



Respirator Program

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Applies To: Faculty, Staff, Student Employees, Others

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I. Purpose

As part of a continuing effort to provide a safe and healthful workplace for University employees, this program has been developed to ensure that employees are adequately protected from air contaminants and other respiratory hazards including:

- Gas and vapor contaminants;
- Airborne particulate matter;
- Oxygen deficiency; or
- Any combination of the above.

While the proper respirator may offer suitable protection against the above hazards, a respirator must not be considered the first choice for offering protection. The primary method for controlling exposure to respiratory hazards in the workplace must be through engineering controls such as ventilation, enclosure of an operation, or substitution with less toxic materials. However, when workers may be exposed above recognized exposure limits, **respirators must be used if:**

1. Engineering controls are not feasible;
2. Engineering controls alone cannot reduce exposures to acceptable levels; **or**
3. Respirators are used as an interim measure while engineering controls are in the process of being implemented.

This program incorporates the requirements of the Occupational Safety and Health Administration's (OSHA's) Respiratory Protection Standard (29 CFR 1910.134) and serves as the University's written respiratory protection program, as required by the standard. The Occupational Health and Safety Specialist in Environmental Health and Safety is the designated Program Administrator for the University.

II. Scope

This Program covers respirator use at the University of Connecticut's Storrs-based, regional, and Law School campuses. It does not apply to UCONN's Division of Public Safety, which is responsible for its own Program Administration.

This program covers **the use of any type of respirator** by University of Connecticut employees, except as previously stated, including:

1. **Mandatory use:** when a respirator is necessary to protect the health of an employee from exposure to air contaminants above an exposure limit or otherwise necessary to protect employee health; or when an employee is directed to wear a respirator as a condition of employment.
2. **Voluntary use:** when a respirator is worn for comfort or other reasons by an

employee, though conditions do not exist (as described in item 1, above) that mandate its use.

3. **Use of Dust Masks:** filtering facepiece respirators, otherwise known as dust masks or N95s, are considered respirators by OSHA and are covered by this program and by the OSHA Respiratory Protection Standard.

III. Policy Statement

As stated in the University's [Health and Safety Policy](#), the University of Connecticut is committed to providing a healthful and safe environment for all activities under its jurisdiction and complying with federal and state health and safety standards. Faculty, staff and students all share responsibility for minimizing their exposure to airborne hazards and to comply with the requirements of this Respiratory Protection Program.

IV. Enforcement

Violations of this program may result in appropriate disciplinary measures in accordance with University Laws and By-Laws, General Rules of Conduct for All University Employees, applicable collective bargaining agreements, and the University Of Connecticut Student Code of Conduct.

V. Respirator Selection

- A. Only respirators certified by the National Institute for Occupational Safety and Health (NIOSH) may be used.
- B. Respirators must be selected on the basis of the potential hazard to which the worker is exposed. The following factors must be considered in making this selection.
 1. The identity of the substance(s) and environment for which protection is needed;
 2. The physical state of the contaminant (dust, mist, vapor, etc., or a combination thereof);
 3. The permissible exposure limit or toxicity of the substance;
 4. Exposure assessments indicating the concentration likely to be encountered;
 5. The [protection factor](#) listed for the respirator type;
 6. The possibility of oxygen deficiency or other environments that are immediately dangerous to life or health (IDLH); **and**
 7. Any limitations or restrictions applicable to the types of respirators being considered which could make them unsafe in the environment involved.

C. Assessments to determine or predict the potential exposure concentrations and proper respirator selection should be made in consultation with Environmental Health and Safety.

D. Respirator Types and Acceptable Use Criteria

1. **Air-Purifying Respirators (APRs)** cleanse contaminated air as it passes through an air-purifying device (such as a filter, cartridge, or canister). The respirator will not offer protection unless the proper air-purifying device made for specific air contaminants (such as gases, vapors, dusts, mists and fumes) is used. Contact Environmental Health and Safety for assistance in selecting the proper air-purifying device.

APRs provide no protection against oxygen deficiency or other atmospheres that are immediately dangerous to life or health (IDLH)--in other words, atmospheres that would not allow the wearer to escape if the respirator were to fail. Air-purifying devices used for protection against gases and vapors must be equipped with end-of-service-life indicators (ESLIs). Otherwise, as with organic vapor cartridges, a change-out schedule must be implemented to ensure continued effectiveness of the respirator. [Appendix E](#) provides additional information on change-out schedules.

- a. *Dust Masks* are APRs with the facepiece serving as the filtering medium. These may or may not contain exhalation valves built into the facepiece.
 - b. *Full-facepiece and half-mask negative pressure respirators* use a variety of air-purifying devices to absorb, adsorb, or filter contaminants from the air. A full-facepiece respirator provides protection from eye irritants and offers more protection from air contaminants than a half-mask respirator.
 - c. *Powered Air-Purifying Respirators (PAPR)* are positive pressure devices that use a blower to force ambient air through an air-purifying device, and then to the wearer's respirator facepiece, hood, or helmet. A PAPR is the most protective of the APRs because the positively pressurized respirator prevents inward leakage of contaminants into the facepiece, hood, or helmet.
2. **Atmosphere-Supplying Respirators** provide a supply of breathable air to the wearer from an uncontaminated source, independent of the ambient air. The OSHA Respiratory Protection standard requires employers to provide workers who are wearing atmosphere-supplying respirators with breathing air of high purity. **The checklist in [Appendix A](#) should be used for this purpose.** Two types of atmosphere-supplying respirators are:
 - a. *Air-line Respirators* supply the wearer with breathable air through a hose

from a compressor or compressed air cylinder. These respirators are equipped with half- or full- facepieces, hoods, helmets, or loose-fitting facepieces. Air-line respirators use one of three airflow control devices to regulate the airflow: 1) continuous-flow; 2) pressure-demand; or 3) demand. In a continuous-flow respirator, a constant but adjustable flow of air is delivered to the respirator that maintains a slight positive pressure inside the respirator and thus prevents inward leakage. This type of equipment is best suited for use with an air compressor. When compressed air cylinders are used as the air source and air must be conserved, the pressure-demand type respirator is preferred. Pressure-demand maintains a slight positive pressure while supplying air at the demand of the wearer. A demand type respirator is not recommended since it does not maintain a positive pressure within the facepiece. Air-line respirators may not be used in IDLH atmospheres.

- b. *Self-contained Breathing Apparatus (SCBA)* provides a breathing air source that is carried by the user, offering greater mobility to the wearer than air-line respirators. SCBAs may be used in IDLH atmospheres provided that they offer a minimum service life of 30 minutes. This is the equipment of choice for emergency situations. SCBA respirators with less than 30 minutes of service life may be used to escape from IDLH atmospheres provided that they are NIOSH-certified for escape from the atmosphere in which they will be used. An SCBA's advantage over an air-line respirator is that it can be used at greater distances from an air source. Disadvantages are their weight, bulk, and the time limit associated with each air supply unit. Additionally, higher levels of operator training are required to ensure safe use.

3. **Combination Respirators**

- a. *SCBA/Air-line* combination units provide SCBA back-up if the primary air-line supply fails. These respirators may be used in IDLH atmospheres and are good for situations that require extended work periods beyond the time provided by an SCBA alone.
- b. *Air-Purifying/Air-line* combination units provide an APR back-up if the air supply fails. These respirators may not be used in IDLH atmospheres. Furthermore, they may only be used in atmospheres for which the air-purifying device is approved.

- 4. **Surgical Masks** are not for protection against inhalation of harmful chemicals or airborne aerosols (such as dusts, mist, fumes or biological contaminants) and are not considered respiratory protection.

VI. Voluntary Use of Respirators

On occasion employees may desire to use dust masks voluntarily, though conditions do not exist that mandate their use. In such cases, medical evaluations and fit testing are not required and the employer may provide dust masks at the request of the employees or permit them to use their own if:

- the use of the dust mask is not required by the employer;
- the dust mask is used for comfort purposes only and not to protect the health of the employee;
- the employer determines that such dust mask use will not in itself create a hazard; AND
- pertinent selection, maintenance, and training requirements outlined in this program are met.

A. Voluntary use of dust masks

When dust masks will be used voluntarily, **supervisors must ensure that:**

1. Employees **receive Voluntary Use of Filtering Facepiece Respirators Training** (see Section X for further information)
2. The **respirator maintenance and care provisions** of this program are followed.

B. Voluntary use of all other respirators

If other types of respirators will be used voluntarily, supervisors must ensure that employees are medically evaluated, trained, and fit-tested annually, as outlined below.

VII. Medical Evaluations

An initial medical evaluation must be conducted by a physician or other licensed health care professional (PLHCP) before an employee is assigned tasks requiring the use of a respirator, or before an employee is allowed to voluntarily use a respirator. Voluntary use of dust masks does not require this medical evaluation. The PLHCP will make a written determination of whether the employee is able to use a respirator. The medical evaluation may be conducted by means of a physical examination or by a PLHCP's review of the Medical Evaluation Questionnaire provided in [Appendix C](#), completed by the employee. Upon review of the questionnaire, the PLHCP may request to conduct a follow-up physical examination of the employee at his/her discretion.

- A. Supervisors are responsible for ensuring that their employees receive medical evaluations prior to assigning them a respirator.** Departments are responsible for making arrangements with the medical provider. Medical questionnaires must be

administered confidentially during the employee's normal working hours or at a time and place convenient to the employee. The medical questionnaire must be administered in a manner that ensures that the employee understands its content. Employees must be given the opportunity to discuss the questionnaire or physical examination results with the PLHCP.

1. The procedures for submitting a medical questionnaire for faculty and staff can be found [here](#).
 2. The procedures for submitting a medical questionnaire for student employees can be found [here](#).
- B.** Medical evaluations must be conducted every three years for individuals who exclusively wear filtering facepiece respirators and **annually** for wearers of all other types of respirators. In addition, medical evaluations must be conducted whenever any of the following occurs:
1. An employee reports medical signs or symptoms that are related to his/her ability to use a respirator.
 2. A PLHCP, supervisor, or Environmental Health and Safety inform the employee that the employee needs to be reevaluated.
 3. Information from the respiratory protection program, including observations made during fit-testing and program evaluation, indicates a need for employee reevaluation.
 4. A change occurs in the workplace that places a greater physiological burden on an employee.
- C.** The PLHCP will incorporate the requirements of [Appendix B](#) of this program in conducting a medical evaluation or examination of an employee.
- D.** Student Health Services, who conducts student employee medical evaluations, will submit the PLHCP's written recommendation to the affected employee and Environmental Health and Safety. All other medical service providers will submit written recommendations to the affected employee. Employees, or their supervisors, must submit copies of medical evaluations to Environmental Health and Safety. The written recommendation will include the following:
1. Any recommended limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which a respirator will be used, including whether or not the employee is medically able to use a respirator;

2. The need, if any, for follow-up medical examinations; and
3. A statement that the PLHCP has provided the employee and his/her supervisor with a copy of the PLHCP's written recommendation.

VIII. Medical Records

An accurate record for each employee subject to medical surveillance must be established and maintained. The record must include at least the following information:

1. The name of the employee;
2. The PLHCP's written recommendation;
3. A copy of the employee's medical evaluation results, including the Medical Evaluation Questionnaire, and results of any tests or follow-up physical examinations; and
4. Any employee medical complaints related to exposure to any respiratory hazards.

The University is responsible for ensuring that this record is maintained for the duration of employment plus thirty (30) years, in accordance with 29 CFR 1910.1020. Employees must give copies of medical evaluations to supervisors, who in turn, must maintain copies of medical evaluations in personnel files. Environmental Health & Safety will maintain only the current copy of the employee's name and the PLHCP's written recommendation, for training and fit test purposes. In addition, Student Health Services and Environmental Health and Safety will maintain a current copy of the University's Respirator Program.

IX. Training

A. General Requirements

All employees must receive training prior to using any respirator, including dust masks. For users of air purifying respirators (APRs), training will be conducted by the Program Administrator in Environmental Health and Safety or his/her authorized designee. Departments must make special arrangements for SCBA and Air-line Respirator users to receive training from a qualified instructor. Departments may contact EHS for referrals.

Supervisors should arrange for training with EHS **after** employees have been medically evaluated and written approval to wear a respirator has been received from a PLHCP. Preparatory instructions for respirator training can be found in [Appendix D](#).

Supervisors must ensure that employees receive training as follows:

1. **Initially**—prior to being assigned a respirator.
2. **Annually**
3. **Whenever retraining appears necessary because:**
 - a. Changes in the workplace or the type of respirator render the previous training obsolete.
 - b. Inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the necessary understanding or skill.
 - c. Any other situation arises in which retraining appears necessary to ensure safe respirator use.

B. Training Requirements for Voluntary Use of Dust Masks (Filtering Facepiece Respirators)

Employees who **voluntarily** wear dust masks must be scheduled for an awareness level of training conducted by their supervisor using the Voluntary Use of Filtering Facepiece Respirators training record in [Appendix F](#), completing the online training program, or by attending a class provided by the Program Administrator in Environmental Health and Safety or his/her authorized designee. This training is only required once. If a supervisor chooses to provide this awareness training on his/her own, the training record in Appendix F, which incorporates the necessary OSHA information, must be completed and signed by both the affected employee and the training provider, and must be sent to the Program Administrator at Unit 4097 or faxed to 860-486-1106.

X. Respirator Fit

A properly fitting respirator is essential if employees are to receive adequate protection. **Supervisors must ensure that each employee is *Fit Tested* to his/her assigned respirator prior to its first use.** In addition, *User Seal Checks* must be performed by the employee prior to each use of the respirator. Procedures for *Fit Tests* and *User Seal Checks* and other considerations to ensure fit are as follow:

- A. Fit Tests** --This section applies to all tight-fitting respirators, excluding dust masks used voluntarily. It also does not apply to helmets, or loose-fitting hoods, or to escape-only respirators.
1. Employees must pass a respirator fit test **prior to using a respirator and annually thereafter.**
 2. The Program Administrator in Environmental Health and Safety or his/her authorized designee will perform these tests using the Qualitative Fit Test

method.

(Note: For SCBA and Air-Line respirators used in demand mode, or Full-face negative pressure respirators used in atmospheres more than ten times the OSHA Permissible Exposure Limit, Departments must make special arrangements for fit testing using the Quantitative Fit Test method with the respirator manufacturer or distributor, or other qualified fit testing agency.)

3. Additional fit testing is required whenever an employee:
 - incurs a weight change of 20 lbs or more;
 - has significant dental changes; or
 - has any other change in facial conditions that may interfere with facepiece sealing (i.e., broken facial bone, scarring, surgery, etc.).
4. Fit tests will be conducted with the same make, model, and size respirator that the employee will use on the job.
5. Employees with beards or other facial hair that interfere with a tight facepiece seal, or valve function, will not be allowed to use tight-fitting respirators, and **will not be fit tested**. More than one day's growth of facial hair is not permitted with negative-pressure respirator use. Respiratory protection for employees with beards may be attained by using a powered air-purifying hood.

B. User Seal Checks

Prior to each use, a User Seal Check must be performed by the employee to ensure an adequate seal is achieved each time the respirator is worn. **User Seal Checks are not substitutes for Fit Tests. User Seal Checks must be conducted as follows:**

For Elastomeric Respirators:

1. The respirator facepiece, straps, and headband must be adjusted and secured properly. Refer to the manufacturer's instructions for fitting and user seal checks.
2. *Positive pressure check*—Close off the exhalation valve and exhale gently into the facepiece. If a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the facepiece seal, the seal is satisfactory.
3. *Negative pressure check*—Close off the inlet opening of the cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s)—a thin latex or nitrile glove will help to close off the openings. Inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. If the facepiece remains collapsed with no inward leakage of air, the seal is satisfactory.

If leakage is detected, steps 1 through 3 must be repeated until a proper seal is attained.

For Filtering Facepiece Respirators (dust masks):

1. The respirator and straps must be adjusted and secured properly. Refer to manufacturer's instructions for fitting and user seal checks.
2. For masks without exhalation valves, place both hands completely over mask and exhale. The respirator should bulge slightly. Check for leaks around seal.
3. For masks with exhalation valves, place both hands over respirator and inhale. The respirator should collapse slightly. Check for leaks around seal.

C. Other Considerations for Proper Fit

1. Employees who must wear corrective glasses, goggles, or other protective equipment must do so in a manner that does not interfere with the face-to-facepiece seal or valve function of the respirator.
2. Employees using tight-fitting respirators must have no condition, such as facial hair, that would interfere with the face-to-facepiece seal or valve function of the respirator. Moderate stubble or one day's growth of facial hair is considered excessive and would preclude the use of a tight-fitting respirator.

XI. Respirator Maintenance And Care

A. Cleaning and Disinfecting

1. Each employee must be provided with a respirator that is clean, sanitary, and in good operating condition.
2. Respirators (except dust masks) must be cleaned and disinfected as follows:
 - a. As often as necessary when issued for the exclusive use of one employee.
 - b. Before being worn by different individuals.
 - c. After each use for emergency use respirators.
 - d. After each use for respirators used for fit testing and training.
3. Respirators (except dust masks) must be cleaned using the following procedures, or as recommended by the manufacturer:
 - a. Remove filters or cartridges. Disassemble facepieces by removing components as recommended by the manufacturer. Discard or repair any defective parts.
 - b. Wash components in warm (110°F max.) water with a disinfecting cleaner recommended by the manufacturer. Use a nylon brush, if needed, to help remove dirt.

- c. Rinse components **thoroughly** in clean, warm, preferably running water. Drain.
- d. Hand dry components with a clean lint-free cloth or air dry.
- e. Reassemble facepiece, replacing filters and cartridges where necessary.
- f. Test the respirator to ensure that all components work properly.

B. Storage

1. Respirators must be stored to protect them from damage from the elements and from becoming deformed.
2. Emergency respirators must be stored as follows:
 - a. To be accessible to the work area.
 - b. In compartments marked as such.
 - c. In accordance with manufacturer's recommendations.

C. Inspections

All respirator inspections will include checking respirator function, tightness of connections, and condition of the parts.

1. Routine-use respirators must be inspected before each use and during routine cleaning by the user.
2. Disposable dust masks must be inspected prior to initial use.
3. SCBAs and respirators maintained for emergency situations must be inspected monthly and checked for proper function before and after each use. SCBA inspections will also include checking that cylinders are fully charged and that regulators and warning devices function properly. Inspections for **SCBA and respirators maintained for emergency situations must be certified and documented** by tagging the respirator or by maintaining inspection reports. The documentation must include the date of inspection, name of person who conducted the inspection, the findings, any required remedial actions and a serial number or other means of identifying the respirator.
4. Emergency escape-only respirators, as opposed to respirators maintained for emergency situations, must be inspected before being carried into the workplace for use.
5. Supervisors must periodically inspect respirators to ensure that they are kept clean, stored properly, and in good working condition.
6. Employees must report any malfunction of a respirator or damaged respirator parts to his/her supervisor.

7. Maintenance of respirators must be conducted in accordance with manufacturer's instructions.
8. Supervisors must take any worn-out or damaged respirator or respirator parts out of service immediately and have them replaced with NIOSH-approved parts or repaired by trained personnel. NOTE: Any reducing and admission valves, regulators, and alarms must be adjusted or repaired by the manufacturer or a technician trained by the manufacturer.

XII. Respirator Use in IDLH Atmospheres

University Fire Department personnel are the only employees authorized to enter IDLH atmospheres unless otherwise approved by Environmental Health and Safety. Whenever respirators are used in IDLH atmospheres, the following must be ensured:

1. The appropriate number of standby personnel is deployed.
2. Standby personnel and employees in the IDLH environment maintain communication.
3. Standby personnel are properly trained, equipped, and prepared.
4. A designated representative is notified before the standby personnel enter an IDLH atmosphere to provide emergency rescue.

Standby personnel are equipped with a pressure-demand or other positive pressure SCBA, or a positive pressure supplied air respirator with an escape SCBA, and appropriate retrieval equipment or other means for rescue.

XIII. Program Evaluation

The Program Administrator, or his/her designee, in Environmental Health and Safety will conduct periodic workplace evaluations to ensure that this program is being effectively implemented. The evaluations will include site inspections, a review of records, and regular consultations with employees who use respirators and their supervisors. The evaluations may also include air monitoring.

A report identifying problems will be forwarded to the employee's supervisor, and will include recommended corrective action and target dates for the implementation of those corrections.

APPENDIX A

ATMOSPHERE-SUPPLYING RESPIRATORS

CHECKLIST FOR BREATHING AIR QUALITY AND USE

Check that at your facility:

General

- Compressed breathing air meets the requirements for Grade D breathing air.
- Compressed oxygen is not used in respirators that have previously used compressed air.
- Oxygen concentrations greater than 23.5 percent are used only in equipment designed for oxygen service or distribution.
- Breathing air couplings are incompatible with outlets for other gas systems.
- Breathing gas containers are marked with appropriate NIOSH certification.

Breathing Air Cylinders

- Cylinders are tested and maintained according to DOT 49 CFR Part 173 and 178.
- A certificate of analysis for breathing air has been obtained from the supplier.
- Moisture content in the cylinder does not exceed a dew point of -50°F at 1 atmosphere pressure.

Compressors

- Are constructed and situated to prevent contaminated air from getting into the system.
- Are set up to minimize the moisture content.
- Are equipped with in-line air-purifying sorbent beds and/or filters that are maintained or replaced following manufacturer's instructions.
- Are tagged with information on the most recent change date of the filter and an authorizing signature.
- Carbon monoxide does not exceed 10 ppm in the breathing air from compressors that are not oil-lubricated.
- High-temperature and carbon monoxide alarms are used on oil-lubricated compressors, or that the air is monitored often enough to ensure that carbon monoxide does not exceed 10 ppm if only a high-temperature alarm is used.

APPENDIX B

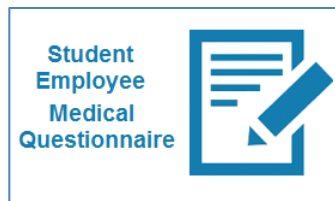
OSHA Respiratory Protection Standard

Medical Evaluation Requirements

[29 CFR 1910.134 –section e](#)

APPENDIX C

Medical Evaluation Questionnaires



APPENDIX D

Preparatory Instructions for Respirator Training

Step 1 Complete and submit a Medical Evaluation Questionnaire:

Students – Questionnaire and instructions can be found [here](#).

Faculty or Staff – Questionnaire and instructions can be found [here](#).

Step 2 Obtain a Written Approval to wear a respirator from the physician.

Step 3 Once approval has been given, [register online](#) for training and fit testing at Environmental Health and Safety (EHS).

Step 4 Come prepared on the day of training and fit testing:

- Bring a copy of the written medical approval
- If attending re-training, bring your respirator to class.
- If newly assigned to wear a filtering facepiece respirator (dust mask), bring one to class.
- All men must be **clean shaven** on the day of the training and fit testing. OSHA considers more than one day's growth of stubble as unacceptable. Small beards and/or moustaches may be permitted if they do not interfere with the facial seal or functioning of valves in the respirator.
- Refrain from eating, drinking or smoking 15 minutes before attending training.

Notes:

If newly assigned to wear a ½ face elastomeric respirator, a sample will be provided in class until a size is determined.

Filtering facepiece respirators require medical evaluations every 3 years, all other respirators require medical evaluations annually.

APPENDIX E

Change-out Schedules for Respirator Cartridges

Introduction

Use of air-purifying respirators for protection against gases or vapors requires an end-of-service-life indicator (ESLI) on the cartridge or canister. In the absence of an ESLI, a change-out schedule must be implemented based on objective information to ensure that the canisters or cartridges are changed before the end of their service life. OSHA does not allow reliance on the employee’s ability to detect a contaminant in the mask (e.g., via odor or irritation) as indication of the need for replacement. Various methods can be used to determine these schedules including manufacturers’ objective data, experimental methods, and mathematical predictive modeling. In addition, there are “Rules of Thumb” that were published by the American Industrial Hygiene Association for estimating organic vapor cartridge service life:

- If a chemical’s boiling point is greater than 70°C and the concentration is less than 200ppm, you can expect a cartridge’s service life to be 8 hours at a normal work rate.
- Cartridges used for materials with boiling points less than or equal to 65°C should not be kept beyond one work shift.
- Service life of a cartridge is inversely proportional to work rate.
- Reducing the concentration by a factor of ten will increase the service life of the cartridge by a factor of five.
- Humidity above 85% will reduce service life of the cartridge by 50%

Note: These generalizations should only be used in conjunction with other methods for predicting service life.

Site-Specific Change-out Schedule

Department:	Respirator Type/Cartridge:
Applicable Chemicals:	
Recommended Schedule:	
Respirator Program Administrator:	Date:

APPENDIX F

Voluntary Use of Filtering Facepiece Respirators

