may be related to lung disease?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 32. History of collapsed lung?  |
| <input type="checkbox"/> | <input type="checkbox"/> | 33. Hay fever, allergies? a.) does it interfere with your breathing? <input type="checkbox"/>                                   |
| <input type="checkbox"/> | <input type="checkbox"/> | 34. Cough? a.) produces phlegm (thick sputum)? <input type="checkbox"/>   |

- b.) wakes you early in the morning?
- c.) occurs mostly when you are lying down?
- d.) produces blood?
- 35. Shortness of breath?
  - a.) when walking fast on level ground?
  - b.) b.) when walking up a slight hill/incline?
  - c.) when walking with other people at an ordinary pace on level ground?
  - d.) stop for breath when walking at your own pace on level ground?
  - e.) when washing or dressing yourself? f.) that interferes with your job?
  - g.) how many flights of stairs can you climb before experiencing shortness of breath?  2  4  6 or more
- 37. Diabetes? insulin dependent?
- 38. Epilepsy/seizures?
- 39. Anemia?
- 40. Difficulty in using hands or fingers?
- 41. Muscle or skeletal pain, stiffness, weakness, limited movement, fractures, surgery ?
  - a.) back? b.) knees? c.) neck? d.) arms? e.) ribs
  - f.) legs g.) other muscle or skeletal problem?
- 42. Chest injury? rib fracture or surgery?
- 43. Edema or swelling in legs or feet (not caused by walking)?
- 44. Fainting or dizziness?
- 45. Ever smoked? Pipe  Cigar  Cigarettes
- 46. Do you smoke now?
- 47. Have you smoked in the last 30 days?
- 48. Pregnant now?
- 49. Taking any medications?
- 50. Does working in enclosed areas bother you?
- 51. Does working at heights bother you?
- 52. Does climbing stairs/ladder carrying more than 25 lbs. bother you?
- 53. Ever wear a respirator? Type:
- 54. Does wearing a respirator bother you?
  - a.) eye irritation? b.) skin allergies or rashes c.) anxiety?
  - d.) general weakness or fatigue? e.) other problem?

**1.1 GIVE DETAILS OF POSITIVE RESPONSES**

Question #	Details

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

FORM 3

**RESPIRATOR FIT-TEST AND INSPECTION RECORD**

*Fit-Test Date:*

*Test Performed By:*

<b>Fit-test and Inspection Date</b>	<b>Employee Name</b>	<b>Pass/fail</b>

**FORM 4**  
**Inventory of Respirators**

RESPIRATOR TYPE	JOBS REQUIRING USE	PROTECTION FROM	PROTECTION FACTOR

**FORM 5**

**[Insert Facility Name] Respiratory Protection Program - Annual Evaluation**

		In place	Needed	N/A	Observations	Action Items	Responsible	Due Date	Status
<b>Management</b>									
	Management has designated a specific qualified person to manage the site respiratory protection program.								
	Management has established and maintains an appropriate inventory control system for respirators, filters, cartridges, and replacement parts for approved respiratory protective equipment in use and ensures that employees do not purchase and/or use respirators without the express permission of H&S.								
	Provide a respirator to each employee when such equipment is necessary to protect his or her health as determined by industrial hygiene air sampling data or qualitative risk assessment.								
	Provide Occupational health department on request a list of all employees who may wear respirators and/or work wher there is potential exposure to air contaminants.								



	Management ensures that all persons who wear respiratory protection are medically evaluated and attend annual training and fit testing.								
<b>Program Coordinator</b>									
	Assess and identify those areas and tasks in which there is a reasonable possibility of worker exposure to airborne contaminants over , regulatory or generally accepted exposure levels.								
	Maintains and updates documentation of areas and employees covered under this program and notifies occupational health department of this areas.								
	Ensures/selects respirators that are appropriate for the respiratory hazards identified per the respirator decision logic.								
	Ensures that use of a respirator is limited to its assigned protection factor (APF).								
	Ensure there is a procedure for cleaning, maintenance and storage of all respirators.								
	Ensures that respiratory protection has been selected and required for use for all activities where exposure to airborne contaminants may exceed the allowable limit (PEL, TLV, or OEL).								

	Ensures that voluntary use of a respirator has been approved/authorized, which means that an assessment has been conducted, users have been medically evaluated, and users have been trained in a manner that is consistent with the company's written respiratory protection program.								
	Assist in the annual training of personnel in the proper use, selection, maintenance and inspection of respirators.								
	Provide annual fit testing of respirators.								
	Employ, where feasible, engineering or other control measures not involving the use of respirators to prevent employee overexposure to airborne contaminants.								
<b>OH Department</b>									
	Perform annual medical evaluation to determine fitness and capabilities of employees to perform their jobs while wearing respirators, including: Questionnaire, and spirometry, if necessary.								
	Ensure that employees reporting medical signs or symptoms related to use of a respirator are sent for additional medical evaluation.								

	Ensure that supervisors and the program coordinator considers the need for medical reevaluation during fit testing and program evaluation and/or whenever a change occurs in the workplace conditions (e.g., work effort, protective clothing and temperature) that may substantially increase the physiological burden placed on the employee.								
<b>Employee</b>									
	Uses, cleans, disinfects and properly store as necessary, the respirator assign for personal use according with instructions and training received.								
	Inspects the respirator before each use and after cleaning and disinfecting for defects, missing parts, and face piece leak check (positive and negative pressure)								
	Protects the respirator against damage and contamination.								
	Report any malfunction of, or problem with the respirator to his or her supervisor or to the Program Coordinator.								
	Communicate any questions or concerns regarding the use of respiratory protection to the attention of their supervisor or Program Coordinator.								

	Change filters and/or canisters according to the period of time established by the Program Coordinator depending on the risk assessments performed.								
	Assist to annual training and fit testing.								
<b>Program Elements</b>									
	<b>Program elements/procedures have been developed that address:</b>								
	Selecting respiratory protection.								
	Medically evaluating employees prior to respirator use.								
	Conducting fit testing for tight-fitting respirators.								
	Properly using respirators for routine and foreseeable emergency situations.								
	Establishing schedules and procedures for cleaning and disinfecting, repairing, discarding, maintaining respirators.								
	Ensuring adequate air quality, quantity and flow of breathing air for atmosphere-supplying respirators.								
	Training workers in the respiratory hazards to which they are exposed [for routine and, if applicable, foreseeable emergency situations].								

	Training workers in the proper use of respirators, including putting them on and removing them, limitations on use, and maintenance.								
	Auditing and evaluating the effectiveness of the respiratory protection program.								
<b>Respirator Selection</b>									
	Respiratory hazards in the workplace have been identified and evaluated?								
	Reasonable estimates (using objective data) of the levels of employee exposure to the hazard have been made?								
	Where exposures cannot be reasonably estimated (or are unknown), they have been presumed to be immediately dangerous to life and health (IDLH)?								
	If exposure risk has been "classified" as IDLH, only respirators approved for use in IDLH atmospheres, have been selected?								
	If exposure risk has been "classified" as IDLH, air-purifying respirators have been properly excluded from use?								
	Are there any tasks that are conducted in an oxygen deficient environment, where use of an atmosphere-supplying respirator may be used?								

	Does the respirator selected for the identified hazards (and anticipated exposure level) provide an adequate level of protection in view of its Assigned Protection Factor (APF)?								
	Emergency use respirators (entry into IDLH atmospheres): have emergency rescue procedures been established and are these in effect?								
	Emergency use respirators are inspected monthly and maintained in a fully charged (>90%) state.								
<b>Medical Evaluation</b>									
	Follow-up medical examinations are conducted.								
	Medical evaluations are performed to determine the employee's ability to use a respirator.								
	Employees reporting medical signs or symptoms related to use of a respirator are sent for additional medical evaluation.								
	Ensure that supervisors, the program coordinator and/or administrator considers the need for medical reevaluation during fit testing and program evaluation and/or whenever a change occurs in the workplace conditions (e.g., work effort, protective clothing and temperature) that may substantially increase the physiological burden placed on the employee.								

**Fit Testing**

Before any employee may be required to use any respirator with a negative or positive pressure tight-fitting face piece, he or she is fit tested with the same make, model, style and size of the respirator that will be used.									
Procedures employed and interpretations of results for fit testing are consistent with those required by the regulatory authority.									
Ensure that QLFT is done with: a) isoamyl acetate; b) saccharin; c) irritant smoke.									
Employees using tight-fitting respirators are fit tested prior to initial use of the respirator.									
Employees using tight-fitting respirators are fit tested whenever a different respirator face piece (size, style, model or make) is used.									
Employees using tight-fitting respirators are periodically re-tested (fit tested) at least annually.									
Employees using tight-fitting respirators are fit tested whenever conditions that could affect respirator fit develop.									

	Fit testing of tight-fitting atmosphere-supplying respirators and tight-fitting powdered air-purifying respirators are conducted using qualitative or quantitative fit tests in the negative pressure mode regardless of the mode of operation (negative or positive) that the unit is used in for respiratory protection.								
<b>Use of respirators</b>									
	Conditions that impact the face piece seal of a respirator to the face are identified and controlled (e.g. facial hair).								
	Users have been advised and understand the consequences of removing their respirators in a hazardous environment.								
	Users have been trained and understand how to ensure the continued effective operation of their respirator throughout the work shift.								
	Users understand the special procedures that have been established for use of respirators in IDLH atmospheres.								
	Establish site-specific procedures for routine and 'foreseeable' emergency use of respirators.								
	Filters are labeled with the date of initial use and initials of the employee using it.								



<b>Users seal check</b>									
	Users of tight-fitting respirators are performing user seal checks, positive or negative (formerly called fit checks), each time they put on the respirator.								
	Ensure that respirator users understand that seal checks are not a substitute for qualitative or quantitative fit testing.								
	Ensure that the procedures established for donning a tight-fitting respirator are equivalent to either those recommended by the respirator manufacturer or those specified by regulation.								
<b>Maintenance and care of respirators</b>									
	Ensure that cleaning and disinfecting, storage, inspection, and repair of respirators has been provided as per manufacturer recommendations and that these satisfies applicable regulatory requirements.								
	Respirators are maintained clean, sanitized, and in good working order.								
	Respirators are cleaned and disinfected on a frequent basis and that the schedule for cleaning satisfies the frequency interval(s) specified by regulation.								

	Respirators that are used in fit testing and training are cleaned and disinfected after each use.								
<b>Breathing air quality</b>									
	Atmosphere -supplying respirators provide breathing air (gases) of high purity that meets the requirements for certification.								
	Ensure that cylinders of purchased breathing air have a certificate of analysis from the supplier that the breathing air meets the requirements of Grade D breathing air and that moisture content in the cylinder does not exceed a dew point of -50°F (-45.6°C) at 1 atmosphere pressure.								
	Ensure that breathing gas cylinders are marked in accordance with the local legislation.								
	<b>Breathing air from compressors:</b>								
	For compressor-supplied breathing air, ensure that minimum moisture content or dew point at 1 atmosphere pressure is 10°F (5.56°C) below the ambient temperature.								
	Ensure that sorbent beds and filters are maintained, refurbished and/or replaced as recommended by the manufacturer's instructions.								
	Ensure that sorbent beds and filters are tagged with the date of the most recent change and a signature of the person authorized to perform the								

	change. Ensure that these tags are maintained at the compressor.								
	If the compressor in use is an oil-less compressor, ensure that carbon monoxide in the breathing air does not exceed 10 ppm.								
	If the compressor in use is an oil-lubricated unit, ensure that the unit is equipped with either a high-temperature or carbon monoxide alarm, or both, to monitor carbon monoxide levels.								
<b>Training</b>									
	Ensure that all filters, cartridges and canisters used in the workplace are identifiable (labeled and color coded).								
	Ensure that labels are not removed and remain legible at all times. If a label becomes illegible, that filter, cartridge or canister is replaced.								
	Ensure that all training on respirators is provided to all employees who are required to wear a respirator.								
	Ensure that employees are trained in the use and limitations of selected respiratory protection and in donning, cleaning and maintenance procedures.								

<b>Program Evaluation</b>									
	Ensure that periodic checks are performed (by the program coordinator or administrator) to ensure that the respiratory protection program is being properly implemented.								
	Ensure that the program coordinator or administrator periodically consults with employees in the program to ensure that employees are using respirators properly.								
	Respirators fit and do not adversely impact on worker/work task performance; the respirator in use is appropriate for the hazard; the respirator in use is appropriate for the workplace conditions encountered; equipment is being properly maintained.								
	Ensure that the respiratory protection program is updated periodically (at a minimum, annually).								
<b>Record-keeping</b>									
	Ensure that records for respirator medical evaluations are maintained.								

	<p>Ensure that the OH receives the required work site/work task descriptions to properly perform the required medical evaluation, including information on: a) the type and weight of the respirator to be used by the employee; b) description of the work/task; c) information on the duration and frequency of respirator use, including whether for routine use or rescue and escape; d) the expected physical work effort; e) protective clothing and equipment to be worn; and the temperature and humidity extremes that may be encountered.</p>								
	<p>Ensure that records for fit testing are maintained and include: a) name or identification of the employee tested; b) type of fit test performed (QLTF or QNFT); c) specific make, model, style and size of respirator tested; d) date of test; an, e) pass/fail results for QLFTs or the fit factor and strip chart recordings or other record of test results for QNFT.</p>								
	<p>Ensure that fit testing records are maintained until the next fit test is administered.</p>								
	<p>Ensure that a written copy of the current respirator program is available for referral, audit, and/or inspection.</p>								