LOYOLA UNIVERSITY CHICAGO

RESPIRATORY PROTECTION PROGRAM

JANUARY 2024

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LOYOLA UNIVERSITY CHICAGO
RESPIRATORY PROTECTION PROGRAM

1.0 INTRODUCTION

1.1 Company Policy

It is the policy of Loyola University Chicago to provide employees with a safe and healthy working environment. Loyola University has developed this Respiratory Protection Program (RPP) in accordance with the United States Occupational Safety and Health Administration (OSHA) standard 29 CFR 1910.134. This program addresses the control of employee exposures to airborne contaminants. OSHA has established permissible exposure limits (PELs) for chemicals. Employees cannot be exposed to a chemical whose concentration level is greater than the PEL without proper respiratory protection. In an effort to reduce employee exposure, attempts must be made to reduce exposure to acceptable levels through the use of administrative and engineering controls. These shall be the first steps in exposure prevention and control.

Administrative controls include, but are not limited to, the following:

- Written respiratory protection plan
- Employee training
- Medical surveillance
- Recordkeeping
- Written Standard Operating Procedures (SOPs)
- Limiting access to hazardous areas

Engineering controls include, but are not limited to, the following:

- Putting SOPs into practice
- Using good work practices
- Selection and use of appropriate equipment and supplies
- Substitution with a less toxic material
- Change in process to minimize contact with hazardous chemicals
- Isolation or enclosure of a process or work operation
- Wet methods to reduce the generation of dust, when applicable
- General dilution ventilation
- Local exhaust, including the use of chemical fume hoods or other types of specialized ventilation systems
- Good housekeeping practices
- Enforcement of all work practices and the use of SOP's.

Respirators and other personal protective equipment may be used where engineering controls are not feasible or cannot reduce exposure to acceptable levels, or while engineering controls are being installed. The need for a respirator is dependent upon the type of operation and the nature and quantity of the materials in use. This must be assessed on a case-by-case basis. Employees shall utilize respirators provided by Loyola University Chicago only for the purpose they are intended and in a manner which complies with all Loyola University's policies and applicable regulations. Loyola University Chicago shall provide respirators, training, and medical evaluations at no cost to the employee.

This program does not apply to contractors as they are responsible for providing their own respiratory protection programs and respiratory protective equipment. (See Section 2.7 for additional information)

1.2 Purpose

The purpose of the Loyola University Chicago Respiratory Protection Program is to protect employees from inhalation hazards where effective engineering controls have not adequately reduced the risk or level of exposure. This task shall be completed by establishing and maintaining a program that will ensure compliance with all applicable regulations concerning the selection, use, and maintenance of respirators.

1.3 Objectives

The objectives of the RPP include:

- To ensure that respiratory protective equipment is utilized only when effective administrative and/or engineering controls are not feasible; or while such controls are being implemented.
- To ensure that the correct type of respiratory protective equipment is selected for each application.
- To ensure that respiratory protective equipment is properly maintained.
- To ensure that respiratory protective equipment properly fits the user.
- To ensure that users of respiratory protective equipment are adequately trained in the care, use and limitation of the devices.

2.0 RESPONSIBILITIES

2.1 Loyola University Chicago

As stated in the OSHA Act of 1970, typically referred to as the General Duty Clause, every employer is responsible for providing its employees with a safe and healthful work environment. Specifically, Section 5(a)(1) states, each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees; (2) shall comply with occupational safety and health standards promulgated under this Act.

Every employee has a specific responsibility under the Act as well. Section 5(b) states each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct. In short, employers must protect employees from any serious hazard once they're aware of it and each employee must follow all the OSHA rules and regulations.

The employer is specifically responsible for the establishment and maintenance of a respiratory protection program in accordance with 29 CFR 1910.134 when respirators are necessary to protect the health of the employee. This is done through the Loyola University Chicago Occupational Health and Safety office.

2.2 Occupational Health and Safety Office

The Occupational Health and Safety Office of the Facilities Management Division shall be responsible for establishing and maintaining a respiratory protection program consistent with the goal of protecting Loyola University Chicago personnel. The Occupational Health and Safety Office will implement and maintain a Respiratory Protection Program which is designed to ensure respirators are properly selected, used, and maintained by personnel while meeting federal regulatory standards (29 CFR 1910.134) and industry accepted standards (ANSI Z88.2 - 2015).

The Occupational Health and Safety office shall also be responsible for evaluating those tasks or procedures for which respiratory protection is believed to be necessary by determining the degree of hazard posed by the potential exposure and by determining whether engineering or administrative controls are feasible. If it is determined that respiratory protection is necessary, the Occupational Health and Safety office shall specify which respiratory protection device is to be used for each task or procedure.

Additionally, the Occupational Health and Safety office shall be responsible for providing training to Loyola University Chicago personnel in the selection and use of respiratory protective devices, shall conduct qualitative and/or quantitative fit testing, and shall issue necessary protective devices. This training may be conducted in-house or by a qualified outside party.

2.3 Director of Occupational Health and Safety

The Director of Occupational Health and Safety or designee shall act as the program administrator for the RPP. This person shall see that all responsibilities of the program are carried out.

The Director of Occupational Health and Safety or designee shall be responsible for the development, implementation, and administration of the RPP. These responsibilities include, but are not limited to, the following:

- Reviewing and updating, as needed, the respiratory protection written program.
- Conducting exposure and health hazard evaluations of the Loyola University work environment.
- Procedures for selecting respirators for use in the workplace.
- Approving respiratory protection equipment for Loyola University employees.
- Working in conjunction with the Department of Human Resources (HR) to ensure required medical evaluations of employees required to use respirators. (See Section 2.4)
- Providing instruction to personnel on the proper use, maintenance, and storage of respirators including procedures for use in reasonably foreseeable emergency situations.
- Procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators.
- Providing a fit testing program for respirator wearers.
- Maintaining annual fit testing and required training or refresher training records.
- Procedures for regularly evaluating the overall effectiveness of the Respiratory Protection Program.

2.4 Human Resources (HR)

When applicable, the Department of Human Resources (HR) is charged with the overall responsibility for monitoring medical evaluations and any other medical surveillance procedures. Additionally, HR shall be responsible for reviewing the overall health status of all personnel who may be required to wear respiratory protective equipment in the completion of their assigned tasks. HR will report employee health status to

the Occupational Health and Safety office only if and when it pertains to respirator use and without divulging any confidential information.

2.5 Supervisor

Supervisors are to be cognizant of the RPP requirements. They shall be responsible for the health and safety of their subordinates and themselves. These responsibilities include, but are not limited to, the following:

- Ensure each employee under his or her supervision using a respirator has received an annual fit test, medical evaluation, and appropriate training in respirator use.
- Ensure the availability of appropriate respirators and accessories, provide adequate storage facilities, and encourage proper respirator equipment cleaning and maintenance.
- Be aware of tasks requiring the use of respiratory protection and ensure all employees engaged in such work always use the appropriate respirators at all times.
- Survey work area conditions and degree of employee exposure or stress. When there is a change in work areas conditions or degree of employee exposure or stress that may affect respirator effectiveness, the supervisor shall reevaluate the continued effectiveness of the respirator.

Each supervisor shall identify and notify the Occupational Health and Safety office of tasks/procedures which they believe may require exposure/health assessments to determine if individuals need to use respiratory protection. If it is determined by the Occupational Health and Safety office that respiratory protection is necessary, the Occupational Health and Safety office shall specify which respiratory protection device is to be used for each task or procedure.

2.6 Respirator Wearers

It is the responsibility of each respirator wearer to comply with all aspects of the RPP. Such responsibilities include, but are not limited to the following:

- Wear his/her respirator when and where required and in the manner trained.
- Report any malfunctions of the respirator to his/her supervisor immediately.
- Guard against mechanical damage to the respirator, clean the respirator as instructed, and store the respirator in a clean, sanitary location.
- Notify supervisor of any health or other changes that might affect the safe use of a respirator.

2.7 Others

Contractors are required to develop and implement a respiratory protection program for their employees who must enter or work in areas where exposure to hazardous materials cannot be controlled or avoided through the use of administrative or engineering controls. The contractor's program must meet OSHA regulations as well as Loyola University Chicago Respiratory Protection Program requirements at a minimum. All contractor programs shall be submitted to Loyola University Chicago for review prior to use of respirators by the contractor at Loyola University Chicago facilities. Proof of an annual fit test, medical clearance, and proof of training may be required upon request.

Health, safety, medical, and industrial hygiene consultants shall be utilized to support the Respiratory Protection Program, as necessary. Consultants may be utilized to provide independent data collection, assist in training programs, and/or to assist in compliance audits or other duties, as necessary.

3.0 EXPOSURE AND HEALTH ASSESSMENTS

The Occupational Health and Safety office, a competent person, or qualified consultant will perform initial and periodic exposure monitoring in areas requiring or believed to require the use of respiratory protection. The frequency of periodic monitoring will be based upon applicable regulations, recommendation of a competent person, recommendation of a qualified consultant, and/or the judgment of the Occupational Health and Safety office.

3.1 Assessment of Work Areas

Before the selection and assignment of a respirator, an industrial hygienist or a competent person shall perform a hazard evaluation of the task that may require respiratory protection. The evaluation shall include the nature of the hazard, expected or actual levels of exposure, and the length of time the respiratory protection is required.

Whenever possible, air contaminants shall be controlled by accepted engineering control measures (e.g. enclosure, ventilation, wet methods, substitution of less toxic materials, etc.). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used.

Any task, procedure, or product shall be re-evaluated any time there is a change in the nature of the job, procedure, or product. An employee complaint will also trigger a review of a task, procedure, or product. A review of the real and/or potential exposures shall be made at least annually to determine if respiratory protection continues to be required.

3.2 Medical Evaluation

Medical surveillance of employees shall be instituted to ensure that employees are capable of safely working with respiratory protection without health risk and to monitor the continued health of the employee.

Employees who require medical surveillance include the following:

- Those exposed at or above the OSHA PEL
- Those required to wear a respirator for 30 days or more during a year
- Those issued a negative pressure respirator

When an examination is necessary, the examination shall be scheduled on company time during normal working hours. Physicals shall be provided at no cost and without loss of pay to the employee.

Examinations shall be conducted by a licensed health care provider or physician contracted by the university with the ability to comply with OSHA standards regarding respiratory examinations.

Specific medical tests and procedures will be determined by the Occupational Health Physician and will be in accordance with OSHA medical surveillance requirements and/or NIOSH recommendations. The Medical Questionnaires required by OSHA are found in Appendix C to 1910.134: OSHA Respirator Medical Evaluation Questionnaire (Mandatory).

When chest x-rays are determined as necessary by the licensed healthcare provider or physician, chest x-rays shall be interpreted by a "B Reader" who has passed a proficiency test administered by the National Institute of Occupational Safety and Health (NIOSH).

The licensed healthcare provider or physician shall make initial and subsequent annual determinations as to whether an employee can wear a respirator without physical or psychological risk. Based on the overall health of the individual and special medical tests (pulmonary function studies, EKG, etc.) as appropriate, the licensed healthcare provider or examining physician will determine whether the individual will be restricted from wearing respiratory protective equipment.

If applicable, if an employee is evaluated at an Occupational Health Center and a medical restriction is applied, employee, his/her supervisor, and Occupational Health and Safety Officer are notified of the restriction by the Occupational Health Center in consultation and cooperation with the Department of Human Resources. Respective parties are usually notified within 7 business days by email.

The licensed healthcare provider or physician shall provide a report to Loyola University Chicago. The report shall be placed in the employee's file within thirty (30) days of receipt of the report. The licensed healthcare provider or physician shall not reveal in the written opinion given to the employer, specific findings or diagnoses that are unrelated to the occupational exposure to asbestos to the employee's ability to wear respiratory protection. A copy of the report shall be made available to the employee.

4.0 SELECTION AND USE OF RESPIRATORS

4.1 Respirator Use

Only authorized personnel may utilize respiratory protection, perform tasks, or be in restricted areas which require respiratory protection. Respiratory protection is authorized and issued for the following personnel:

- Workers in areas known to have contaminant levels requiring the use of respiratory protection or in an area in which contaminant levels requiring the use of respiratory protection may be created without warning (e.g., emergency situations such as hazardous material spill responses).

- Workers performing operations documented to be hazardous to health or personnel unavoidably required to be in the immediate vicinity where similar levels of contaminants are generated or present.

- Workers in suspect areas or performing operations suspected of being hazardous to health but for which adequate sampling data has not been obtained.

4.2 Respirator Approval

All respirators shall be approved and certified by the National Institute for Occupational Safety and Health (NIOSH) under NIOSH 42 CFR Part 84.

4.3 Respirator Selection

Respiratory protective devices will be selected by the Occupational Health and Safety office in accordance with OSHA 29 CFR 1910.134 with guidance from NIOSH Respirator Selection Decision Logic, NIOSH Certified Equipment List, and/or American National Standards Institute (ANSI) "Practices for Respiratory Protection" Z88.2 - 2015.

Selection of the proper respirator(s) to be used in any work area or operation at Loyola University Chicago is made only after a determination has been made as to the real, expected and/or potential exposure of employees to harmful concentrations of contaminants in the workplace atmosphere. This evaluation will

be performed by the Occupational Health and Safety office prior to the start of any routine or non-routine tasks requiring respirators.

Air-purifying respirators shall not be used in oxygen deficient atmospheres or for hazardous chemicals without adequate warning properties.

Only full facepiece respirators shall be used in contaminant concentrations that may damage the eyes or cause eye irritation.

When appropriate, employees may choose to use a Powered Air-Purifying Respirator (PAPR) in lieu of a negative pressure respirator. A PAPR will be made available to any employee upon request and will be paid for by Loyola University Chicago. The purchase and the use of a PAPR is subject to the approval of the Occupational Health and Safety office.

Disposable dust/mist respirators may be used for nuisance particulate levels. Use of these respirators does not require a medical spirometry test or fit test but does require training and compliance with all other aspects of this Respiratory Protection Program and the written approval of an industrial hygienist.

At no time may dust masks be used for asbestos-containing materials and/or lead-based paint operations. Loyola staff should not conduct asbestos-containing materials or lead-based paint operations, but duties that may involve operations which may have asbestos-containing materials and/or lead-based paint within the vicinity which shall not be disturbed.

Assigned protection factors, current OSHA and NIOSH guidelines, and the professional judgment of an industrial hygienist (whichever is more conservative), shall be used for determining the appropriate respirator.

The following items will be considered in the selection of respirators:

- Nature of the contaminant, including skin or eye irritant, skin absorption, concentration and health effects.
- Effectiveness of the device against the substance of concern (protection factor).
- Estimated maximum concentration of the substance in the work area.
- Known limitations of the respiratory protective device.
- General environment (open shop or confined space, etc.).
- Nature of the task or procedure.
- Comfort, fit, and worker acceptance; and
- Other contaminants in the environment or potential for oxygen deficiency.

Acceptable respirators for select hazards (dependent on expected level of exposure):

Hazard	Respirator Type
Asbestos	HM APR with P100 filters FF APR with P100 filters FF Powered APR (PAPR) with P100 filters
Epoxy- or Oil-Based Paints	HM APR with organic vapor cartridges FF Powered APR (PAPR) with organic vapor cartridges

Lead-Based Paint Removal	HM APR with P100 filters FF APR with P100 filters FF Powered APR (PAPR) with P100 filters
Use of Pesticides, Herbicides, and Rodenticides	FF APR with combination particulate and pesticide cartridges FF Powered APR (PAPR) with combination particulate and pesticide cartridges
Use of Formaldehyde	FF APR with organic vapor or specific formaldehyde cartridges FF Powered APR (PAPR) with organic vapor or specific formaldehyde cartridges Type C SAR operated in pressure demand mode

KEY:
HM - Half Mask Respirator
FF - Full Face Respirator
PAPR – Powered Air-Purifying Respirator
APR – Air-Purifying Respirator

Supervisors shall contact the Occupational Health and Safety office prior to non-routine work which may expose workers to any hazardous substances or oxygen-deficient atmospheres. Examples of work which may require the use of respirators includes, but are not limited to:

- Any work involving the disturbance of asbestos-containing or suspected asbestos-containing materials
- Abrasive blasting
- Cutting or melting lead or stripping lead-based paints from surfaces
- Welding, braising or burning
- Painting, especially with epoxy or organic solvent coatings
- Using solvents, thinners or degreasers
- Any work which generates large amounts of dust
- Working in a confined space. This work requires specialized training.
- Using formaldehyde to decontaminate a space
- Bioaerosols

A review of the real and/or potential exposures shall be made at least annually to determine if respiratory protection continues to be required, and if so, whether the previously chosen respirators still provide adequate protection.

4.4 Types of Respirators

These procedures do not apply to the medical use of surgical masks. The use of surgical masks for protection of the worker against harmful levels of chemicals is not allowed by OSHA regulations. Surgical masks do not provide protection against air contaminants. They are never to be used in place of an air-purifying respirator. They are for medical use only.

Paper dust masks are illegal for work involving asbestos-containing or presumed asbestos-containing materials and for lead-based paint operations.

A. Air-Purifying Respirators (APRs)

These respirators remove air contaminants by filtering, absorbing, adsorbing, or a chemical reaction with the contaminants as they pass through the respirator canister or cartridge. This respirator is to be used only where adequate oxygen (19.5 to 23.5 percent by volume) is available. They are not to be used in atmospheres approaching its IDLH level (Immediately Dangerous to Life and Health). APRs shall never be used when dealing with unknown materials and/or concentrations.

Air-purifying respirators can be classified as follows:

1. Particulate removing respirators, which filter out dusts, fibers, fumes, and mists. These respirators may be single-use disposable respirators or respirators with replaceable filters.

2. Gas and vapor-removing respirators, which remove specific individual contaminants or a combination of contaminants by absorption, adsorption or by chemical reaction. Gas masks and chemical-cartridge respirators are examples of gas- and vapor-removing respirators.

3. Combination particulate/gas- and vapor-removing respirators, which combine the respirator characteristics of both kinds of air-purifying respirators.

B. Supplied Air Respirators (SA or SAR)- If Necessary

These respirators provide breathing air independent of the environment. Such respirators are to be used when the contaminant has insufficient odor, taste or irritating warning properties, or when the contaminant is of such high concentration or toxicity that an air-purifying respirator is inadequate. It is Loyola University Chicago's policy to use only full-face masks when using supplied-air (SA) respirators.

All SA respirators shall be supplied with Grade D breathing air in accordance with Compressed Gas Association (CGA) Commodity Specification G-7.1-1989 as specified in 29 CFR 1910.134(i)(1)

- Oxygen 19.5% - 23.5%
- Hydrocarbon $< 5 mg/m^3$
- Carbon monoxide < 10 ppm
- Carbon dioxide < 1,000 ppm
- Odor Lack of noticeable odor

Supplied-air respirators, also called air-line respirators, are classified as follows:

1. **Demand**

This respirator supplies air to the user on demand (inhalation) which creates negative pressure within the facepiece. Leakage into the facepiece will occur if there is a poor seal between the respirator and the user's face.

2. Pressure-Demand

This respirator maintains continuous positive pressure within the facepiece, thus preventing leakage of the outside environment into the facepiece.

3. Continuous Flow

This respirator maintains a continuous flow of air to the facepiece and prevents leakage of the outside environment into the facepiece.

C. Self-Contained Breathing Apparatus (SCBA) – If Necessary

This respiratory protective device is a specialized supplied air system. Generally, the tanks provide a twenty (20) to sixty (60) minute air supply. The breathing air supplied to the user is carried on the user's back. This type of respirator allows the user complete independence from fixed air source and offers the greatest degree of protection but is also the most complex. Training and practice in its use, care and maintenance is essential. This type of device shall be used in emergency situations only.

All SCBA respirators shall be supplied with Grade D breathing air in accordance with Compressed Gas Association (CGA) Commodity Specification G-7. 1.

- Oxygen 19.5% - 23.5%
- Hydrocarbon <5Mg/M3
- Carbon monoxide ≤10 ppm
- Carbon dioxide <1,000 ppm
- Odor None

D. Escape Bottle

This respiratory protective device is a backup air supply worn when using a SA respirator in an Immediately Dangerous to Life and Health (IDLH) atmosphere or when entering a confined space. This respiratory protective device is a mini-SCBA with only 5-15 minutes of breathing air. It is commonly called a "5-minute air" bottle. Work is not to be conducted using escape only SCBAs. These shall be used as backup for escape purposes only.

4.5 Identification of Respirator Cartridges and Gas Mask Canisters

Respirator cartridges and canisters are designed to protect against specific individual or a combination of potentially hazardous atmospheric contaminants and are specifically labeled and color coded to indicate the type and nature of protection they provide. Respirator users and supervisors shall be aware of the labeling and color coding of the filters and cartridges to prevent use of the wrong cartridge. The primary identifier of the contaminants against which a cartridge protects is its written description. Secondarily, cartridges may be color-coded to ease field identification.

The NIOSH approval label on the respirator will also specify the maximum concentration of contaminant(s) for which the cartridge or canister is approved. For example, a label may read:

"Do Not Wear in Atmospheres Immediately Dangerous to Life. Must Be Used in ***Areas Containing at Least 20 Percent Oxygen. Do Not Wear in Atmospheres Containing More Than One-Tenth Percent Organic Vapors by Volume. Refer to Complete Label on Respirator or Cartridge Container for Assembly, Maintenance, and Use."***

4.6 Prohibited Materials

Chemical cartridges cannot be used to protect against the following contaminants:

Acrolein	Hydrogen sulfide	Nitroglycerin
Aniline	Methanol	Nitromethane
Arsine	Methyl chloride	Ozone
Bromine	Vinyl chloride	Phosgene
Carbon monoxide	Methylene bisphenyl	Phosphine
Dimethylaniline	isocyanate	Phosphorus trichloride
Dimethyl sulfate	Nickel carbonyl	Stibine
Hydrogen cyanide	Nitrobenzene	Sulfur chloride
Hydrogen fluoride	Nitrogen oxides	Toluene diisocyanate (TDI)
Hydrogen selenide		

4.7 Warning Signs of Respirator Failure

A. Particulate Air-Purifying

When breathing difficulty is encountered with a filter respirator (due to partial clogging with increased resistance), the filter(s) must be replaced. When disposable filters must be discarded, they shall disposed of as general refuse.

B. Gas or Vapor Air-Purifying

If, when using a gas or vapor respirator (chemical cartridge or canister), any of the warning properties occur (e.g., odor, taste, eye irritation, or respiratory irritation), promptly leave the area and check the following:

- Proper face seal
- Damaged or missing respirator parts
- Saturated or inappropriate cartridge or canister

If the face seal is intact and no damaged or missing parts are found, replace the cartridge or canister. If any of the warning properties appear again, the concentration of the contaminants may have exceeded the cartridge or canister design specification. When this occurs a supplied air respirator is required.

C. Service Life of Air-Purifying Respirator Canisters and Cartridges

The canisters or cartridges of air-purifying respirators are intended to be used until filter resistance precludes further use or the chemical sorbent is expended as signified by a specific warning property (ie: odor, taste, irritation, etc.). New canisters, cartridges, or filters shall always be provided when a respirator is reissued. When in doubt about the previous use of the respirator, obtain a replacement canister or cartridge.

Check manufacturer information on the shelf life of chemical cartridges. Even when stored sealed in the original wrap, these cartridges may have an "expiration" date. Do not remove the wrap until the canister or cartridge is to be installed on the respirator assembly and used. For chemical cartridges, the date put into service is to be written on the cartridge. Check manufacturer information on the service life of the type of cartridge.

Note: When the seal is broken on the cartridge, it is considered in service. Even if it is not used in a contaminated atmosphere, breaking the seal begins its service life.

D. Supplied Air Respirator

When using an airline respirator, leave the area immediately if the compressor failure alarm is activated or if an air pressure drop is sensed. When using an SCBA, leave the area immediately if the low air pressure alarm is activated. Warning alarms for carbon monoxide (CO) must be set at or below 10 ppm. Leave the area immediately if the CO alarm is activated.

Workers using supplied air are to leave the area immediately and notify their supervisor and their co-workers if they detect an unusual odor (e.g., a petroleum-like odor) or oil in the breathing air. The same actions are to be taken if a worker develops a headache, feels faint, feels ill, light-headed or disoriented. These symptoms may indicate Carbon Monoxide (CO)-poisoning.

Note: For supplied air operations requiring a supply hose greater than one hundred fifty (150) feet in length, a gasoline fueled, or electric high-pressure air compressor system must be used. These compressors require moisture traps, dust filters, and hydrocarbon absorbents. If oil lubricated compressors are used, carbon monoxide or high-temperature alarms, or both, must be used.

5.0 RESPIRATOR TRAINING

Respirator users and their supervisors shall receive training on the contents of the Loyola University Chicago Respiratory Protection Program and their responsibilities under it. Training shall include the proper respirator selection and use, as well as the limitations of the respirator, how to ensure a proper fit before use, and how to determine when a respirator is no longer providing the protection intended.

Respirator users shall be trained in the use, maintenance, capabilities, and limitations of respirators annually or more often, as necessary. Refresher training shall be conducted, as necessary, to reinforce proper work practices and update workers on any changes in respirator technology and regulations.

Loyola University of Chicago shall provide training at no cost to the employee. This training will be conducted in-house or by a qualified outside party.

Specialized training is required for use of any supplied air or self-contained breathing apparatus. Additionally, supervisors of users of these respirators shall be knowledgeable in the proper maintenance and use of the breathing air supply system.

The training program will include the following:

1. Nature and degree of respiratory hazard(s) to which employee may be exposed, including identification of Permissible Exposure Limits (PELs).

2. Respirator selection, based on the hazard and respirator capabilities and limitations

3. Pre-use inspection, donning, doffing and use procedures

4. Fit test protocol, including hands-on practice

5. Care of the respirator (e.g., cleaning, maintenance, storage, and/or replacement)

6. Use and limitations of respirators

7. Training will also include sufficient hands-on practice to enable the employee to become confident in the use of the respirator

8. Loyola University Chicago written Respiratory Protection Program

Training will be properly documented and shall include the type and model of respirator for which the individual has been trained and fit tested. Certifications for all training classes shall be kept by the Supervisor with a copy sent to the Occupational Health & Safety office. Training records shall include names and training dates and be retained for, at minimum, the duration of employment for each staff member.

6.0 RESPIRATOR FIT TESTING

A fit test shall be used to determine the ability of each individual respirator wearer to obtain a satisfactory fit with a specific air-purifying respirator. Either quantitative or qualitative fit tests will be performed. Personnel must successfully pass the fit test before being issued a respirator.

Note: OSHA 29 CFR 1910.134 requires fit testing for tight-fitting negative and positive pressure APRs and for tight-fitting SA respirators. Fit testing is to be conducted in negative-pressure mode. This additional requirement ensures an adequate seal for escape purposes in the event of a system failure.

No Loyola University Chicago employee is permitted to wear a tight-fitting respirator in a work situation until he or she has demonstrated that an acceptable fit can be obtained.

Loyola University Chicago shall provide a medical evaluation to determine the employee's ability to use a respirator before the employee is fit tested. The employee shall be fit tested prior to the first use of the respirator and annually thereafter. Fit testing will also be required if there is a 10-pound change in weight for the wearer, dental changes, facial scaring, cosmetic surgery, or any other condition that may affect the seal.

Note: OSHA 29 CFR 1910.134 amends fit testing requirements for asbestos, lead, 13-carcinogens, vinyl chloride, inorganic arsenic, cadmium, benzene and acrylonitrile. All contaminants have been standardized to require fit testing on an annual basis only.

Fit testing will be conducted in accordance with Appendix A to 29 CFR 1910.134: Fit Testing Procedures (Mandatory). Fit testing shall be conducted by a qualified fit tester familiar with proper fit testing protocol and applicable regulations.

Successful completion of a respirator fit test will determine the manufacturer, type, model, and size of respirator for use by each individual respirator user. No other facepiece than the facepiece approved for use by that employee shall be used by that employee.

Persons failing fit testing will be provided with a different mask and retested. If the person fails all available masks, she/he cannot be assigned any duty which requires respiratory protection until appropriate respiratory protection can be found.

Fit test documentation shall be maintained by the Supervisor, with a copy sent to the Office of Health & Safety, for the duration of employment.

6.1 User Seal Check (Fit Check)

Each time a respirator is donned, the user shall perform a positive and a negative pressure fit check to verify that the respirator creates an adequate seal before entering the contaminated area. These checks are not a substitute for fit testing. Respirator users must be properly trained in the performance of these checks and understand their limitations.

Fit checks shall be performed in accordance with 29 CFR 1910.134 Appendix B-1 - User Seal Check Procedures (Mandatory). The respirator manufacturer's recommended procedures for performing a user seal check may be used instead of the positive and/or negative pressure check procedures provided that the employer demonstrates that the manufacturer's procedures are equally effective.

A. Positive Pressure Check

Applicability/Limitations: This test cannot be carried out on all respirators; however, respirators equipped with exhalation valves can be tested.

Procedure: Close off the exhalation valve or the breathing tube with the palm of the hand. Exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of any outward air leak between the sealing surface of the facepiece and the face.

B. Negative Pressure Check

Applicability/Limitations: This test cannot be carried out on all respirators; however, it can be used on facepieces of air-purifying respirators equipped with tight-fitting respirator inlet covers and on supplied-air respirators equipped with breathing tubes which can be squeezed or blocked at the inlet to prevent the passage of air.

Procedure: Close off the inlet opening of the respirator's canister(s), cartridge(s), or filter(s) with the palm of the hand or squeeze the breathing air tube or block its inlet so that it will not allow the passage of air. Inhale gently so that the face seal collapses slightly and hold your breath for at least 10 seconds. If the facepiece remains slightly collapsed and no inward leakage of air into the facepiece is detected, the tightness (fit) of the respirator is considered satisfactory.

6.2 Qualitative Fit Testing

Federal regulations (29 CFR 1910.134) require quantitative or qualitative fit tests of respirators and describe step-by-step procedures in Appendix A of the Standard. A qualitative fit test checks the subject's ability to detect a chemical introduced outside the respirator facepiece. This response is either voluntary, a specific smell or taste is detected, or involuntary, irritation to the eyes, lungs and nasal passages which typically causes coughing and/or tearing of the eyes, depending on the test chemical used. Protocol varies slightly according to test chemical. Information on the four (4) OSHA approved for qualitative testing is detailed in the following sections.

A. lsoamyl Acetate

The Isoamyl Acetate Fit Test uses an odorous vapor, commonly referred to as banana oil, to elicit a voluntary response test. It relies on the subject's ability to detect a banana-like odor while wearing the respirator. Air purifying respirators must be equipped with an organic vapor cartridge or canister for this test.

This test is limited by the wide variation of odor thresholds among individuals and the possibility of olfactory fatigue. Since it is a voluntary response test it depends upon an honest response. If the test subject cannot detect the isoamyl acetate, another acceptable test contaminant must be used.

B. Saccharin Solution Aerosol

The saccharin test is a voluntary response test. It relies on the subject's ability to detect the sweet taste of the chemical while wearing the respirator. Air purifying respirators must be equipped with high efficiency particulate air (HEPA) particulate filters (100% efficiency rating under NIOSH 42 CFR 84) for this test.

This test is limited by the wide variation of odor thresholds among individuals. Since it is a voluntary response test it depends upon an honest response. If the test subject cannot detect the saccharin solution, another acceptable test contaminant must be used.

C. BitreXTM (Denatonium benzoate)

The BitreXTM test is a voluntary response test. It relies on the subject's ability to detect the bitter taste of the chemical while wearing the respirator. Air purifying respirators must be equipped with HEPA particulate filters (100% efficiency rating under NIOSH 42 CFR 84) for this test.

This test is limited by the wide variation of odor thresholds among individuals. Since it is a voluntary response test it depends upon an honest response. If the test subject cannot detect the bitter solution, another acceptable test contaminant must be used.

D. Stannic chloride (Irritant Smoke)

The irritant smoke test is an involuntary response test. Air-purifying respirators must be equipped with a HEPA particulate filters (1 00% efficiency rating under NIOSH 42 CFR 84) filter for this test. An irritant smoke, stannic chloride, is directed from a smoke tube toward the respirator.

The irritant smoke is an irritant to the eyes, skin, and mucous membranes. It should not be introduced directly onto the skin. The test subject must keep his or her eyes closed during the testing if a full facepiece mask is not used.

Most test subjects will react to irritant smoke. However, after successful fit testing, the test subject must be exposed to the smoke to prove that they would have reacted to any leakage in their respirator. If the test subject does not react to the irritant smoke, the fit test is considered void, and another acceptable test contaminant must be used. All test subjects will be screened prior to the fit test to ensure that they can detect or will react to the chemical being used for the test.

6.3 Quantitative Fit Testing

Quantitative fit testing uses measuring instrumentation to determine the effectiveness and qualify the fit of a respirator. Fit factors are determined by comparing the particle concentration outside the respirator with the concentration inside the respirator facepiece.

Air purifying respirators must be equipped with HEPA particulate filters (Pl00 series filters under NIOSH 42 CFR 84) for this test.

An acceptable fit is achieved with a minimum fit factor greater than or equal to 100 for both half-mask and full-face unpowered APRs.

6.4 Special Problems

A. Facial Hair

No attempt shall be made to fit a respirator on an employee who has any facial hair which comes between the sealing surface of the facepiece and the face such as stubble beard growth, beard, mustache or sideburns which cross the respirator sealing surface.

No attempt shall be made to fit a respirator if the facial hair of the employee interferes with the normal function of the exhalation valve of the respirator. Any type of apparel which interferes with a satisfactory fit shall be altered or removed prior to the fit test.

B. Glasses and Eye/Face Protective Devices

Proper fitting of a respiratory protective device facepiece for individuals wearing corrective eyeglasses or goggles may not be established if temple bars or straps extend through the sealing edge of the facepiece. If an employee must wear corrective lenses with a half-mask respirator, the worker must have corrective lenses fitted into protective eyewear which does not interfere with the respirator seal. If an employee must wear corrective lenses with a full-face respirator, the worker must have corrective lenses mounted to the interior of the facepiece in a manner approved by the facepiece manufacturer.

C. Corrective Contact Lenses

Contact lenses shall not be worn while wearing any respirator. If an employee must wear corrective lenses with a half-mask respirator, the worker must have corrective lenses fitted into protective eyewear which does not interfere with the respirator seal. If an employee must wear corrective lenses with a full-face respirator, the worker must have corrective lenses mounted to the interior of the facepiece in a manner approved by the facepiece manufacturer.

6.5 Recordkeeping

Information shall include the name of test subject, date of testing, name of fit tester, test chemical and respirator selected. The respirator information shall indicate the manufacturer, model, size, and approval number. A summary of test results shall be maintained by the Supervisor, with a copy sent to the Office of Health & Safety, for the duration of employment.

7.0 MAINTENANCE, CLEANING, AND ISSUANCE OF RESPIRATORS

7.1 Maintenance and Inspection

The maintenance of respiratory protective devices involves a thorough visual inspection for cleanliness and defects (e.g., cracking rubber, deterioration of straps, defective exhalation, or inhalation valves, broken or cracked lenses, etc.). Inspection of respiratory devices shall take place before and after every use. See Appendix A for additional details.

All worn or deteriorated parts shall be replaced by a qualified competent person prior to reissue. No respirator with a known or suspected defect shall be reissued for use.

No attempt shall be made to replace components, adjust, or to make repairs on any respirator other than those recommended by the manufacturer. Only parts made for a specific respirator shall be used with that respirator. Under no circumstances shall parts be replaced by one brand or type of respirator with another. Such substitutions will invalidate the approval of the respirator. Any repair to reducing or admission

valves, regulators, or alarms shall be conducted by either the manufacturer or a qualified trained technician. Supervisors are to be knowledgeable in the specific manufacturer recommendations for respirators used by Loyola University Chicago respirator users. Only a properly trained supervisor may replace any part of a respirator.

Respirator users are responsible for regular inspection of their respirators. Respirators shall be inspected by the user prior to donning and after doffing, each time the respirator is donned or doffed. It is the responsibility of each worker to ensure that their respirator is kept in good condition. Supervisors shall ensure that workers are inspecting their respirators as directed by this procedure. Scheduled inspections of respirators are to be conducted monthly by Supervisors to ensure that they are in good condition and that proper work practices are being followed. Unannounced inspections of respirators shall be conducted at least twice annually.

7.2 Cleaning of Respirators

All respirators in routine use shall be cleaned and sanitized as often as necessary to be maintained in a sanitary condition. Cleaning, sanitizing, proper storage, and assigned routine maintenance that the user is qualified to perform, shall be the responsibility of the person assigned to wear that respirator. Respirators used non-routinely shall be cleaned and sanitized after each use and filters and cartridges replaced. Replacement cartridges and filters are obtained by contacting the Supervisor.

Cleaning and disinfecting respirators shall be done as often as necessary to ensure that contaminates that can be absorbed through the skin, as well as contaminates that may cause dermatitis, or an allergic reaction are removed from all respirator surfaces. Respirators maintained for emergency use, fit testing or training, or those used by more than one person must be cleaned after each use by the user.

Cleaning shall be conducted in accordance with Appendix B-2 to OSHA 29 CFR 1910.134: Respirator Cleaning Procedures (Mandatory) or manufacturer recommendations.

The following procedure is a general recommendation for cleaning and disinfecting respirators. Manufacturer recommendations are to be followed, when available.

1. Remove and properly dispose of all used filters, cartridges, or canisters.

2. Disassemble facepieces by removing speaking diaphragms, demand and pressure-demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts. If the user is not qualified to replace defective parts, the user shall contact a qualified competent person to replace the defective parts.

3. Wash all respirator components in water, preferably running (maximum 110 degrees F) with a cleaner-disinfectant solution that has been approved by the manufacturer. A stiff bristled hand brush may be used to remove dirt. Do not use a wire brush to clean respirator components. Solvents which can affect rubber and other parts shall not be used.

4. Rinse completely for at least 30 seconds in clean, running, warm water. The water temperature shall not exceed 110 degrees Fahrenheit. 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.

5. Air dry or hand dry with a lint free cloth. Do not hang the respirator by the straps to dry as this may cause distortion or undue stress on the straps.

6. Clean all other respirator parts as recommended by the manufacturer.

7. Reassemble the respirator and if qualified, replace any defective parts. If the wearer is not qualified to replace defective parts, the wearer shall contact a qualified competent person to replace the defective parts.

8. Inspect all components to ensure they are operating properly and are in good working order.

9. Test the respirator to ensure proper operation.

10. Place the respirator in a clean, dry plastic bag or other approved suitable container for storage after each cleaning and disinfecting.

7.3 Issuance of Respirators

Respiratory protective equipment shall not be ordered, purchased, or issued to personnel unless the respirator wearer has received written medical clearance, proper respirator training, and achieved a successful fit test. New employees who require respiratory protective equipment must be placed into the Respiratory Protection Program before being issued equipment.

7.4 Storage

After inspection, cleaning, and any necessary minor repairs, respirators shall be stored in a manner which protects against sunlight, heat, extreme cold, excessive moisture, damaging chemicals, or any other contaminants. Respirators shall be packed or stored in a way that ensures that the respirator will not be damaged. Care shall be exercised to ensure that facepieces are stored in a manner which prevents crushing of the respirator or distortion of the sealing surface. Routinely used respirators, such as half-mask or full-face air-purifying respirators, shall be placed in sealable plastic bags. Respirators will be stored in secure areas where the respirator will not be damaged.

Emergency use respirators shall be stored at appropriate work areas or stations in a sturdy enclosure that is quickly accessible at all times and clearly marked.

7.5 Recordkeeping

A Respiratory Inspection Checklist is found in Appendix A of this RPP. Respirator cleaning and inspection records shall be maintained indefinitely.

8.0 PROGRAM SURVEILLANCE

In accordance with ANSI Z88.2, "an appraisal of the effectiveness of the respirator program shall be carried out at least annually. Action shall be taken to correct defects found in the program."

The evaluation of the Respiratory Protection Program will include addressing the following: Wearer acceptance of respirators, Respirator program effectiveness, Appraisal of protection provided by the respirator, and Compliance with regulatory requirements.

The findings of the Respiratory Protection Program evaluation will be documented, and this documentation will list plans to correct faults in the program and set target dates for the implementation of the plans.

9.0 RECORDKEEPING

The following records shall be developed and maintained by each Department for their respective campus with copies submitted to the Occupational Health & Safety office.

Records	*Location*	*Maintain*
Respirator Program Manual with Standard Operating Procedures		Continuously
Medical Evaluations		Duration of employment plus 30 years from termination
Medical Clearance for Respirator Use		Duration of employment plus 30 years from termination
Training Records		Duration of employment
Fit test Records		Duration of employment
Respirator Inspection and Maintenance		Indefinitely
Program Review		Indefinitely

APPENDIX A

Loyola University Chicago
Respirator Inspection Checklist

Employees should contact their Supervisor concerning any questions or inadequacies with their current respirator, if they need a respirator issued or replaced, or for additional supplies are needed.

1. Examine the facepiece for:

    a. Excessive dirt
    b. Cracks, tears, holes, or deformed shape from improper storage
    c. Inflexibility of rubber or silicone
    d. Cracked or badly scratched lenses (full face)
    e. Cracked or broken air-purifying element holder(s)
    f. Badly worn threads or missing gaskets (if required)

2. Examine harness straps for:

    a. Breaks
    b. Loss of elasticity and twists
    c. Broken or malfunctioning buckles and attachments

3. Remove the exhalation valve cover and examine valve for:

    a. Blockage
    b. Foreign material, such as dust, hair, and detergent residue
    c. Cracks, tears or distortion in the valve material
    d. Improper insertion of the valve body in the facepiece
    e. Cracks, chips or breaks in the valve body, particularly in the sealing surface
    f. Missing or defective valve cover
    g. Improper installation of the valve in the valve body

4. Examine the air-purifying element for:

    a. Correct cartridge, canister or, filter
    b. Correct/incorrect installation, loose connections, missing or worn gaskets or cross threading in holder
    c. Expired shelf-life date on cartridge or canister
    d. Cracks or dents in the outside case of filter, cartridge, or canister
    e. Evidence of prior use of sorbent cartridge or canister, indicated by absence of sealing material, tape, foil, etc., over inlet.