

Hamilton College Occupational Health and Safety Procedures

PROCEDURE 5.0—RESPIRATORY PROTECTION PROGRAM

5.1 INTRODUCTION

Purpose

Personal Protective Equipment (PPE) in general, and respiratory protection equipment specifically, is designed to help protect employees from anticipated or recognized workplace hazards. However, respiratory protection equipment does not constitute the only method for controlling hazards. It should be used in coordination with other hazard control measures, such as engineering controls (ventilation/process modification), administrative controls (training, signage), and other safe work practices (SOP's). When applied properly, the use of multiple hazard control strategies will help to ensure all Hamilton College employees (and students) are adequately equipped to ensure one's health and safety.

Scope & Application

The Federal Occupational Safety and Health Regulations, specifically part 1910.134, requires employers to implement a respiratory protection program to protect employees from anticipated or recognized airborne hazards in the workplace. This plan will provide the necessary guidance to enable the college to do just that. The OSHA standard may be accessed [HERE](#).

Authority

The subject material in this procedure is based upon requirements of federal law, generally recognized occupational health and safety practices, and/or criteria established by the National Institute of Occupational Safety and Health (NIOSH).

Focus of This Procedure

The focus of this procedure is to further describe Hamilton College's Personal Protective Equipment (PPE) programs principally as it relates to the use of respiratory protection, when such equipment is specified and required for use by college personnel. The voluntary use of certain types of respiratory protection equipment is described below, and in greater detail in section 4.4 of the Personal Protective Equipment program. Respirators should be used only when engineering controls (e.g. enclosure or confinement of the operation, ventilation or substitution of less toxic materials) are not feasible, or where additional personal protection is required. When respirators are to be used, all requirements of this section shall be met.

5.2 RESPONSIBILITIES

1. Hamilton College

Hamilton College shall provide the proper respirators when such equipment is necessary to protect the health and safety of the employee. The college shall be responsible for the establishment of a respirator protection program in accordance with Title 29, Code of Federal Regulations, OSHA 1910.134.

2. Academic/Administrative Department Heads & Supervisors

Department heads and supervisors shall:

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- Identify and report job areas that require or may require respiratory protective equipment, as well as the personnel under their supervision required to wear respirators.
- Assure that employees wearing respirators voluntarily do not wear a respirator in a required use situation, and that new employees in positions which require respirator usage are pre-qualified before their new assignment.
- Assure that employees are properly trained on the use, limitations, maintenance, cleaning, and disposal of respirators, in consultation with the Office of Environmental Protection & Safety.
- Purchase and maintain an inventory of spare parts and new respirators as is necessary.

3. Office of Environmental Protection, Safety & Sustainability (EPS&S)

The Office of EPS&S is responsible for the development, documentation, and administration of the Hamilton College respiratory protection program. The Director of EPS&S shall serve as the Respirator Program Administrator. The Director shall:

- Develop a written program;
- Evaluate respiratory hazards in the work environment;
- Provide guidance to departments for the selection and purchase of approved respirators;
- Provide instruction to departments on the proper use, maintenance, and storage of respirator equipment;
- Provide a fit testing program for respirator wearers;
- Maintain fit testing, initial training and retraining records;
- Administer the medical prequalification program with a suitable occupational health care provider; and
- Evaluate the overall effectiveness of the respiratory protection program on an on-going basis.

4. Respirator Wearers

The respirator wearer shall:

- Initially/annually complete the OSHA questionnaire, as well as any medical evaluations that may be required as per the occupational health care provider;
- Use respirators in accordance with instructions and training received;
- Store, clean, maintain, and guard against damage to respirator equipment;
- Report any deficiencies or malfunctions of a respirator to the Director of EP&S;
- Go immediately to an area having respirable (clean) air if the respirator fails to provide proper protection or malfunctions; and
- Receive a fit test and retraining at least annually.

5.3 RESPIRATORY PROTECTION EQUIPMENT

The basic purpose of any respirator is to protect the respiratory system from inhalation of hazardous agents/atmospheres. Respirators provide protection either by removing contaminants from the air before it is inhaled or by supplying an independent source of respirable air. Since Hamilton College only provides certain types of respirators for select job classifications, this section will focus on those types, and describe the other types in limited detail.

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1. Air Purifying Respirators (APR's)

APR's are respiratory protection devices that allow ambient air, prior to being inhaled, to pass through a filter, cartridge, or canister, to physically or chemically remove contaminants.

Different filters/cartridges/canisters remove different contaminants. Because these devices do not otherwise alter the incoming air, **oxygen must be present** in sufficient levels when using APR's.

- Non-Powered APR's—The breathing action of the wearer operates the non-powered type of APR. Equipped with a tight-fitting facepiece and filter(s), the respirator is secured to the face by means of a strap or harness. The wearer pulls air through the filters during inhalation. 2 different varieties of non-powered APR's are generally available:
 - Filtering Facepieces—These types of respirators have a facepiece that is composed mostly of the filter. Some filtering facepieces are certified by NIOSH for limited protection against particulate hazards (those with a NIOSH TC-84xxx number, and an alpha-numeric rating with the letters N, R or P and numbers 95, 99 or 100), while others are dustmasks only with no NIOSH certifications, and are only suitable for nuisance particulates.
 - Full-Face or Half-Face Respirators—These types of respirators provide greater protection than the filtering facepiece because their construction allows for a better fit. These respirators provide protection against dusts, mists, fumes, vapors, gases, or any combination of these contaminants depending on the type of filter used. The full facepiece provides the greatest degree of protection in the APR class, and protects the eyes as well.
- Powered Air Purifying Respirators (PAPR's)—The powered type of APR contains a portable blower, which pushes ambient air through a filter which then supplies purified air to the wearer. The powered type is equipped with a tight-fitting facepiece or a loose-fitting helmet, hood, or suit. A loose fitting PAPR does not require a fit test. However, inspection to insure proper flow rate and operation is required for safe use.

2. Atmosphere Supplying Respirators (ASR's)

ASR's provide a clean source of air from a tank or compressor to the wearer. ASR's provide a greater level of protection than APR's because they don't rely on a filtering mechanism to provide clean air.

- Self-Contained Breathing Apparatus (SCBA)—The wearer carries a supply of air, oxygen, or oxygen-generating material. Normally equipped with full facepiece, but may be equipped with a half-mask facepiece, helmet, or hood.
- Air-Line Respirators—Respirable air is supplied through a small-diameter hose from a compressor or compressed air cylinder. The hose is attached to the wearer by a belt and can be detached rapidly in an emergency. A flow-control valve or orifice is provided to govern the rate of airflow to the wearer. Exhaled air passes to the ambient atmosphere through a valve or opening in the enclosure (facepiece, helmet, hood, or suit).

5.4 MEDICAL PREQUALIFICATION

When using an APR, breathing can become more difficult because the flow of air is reduced by a filter or cartridge. Therefore, OSHA requires a determination be made by an occupational health

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care provider as to whether or not the employee is medically able to use respiratory protective equipment. Certification of fitness is required for all wearers of air-purifying respirators, when such use is required by the employer. The Office of EPS&S will manage the medical prequalification program, in consultation with the occupational health care provider, to certify personnel fit to wear respirators. The components of this program will vary by the type of respirator, length of time per day the respirator will be used, the type of work being done while the respirator is being worn, the age of the worker, and other factors. Medical prequalification must be done initially before an employee may wear a respirator, and annually thereafter. While the health care provider will principally manage the medical aspects relative to the prequalification requirements, the first step in this process includes initial/annual completion of the OSHA questionnaire, as illustrated in Appendix A below.

5.5 RESPIRATORY HAZARDS & RESPIRATOR SELECTION

Respirators are selected by a qualified safety and health professional. Many factors are considered in order to select the proper respirator. Respirator selection is based on:

1. Characteristics of Hazardous Operation or Process

- Hot operations: welding, chemical reactions, soldering, melting, molding and burning;
- Liquid operations: painting, degreasing, dipping, spraying, brushing, coating, etching, cleaning, pickling, plating, mixing, galvanizing and chemical reactions;
- Solid operations: pouring, mixing, separations, extraction, crushing, conveying, loading, bagging and demolition;
- Pressurized spraying: cleaning parts, applying pesticides, degreasing, sand blasting and painting; and
- Shaping operations: cutting, grinding, filing, milling, molding, sawing and drilling.

2. Nature of hazard—Air contaminants include particulate solids or liquids, gaseous material in the form of a true gas or vapor, or a combination of gas and particulate matter.

- Gaseous contaminants
 - Inert gases (helium, argon, etc.), which do not metabolize in the body but displace air to produce an oxygen deficiency;
 - Acid gases (sulfur dioxide, hydrogen sulfide, hydrogen chloride, etc.) which are acids or produce acids by reaction with water;
 - Alkaline gases (ammonia, etc.), which are alkalies or produce alkalies by reaction with water;
 - Organic gases (butane), which exist as true gases;
 - Vapors from organic liquids (acetone); and
 - Organometallic gases (tetraethyl lead, organo-phosphates, etc.), which have metals attached to organic groups.
- Particulate contaminants
 - Dusts. Mechanically generated solid particulates (0.5 to 10 mm);
 - Fumes. Solid condensation particles of small diameter (0.1 to 1.0 mm);
 - Mists. Liquid particulate matter (5 to 100 mm); and
 - Smoke. Chemically generated particulates (solid and liquid) of organic origins (0.01 to 0.3 mm).

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3. Concentration of contaminant

- Permissible Exposure Limit (PEL): These are the upper exposure limits of airborne concentrations that are accepted as safe, as established by OSHA. The Time Weighted Average (TWA) is the maximum concentration that employees working eight hours per day, forty hours per week can be exposed to with no adverse health effects;
- Threshold Limit Value (TLV): These are the upper exposure limits of airborne concentrations that are accepted as safe for employees to be exposed to on a day-in, day-out basis, as established by the American Council of Governmental Industrial Hygienists;
- Short Term Exposure Limit (STEL): An exposure limit that is the maximum concentration to which workers can be exposed for a period of up to 15 minutes with no detrimental effects.
- Ceilings are concentrations that should not be exceeded for any part of the workday;
- Immediately Dangerous to Life and Health (IDLH): Conditions that pose an immediate threat to life or health or conditions that pose an immediate threat of severe exposure to contaminants, such as radioactive materials.

4. Respirator Design

- NIOSH Approved: All respirators used on campus must be approved by the National Institute of Occupational Safety and Health (NIOSH). NIOSH approved respirators are labeled with a NIOSH ID number. Filters are labeled with the type of hazard the respirator is approved to protect against. Respirator replacement parts are labeled with part numbers and only approved replacement parts should be used. Any modifications that do not use approved replacement parts voids the approval of the respirator.
- Enclosure Design
 - Tight-fitting units: full facepiece and half-mask
 - Loose-fitting units: hood, helmet, and enclosed suit

5. Location of Hazardous Area

- Confined Spaces; and
- Proximity to non-contaminated "clean" environment.

6. Worker Activity

- Duration of job;
- Physical exertion: light, medium, heavy; and
- Temperature of job area.

5.6 APR CARTRIDGE/FILTER/CANISTER SELECTION

The terms cartridge, filter, and canister are often used interchangeably when referring to APR's, and it may actually be appropriate when using combination cartridges. However, cartridges/filters usually refer to the device's ability to remove particulate hazards, while canisters usually refer to the device's ability to remove gas/vapor hazards. As such, the following will address these 2 types of protective devices.

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1. Cartridges/Filter for Particulate Protection

There are currently nine new classes of cartridges/filters, as follows:

Filter Series	Use in Oil Atmospheres	% Efficiency
N	No	95, 99 or 100
R	Yes, Maximum 8 hours	95, 99 or 100
P	Yes, Possible for longer than 8 hours	95, 99 or 100

The 100 series (formally called HEPA) are now pink or magenta colored, indicating the highest level of particulate protection.

2. Canisters for Gas/Vapor Protection

While there is general consistency amongst respirator canister manufacturers regarding the type of contaminants a select canister will remove, there are also some variations. This is an issue that OSHA is still working to correct. Nonetheless, most canisters are color coded as follows:

Canister Color	Contaminant Removed
White	Acid gases
Black	Organic vapors
Yellow	Acid gases and organic vapors
Green	Ammonia vapors

Other colors exist for select gas/vapor hazards, dependent upon the manufacturer.

3. Combination Cartridges/Filters/Canisters

Some respirator manufacturers combine the particulate and gas/vapor protections by either allowing the addition of a filtering device over the gas/vapor canister, or combining the two properties into a single device, called a combination cartridge. While there remain some variations in color coding by manufacturer, most combination cartridges are pink or magenta, signifying their HEPA/100 series particulate protection, and some gas/vapor color. For example, a combination cartridge that is pink (with a P-100 designation) and yellow is acceptable for use for particulates, organic vapors and acid gases.

4. Length of Time a Cartridge/Filter/Canister May be Used

The length of time a cartridge/filter for particulate protection, a canister for gas/vapor protection, or a combination cartridge will protect against contaminants is dependent upon a number of factors, including:

- Hazards present;
- Contaminant concentration;

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- Breathing rate;
- Humidity; and
- Temperature.

If a cartridge/filter/canister does not have an end of service life indicator, the Director of EPS&S will develop a cartridge/filter/canister change-out schedule based on the above considerations and data that will ensure that the devices are changed before the end of their service life. This information will be obtained from the manufacturers test data and distributed to wearers at the time of fit testing or refit testing, and as needed. As a general rule of thumb, Hamilton College policy will be that no cartridge/filter/canister should be used for more than 8 hours, or as otherwise determine be changes in breathing resistance while wearing an APR with cartridges/filters/canisters attached. A good way of keeping track of the time is to note the hours a pair of cartridges/filters/canisters have been used by notation with a permanent marker on the devices themselves. This will ensure that they are not used over an 8 hour period of time.

5.7 RESPIRATORY FIT TESTING

Respiratory protective equipment must be fit tested to the wearer before they are issued a respirator. Dependent upon a number of factors, quantitative or qualitative fit tests will be performed. At the conclusion of fit testing, a fit test report will be completed and signed by the Director of EPS&S (or the occupational health care provider), indicating that the wearer has successfully completed the respirator certification program and the fit testing and training requirements. The fit test report is valid for 1 year. Refitting is required when job duties necessitate a change in respirator equipment, when body-weight changes (+/- 20 lbs.) or if a facial structure changes, and at least annually from the initial fit test. The 2 types of fit test include the following:

1. Qualitative Fit Tests

The worker is exposed to an atmosphere containing an odorant, irritant or taste agent and then asked to breathe normally, breath deeply, move head side to side, move head up and down, grimace, bend at the waist, and talk. The wearer reports any noticeable odor or taste agent that is leaking into the mask. There are 3 typical agents used during quantitative fit tests. They are banana oil (odorant), irritant smoke (irritant), or bitrex (taste agent).

2. Quantitative Fit Tests

A particle counting instrument is used to accurately measure respirator fit by comparing the dust concentration in the surrounding air with the dust concentration inside the respirator. The ratio of these concentrations is called the fit factor. A modified filter cartridge (or a modified respirator facepiece) equipped with a sampling port is used to collect air from inside the respirator. With the sampler attached, the wearer is asked to: breathe normally, breath deeply, move head side to side, move head up and down, grimace, bend at the waist, and talk. During these movements, any leakage is measured by the particle counting device. After the fit test, a final fit test report is generated. An acceptable fit test is a measured fit factor at least 10 times greater than the assigned protection factor (APF). APF's are a characteristic of respirator design. A fit factor of at least 10 times the APF is used as acceptance criteria because APF's are not considered reliable predictors of performance levels that will be achieved during actual use.

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3. Field Fit Checks, and Other Considerations for a Proper Fit

After successfully completing a fit test, employees must check the fit of their respirator immediately before and periodically during actual respirator use in the field.

- Positive Pressure Check—Cover the exhalation valve with your hand and exhale gently into the facepiece. If a slight positive pressure is built up inside the facepiece without any evidence of leakage, the fit is satisfactory. This test method is the most widely used to check proper fit in the field.
- Negative Pressure Check--Close off the air inlet valves (i.e., cover the cartridges with your hands), inhale gently to collapse the facepiece slightly, and hold your breath for 10 seconds. If the facepiece remains slightly collapsed and no leakage is detected, the respirator fits properly. It may be difficult to get a good seal when trying to cover the inlet valves (cartridges).

4. Other considerations for proper fit include:

- Facial Hair—A person who has hair (stubble, mustache, sideburns, beard, low hairline or bangs) which passes between the face and the sealing surface of a tight-fitting facepiece shall not be permitted to wear a respirator with a tight fitting facepiece. A person who has hair (mustache, beard) which interferes with the functions of the respirator valve(s) shall not be permitted to wear a respirator.
- Glasses and Eye/Face Protective Devices—If a spectacle, goggle, faceshield or welding helmet must be worn with a respirator, it shall be worn so as not to adversely affect the respirator seal. Spectacles that have temple bars or straps which pass between the sealing surface of a respirator facepiece and the wearers face shall not be used. If a full facepiece respirator is used, special frames for mounting prescription glasses are available if needed.

5.8 ISSUANCE AND ASSIGNMENT OF RESPIRATORS

1. Required Use of Respirators

If an employee is required to wear any respirator by the employer, then the employee is to be placed in the Hamilton College Respiratory Protection Program. The following are specific examples of activities and/or job classifications where respiratory protection is required:

- Physical Plant painting personnel engaging in spray painting activities, where engineering controls are not available. While a paint spray booth (engineering control) is available for “spot” spray painting in the Paint Shop itself, painting personnel are occasionally required to use industrial spray painting equipment to apply paint outside of the shop, say, in a dorm hallway. When applying paint in this fashion, engineering controls are infeasible, and respiratory protection is required. Since there are 2 respiratory hazards involved here (the particulate paint mist and the thinning agent in the paint), painting personnel will select a full-face APR with combination cartridges, meaning they are P-100 magenta colored for their particulate protection, and black for organic vapor protection.
- Physical Plant horticultural and grounds personnel engaging in certain pesticide application activities are required to wear respirators when either of 2 conditions exist. If the pesticide label (or MSDS) requires the use of a respirator regardless of the application method, or if the method of application (like the gross spraying of a field on a tractor as opposed to spot hand applications) exposes the applicator to uncontrolled mists, then respiratory protection is

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required. Based upon the particulate mist hazards, pesticide applicators will select a full-face APR with a P-100 magenta colored cartridge/filter.

- Miscellaneous chemical manipulation activities, as determined by the Director of EPS&S and the Science Stockroom & Facility Coordinator, may sometimes involve the handling or dispensing of chemicals without the benefit of a chemical fume hood (engineering controls). There might also be the occasional emergency spill response to minor chemical spills on college grounds, where the use of respiratory protection may be required. In any of these instances, the Director of EPS&S will make a determination (based upon the nature of the hazards involved and their ambient concentration through air monitoring) as to whether or not existing protective equipment provides sufficient respiratory protection, thus enabling their use. Typically, the Director of EPS&S and the Science Stockroom & Facility Coordinator will use a full-face APR with combination cartridges, which are P-100 magenta colored for particulate protection, and yellow colored for acid gas/organic vapor protection.
- Academic faculty/employees in the Studio Art Ceramics program engaging in certain product mixing activities, like the handling of dry clay dust with silica hazards, are required to wear respirators when engineering controls are not available. The clay mixing room in the List Art facility is equipped with a ventilation system (engineering controls) designed to provide local exhaust ventilation to the various clay mixing/preparation devices they use. In the event that 1—the ventilation equipment is inoperable, 2—the mixing activities must take place away from the ventilation equipment, or 3—the duration of mixing activities is long enough to warrant additional personal protective equipment despite the engineering controls, then respiratory protection is required. Based upon the particulate hazards associated with the silica dust, personnel mixing clay dust will select a full-face APR with a P-100 magenta colored cartridge/filter.

2. Voluntary Use of Respirators

As noted in section 4.4 of the written Personal Protective Equipment program, when an employee chooses to use a dustmask or filtering facepiece for comfort or nuisance protection, and not for protection against levels of contaminants that would “require” respiratory protection, the employee does not need formal training in accordance with the full respiratory protection program, or fit testing. However, if an employee wishes to use a respirator with a tight fitting facepiece (i.e. half-face or full-face with filter) voluntarily, then the employee must be placed in the full respiratory protection program. It is largely the responsibility of department chairs/supervisors to assure that employees wearing dust masks on a voluntary basis do not wear respirators in a situation that would require a respirator, such as above the exposure limit or action level. Call the Director of EPS&S to evaluate respiratory hazards.

3. Student Use of Respirators

While the college desires to create an academic environment where airborne (and other) hazards are controlled without having to rely on respirators/PPE, there may be the occasion where departments/supervisors might opt to equip students with respiratory protection equipment. And while students engaged in wholly academic activities are not generally covered by OSHA regulations and this written program (unless they are paid in some capacity by the college, i.e. teaching assistant, research assistant, work-study, etc.), the college is obligated to extend some elements of this written program to ensure student protection while wearing respirators. When situations arise where student use of respirators is contemplated by departments or supervisors,

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they should consult with the Office of EPS&S so as to ensure that the necessary elements of this written program are properly administered.

5.9 TRAINING

Personnel wearing respiratory protection equipment will be trained in accordance with this written program, depending upon the nature of their use of such equipment. For example, those who are required to use APR's for protection against recognized workplace health hazards will be initially and annually thereafter trained in the full program as it is written herein. Those who might wear filtering facepieces for voluntary purposes will be trained in accordance with the elements of section 4.4 of the written Personal Protective Equipment program. Other respiratory protection training classes will be held as they are needed, based upon program evaluations as per the below.

5.10 MAINTAINING RESPIRATOR EFFECTIVENESS

1. Monitoring Work Area Conditions

Appropriate surveillance by both respirator wearers and their supervisors shall be maintained regarding work area conditions where respiratory protection is utilized, as well as the degree of employee exposure and/or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness, the employer shall reevaluate the continued effectiveness of the respirator. The respirator wearer shall leave the respirator use area when the following conditions are met or needed:

- To wash their faces and respirator facepieces as necessary to prevent eye or skin irritation associated with respirator use;
- If vapor or gas breakthrough is detected, if there is a change in breathing resistance, or leakage of the facepiece;
- To replace the filter, cartridge or canister elements of the respirator.

5.11 RESPIRATOR CLEANING, MAINTENANCE, STORAGE & INSPECTION

While all respirators must be regularly cleaned and maintained to achieve optimal protection, all Hamilton College respirators are issued for the exclusive use of a single employee, and they are charged with cleaning them as often as is necessary. Weekly or monthly cleaning is usually adequate but more frequent cleaning may be necessary as their frequency of use increases. The need for respirator decontamination should also be considered when determining the frequency of cleaning.

1. Cleaning and Disinfecting

When respirators are in active use (on a particular day), respirator wipes may be used to cleanse the outer/inner portions of the device, and/or to remove miscellaneous contamination. However, in between uses (different days), the following cleansing/disinfection routine shall be followed:

- Remove cartridges/filters/canisters. Disassemble facepiece by removing speaking diaphragms, and remove cartridge/filter/canister holders. Discard any defective parts.
- Wash the respirator and all components in warm (43° C [110° 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.

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- The standard cleaning detergent used by the college also acts as a suitable disinfecting agent. However, at least 10 minutes of contact time with the detergent is required to properly disinfect the respirator and its components.
- Rinse respirator and its components thoroughly in clean, warm (43° C [110° F] maximum), preferably running water. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces may result in dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
- Components should be hand-dried with a clean lint-free cloth or air-dried.
- Reassemble facepiece.
- Test the respirator to ensure that all components work properly.

2. Storage

When not in use, the respirator and cartridges should be kept in a sealed container and stored in a clean, dry, moderate temperature, non-contaminated environment. It is especially important to keep gas and vapor cartridges in a sealed container so they do not passively adsorb gases and vapors from the storage area, thereby reducing the filter service life. Particulate filters should also be protected from dusts and dirt. If a respirator has become contaminated, cleaning it prior to storage is crucial.

3. Replacement Parts

Consult the Director of EP&S for all replacement parts and components. Respirator components from different manufacturers will void the NIOSH certification of the respirator, rendering it as inadequate for the protection against respiratory hazards.

4. Inspection Procedures and Schedules

Each respirator shall be inspected routinely before and after use. Respirators shall be inspected by the user immediately prior to each use to ensure that it is in proper working condition. After cleaning, each respirator shall be inspected to determine if it is in proper working condition and if it needs replacement of parts or repairs. Consider the following when inspecting an APR:

- Facepiece—look for dirt; cracks/tears/holes; distortion of the facepiece; and cracked, scratched, or loose fitting lenses;
- Headstraps—look for breaks or tears; loss of elasticity; broken buckles or attachments; and worn serration on head harness which might allow facepiece to slip;
- Inhalation and Exhalation Valves—look for dust particles, dirt, or detergent residue on valve and valve seat; cracks, tears, or distortion in valve material; and missing or defective valve covers;
- Filter Elements—look for proper filter for the hazard; approval designation; missing or worn gaskets; worn threads on filter and facepiece; and cracks or dents in filter housing.

5.12 RECORDKEEPING & EVALUATION OF PROGRAM EFFECTIVENESS

1. Recordkeeping

The Director of EPS&S will be principally responsible for maintaining all records regarding the Hamilton College Respiratory Protection Program, including but not limited to the following:

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- Medical prequalification documentation (in consultation with the occupational health care provider);
- Training records;
- Fit test records;
- Air monitoring records;
- Hazard assessments; and
- This written program.

2. Evaluation of Respirator Program Effectiveness

Periodic review of the effectiveness of the respirator program is essential. The Director of EPS&S will conduct periodic surveys to determine the effectiveness of the respirator program. This will include work site inspections, interviews with respirator wearers, air monitoring, and review of other records. Acceptance of respirators by the user is especially important. Users will be consulted about their acceptance of wearing respirators during annual re-training. This includes comfort, resistance to breathing, fatigue, interference with vision, interference with communications, restriction of movement, interference with job performance, and confidence in the effectiveness of the respirator to provide adequate protection. The above information can serve as an indication of the degree of protection provided by respirators and the effectiveness of the respirator program. Action shall be taken to correct any insufficiencies found in the program.

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APPENDIX A: HEALTH QUESTIONNAIRE REQUIRED BY OSHA

Appendix C to Sec. 1910.134: OSHA Respirator Medical Evaluation Questionnaire (Mandatory)

To the employer/fire district:

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/firefighter/EMS:

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. Name:	2. Today's date
3. Age (to nearest year):	4. Sex (circle one): Male Female
5. Height: _____ ft. _____ in.	6. Weight: _____ lbs.
7a. **If a Firefighter, describe your duties:	
7b. Current occupation and duties, with exposures:	# of years on this job:

Prior Job History:

Dates	Job Title & Description	Exposures	Protective Equipment

7c. Have you ever worked at a job or hobby in which you came in contact with any of the following by breathing, touching, or ingesting (swallowing)? If Yes, please check the box beside the name.

- | | | | | | |
|--|---|---|--|--|---|
| <input type="checkbox"/> Acids | <input type="checkbox"/> Carbon tetrachloride | <input type="checkbox"/> Fiberglass | <input type="checkbox"/> PCBs | <input type="checkbox"/> Talc | <input type="checkbox"/> Typical fire exposures including: fumes, particulate aldehydes, carbon monoxide, carbon dioxide, nitrogen dioxide, hydrogen chloride, hydrogen cyanide, acrolein, vol. organic compounds |
| <input type="checkbox"/> Alcohols (industrial) | <input type="checkbox"/> Chlorinated naphthalenes | <input type="checkbox"/> Halothane | <input type="checkbox"/> Perchloroethylene | <input type="checkbox"/> Toluene | |
| <input type="checkbox"/> Alkalies | <input type="checkbox"/> Chloroform | <input type="checkbox"/> Isocyanates | <input type="checkbox"/> Pesticides | <input type="checkbox"/> TDI or MDI | |
| <input type="checkbox"/> Ammonia | <input type="checkbox"/> Chloroprene | <input type="checkbox"/> Ketones | <input type="checkbox"/> Phenol | <input type="checkbox"/> Trichloroethylene | |
| <input type="checkbox"/> Arsenic | <input type="checkbox"/> Chromates | <input type="checkbox"/> Lead | <input type="checkbox"/> Phosgene | <input type="checkbox"/> Trinitrotoluene | |
| <input type="checkbox"/> Asbestos | <input type="checkbox"/> Coal dust | <input type="checkbox"/> Manganese | <input type="checkbox"/> Radiation | <input type="checkbox"/> Vinyl chloride | |
| <input type="checkbox"/> Benzene | <input type="checkbox"/> Dichlorobenzene | <input type="checkbox"/> Mercury | <input type="checkbox"/> Rock dust | <input type="checkbox"/> Welding fumes | |
| <input type="checkbox"/> Beryllium | <input type="checkbox"/> Ethylene dibromide | <input type="checkbox"/> Methylene chloride | <input type="checkbox"/> Silica powder | <input type="checkbox"/> X-rays | |
| <input type="checkbox"/> Cadmium | <input type="checkbox"/> Ethylene dichloride | <input type="checkbox"/> Nickel | <input type="checkbox"/> Solvents | <input type="checkbox"/> Loud noises | |
| | <input type="checkbox"/> PPBs | <input type="checkbox"/> Styrene | <input type="checkbox"/> Other (specify): | | |

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

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	b. Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus) (SCBA):				
12.	Have you worn a respirator (circle one):			YES	NO
13.	If “yes,” what type(s):				

Part A. Section 2. (Mandatory)—Explain yes answers in comments section below

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 <i>ever had</i> 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 <i>ever had</i> any of the following pulmonary or lung problems?						
	a. Asbestos:	YES	NO	g. Silicosis:		YES	NO
	b. Asthma:	YES	NO	h. Pneumothorax (collapsed lung):		YES	NO
	c. Chronic bronchitis:	YES	NO	i. Lung cancer:		YES	NO
	d. Emphysema:	YES	NO	j. Broken ribs:		YES	NO
	e. Pneumonia:	YES	NO	k. Any chest injuries or surgeries:		YES	NO
	f. Tuberculosis:	YES	NO	l. Any other lung problem?:		YES	NO
4.	Do you <i>currently</i> 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 up a slight hill/incline:					YES	NO
	c. Shortness of breath when walking 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 up 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

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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 <i>ever had</i> any of the following cardiovascular or heart problems?		
a. Heart attack: If Yes, when?	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 <i>ever had</i> 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 <i>currently</i> 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 <i>ever had</i> any of the following problems? (If you've never used a respirator, check the following box and go to question 9 <input type="checkbox"/>):		
a. Eye irritation:	YES	NO
b. Skin allergies or rashes:	YES	NO
c. Anxiety:	YES	NO
d. General weakness or fatigue:	YES	NO

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	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).

10.	Have you <i>ever</i> lost vision in either eye (temporarily or permanently)?	YES		NO
11.	Do you <i>currently</i> have any of the following vision problems?			
	a. Wear contact lenses:	YES		NO
	b. Wear glasses:	YES		NO
	c. Color blind:	YES		NO
	d. Any other eye or vision problem:	YES		NO
12.	Have you <i>ever had</i> an injury to your ears, including a broken ear drum?	YES		NO
13.	Do you <i>currently</i> 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 <i>ever had</i> a back injury? If Yes, when?	YES		NO
15.	Do you <i>currently</i> have any of the following musculoskeletal problems?			
	a. Weakness in any of your arms, hands, legs, or feet:	YES		NO
	b. Back pain: If Yes, when?	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 ladder carrying more than 25 pounds:	YES		NO
	j. Any other muscle or skeletal problem that interferes with using a respirator:	YES		NO

**COMMENTS
SECTION:**
