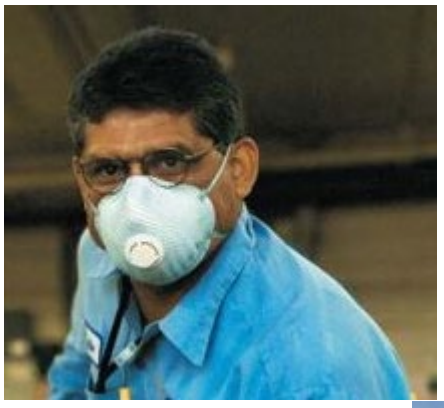
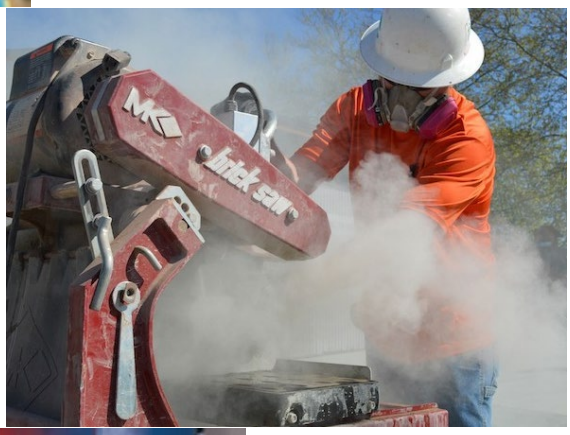
University of Illinois at Chicago

Respiratory Protection Program





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UIC Respiratory Protection Program

1. Introduction

This document establishes the University of Illinois at Chicago's written compliance program for respiratory protection, as required by the Occupational Safety and Health Administration (OSHA) under Title 29 Code of Federal Regulations Part 1910.134. This Respiratory Protection Program addresses the use of respiratory protection as a method to protect UIC employees from unsafe exposures to airborne biological, chemical, and physical agents. Whenever feasible, engineering controls and work practice controls will first be used to maintain worker exposures below exposure limits and at a safe level. It is understood that respiratory protection shall only be required if these controls are not feasible or are not able to reduce exposures adequately.

The Industrial Hygiene (IH) Section in the UIC Environmental Health & Safety Office (EHSO) administers the Respiratory Protection Program (RPP) for the UIC Campus.

2. Responsibilities

Various UIC departments and employees have responsibilities under this program, including:

Environmental Health & Safety Office - Respirator Program Administrator

- Reviewing and periodically revising this program.
- Providing and/or overseeing respirator fit testing and training, including training other designated employees outside EHSO to perform the respirator training and fit testing.
- Monitoring and evaluating respirable hazards in the workplace.
- Providing guidance to supervisors in the selection and purchase ofapproved respirators.
- Maintaining records of exposure assessments, training, and respirator fit testing.

University Health Services (UHS)

- Implementing the medical surveillance program for approved respirator users.
- Conducting medical clearance for respirator users.
- Maintaining medical surveillance records.

Supervisors (Chiefs, Assistant Chiefs and Foreman)

- Notifying EHSO and about workplace conditions with potential respiratory hazards.
- Ensuring that affected employees receive medical clearance and surveillance.
- Ensuring that affected employees receive respirator training and fit testing prior to wearing respirator, and annually thereafter.
- Supplying approved respirators to affected employees free-of-charge.
- Requiring affected employees to wear respirators.

Employees Who Wear Respirators

- Observing the procedures and requirements outlined in this Program and in safety training.
- Attending respiratory protection training sessions and obtaining medical clearance from UHS before wearing a respirator.
- Wearing approved respirators as required.
- Notifying supervisors of changes in the workplace that could change exposures.

3. Exposure Assessments
All practical efforts should be taken to ensure that engineering or other controls are available and implemented to eliminate the need for respiratory protection (i.e. fume hoods and snorkels). Nevertheless, certain situations and operations continue to require the use of respirators where exposures cannot be otherwise managed below the applicable Permissible Exposure Limit (PEL). Also, respirators may be required or desired because of the odor or irritation associated with chemical exposures and particulates, even though exposure levels are well below all applicable regulatory limits.

In the absence of a regulatory exposure limit, commonly accepted guidelines (i.e. Threshold Limit Values-TLVs, Recommended Exposure Limits-RELs, or manufacturers' suggested exposure limits) will be used to evaluate the exposure hazard from a particular operation or environment. Airborne concentrations of hazardous agents may be predicted on the basis of past experience, published results for similar work, or actual air sampling. Predicted airborne concentrations will be extended to all members of the same job title or function unless specific information indicates that exposures vary substantially, in which case more cross-sectional data will be obtained. Where air sampling is needed, measurements will be made with calibrated equipment operated by trained safety and health personnel under the direction of UIC EHSO.
Monitoring will be repeated when changes occur which could render respiratory protection equipment inadequate or changes in job tasks will require new employees to be included in this Program.

4. Respirator Selection
Respirators are selected based on workplace hazard assessments, as well as guidance from 29 CFR1910.134, the American National Standard *Practices for Respiratory Protection*, the NIOSH Guide to Industrial Respiratory Protection, and the latest version of the National Institute for Occupational Safety and Health's *Pocket Guide to Chemical Hazards*. Final selection of any respiratory protective device must be made in consultation with EHSO. Only respirators with approval from the National Institute of Occupational Safety and Health (NIOSH) may be used. The approved respirator for each job classification is in the PPE guide for Facilities Management and Utilities. Employees outside FM and Utilities can contact EHSO for consultation on PPE or the need for a respirator at- https://ehso.uic.edu/contact-ehso/

Respirators are selected based on the anticipated health hazard(s), considering the following factors:

- Chemical, physical, or biological agent(s) present in the work environment;
- Physical state of contaminants (i.e., gas, vapor, dust, aerosol);
- Permissible exposure limit (PEL) and immediately dangerous to life and health (IDLH) levels for the agent. In the absence of a PEL, other suitable exposure guidelines (i.e., ACGIH Threshold Limit Value) or known toxicity of the agent will be considered;
- Anticipated airborne concentration of agent(s) based upon either past experience, mathematical predictions, published results from similar operations, or actual air sampling. If the concentration cannot be predicted or the contaminant(s) unknown, respiratory protection must be upgraded to self-contained breathing apparatus;
- Assigned protection factor (NIOSH) for the respirator type;
- Potential for skin absorption or severe eye irritation;
- Potential for oxygen deficiency;
- Nature and duration of the activity requiring respiratory protection.

Only respirators that can provide protection in excess of the anticipated airborne concentration will be selected (i.e., the assigned protection factor *times* the permissible exposure limit must *exceed* the anticipated airborne concentration).

At UIC, N-95 respirators, half-face air purifying respirators (APR) and powered air purifying respirators (PAPR) are typically sufficient for routine work operations requiring respiratory protection. Cartridge selection is made in accordance with the filtration capabilities; the appropriate cartridge or filter is stipulated in the PPE

guide. Cartridges for gases and vapors must either have an end-of-service-life indicator (ESLI), or must be changed in accordance with the cartridge change schedule described in Appendix A.

5. Restrictions

Respirators requiring a tight face seal for proper performance may not be worn if certain physical or health conditions prevent obtaining the tight seal. These may include: eyeglasses (with tight fitting full facepiece respirators); missing denture(s); facial hair or facial jewelry that interferes with the seal; other physical, health, or prosthetic conditions that interrupt or preclude an effective respirator fit test. Each of these conditions may be remedied as follows:

- Eyeglass Temple Pieces – Where a full-face negative pressure respirator must be worn, a spectacle kit that fits the respirator must be provided to the employee free-of-charge. The employee will then need to visit an optometrist during regular working hours to arrange for the lens to be fabricated to the required prescription. Although the practice is strongly discouraged, contact lenses may be worn provided the respirator is of full-face design.
- Facial Hair or Facial Jewelry Impeding Effective Seal – Where an employee is required to wear a tight-fitting negative-pressure respirator, and facial hair or facial jewelry impedes an effective facial seal, the hair or jewelry must be removed before that respirator can be worn.
- Other Issues – Other issues (e.g., prosthetics, facial malformations) that could prevent the effective use of a respirator will be addressed on a case-by-case basis with UHS during the medical screening.

6. Fit testing

Employees who are required to use a tight-fitting respirator must be fit-tested before initial respirator issuance and annually thereafter. In addition to the fit testing, the employee should conduct a respirator seal check prior to each use. User seal check procedures as mandated by OSHA are outlined in Appendix D. Qualitative fit testing is performed using saccharin or Bitrex. Quantitative fit testing for full-face respirators is performed as necessary using the TSI Portacount. This fit testing is performed following the procedures mandated by OSHA in 29 CFR1910.134.

Fit testing is repeated annually and must also be repeated if the user's health/physical characteristics significantly change (e.g., surgery, accident, change or loss of dentures). Qualitative fit testing verifies an assigned protection factor (APF) of 10 for the disposable N95 respirators. Qualitative fit testing also verifies an APF of 10 for ½ mask and full-face respirators. If an APF greater than 25 is desired, quantitative fit testing will be conducted for full face air purifying respirators, for an APF up to 50. Records of fit testing are maintained by UHS and EHSO.

7. Training

Employees and supervisors required to wear respirators during employment at the University must receive initial and annual training in the proper use, care, and limitations of the selected respirator; details of this program; and on OSHA's requirements under 1910.134. At a minimum, the following items will be covered during the training session:

- The nature of the respiratory hazard (i.e., what specific chemical substances or microbiological species are present; what areas, operations, or conditions involve potentially hazardous exposures; and what effects (symptoms) may result, if respirators are not used).
- An explanation of why engineering controls are not immediately possible and a discussion of what efforts are being made to eliminate or minimize the need for respirators.
- An explanation of why the respirator type selected is the proper one and what factors affect selection.
- A discussion and demonstration on how to use the respirator; i.e., how to inspect, put on and remove, check the seals, etc.
- Instruction on the proper techniques and importance of cleaning, disinfection, inspection, maintenance, and storage of the respirator.
- A discussion of the capabilities and limitations of respirators (i.e., in what environments or under what

circumstances (such as oxygen deficiency) the respirator does not offer adequate protection) and any warning signs (odor, etc.) that may indicate the respirator is not functioning properly.
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions.
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators.
- The general requirements of OSHA's respirator standard.

8. Voluntary Use

Under some circumstances, employees may wish to use respiratory protection equipment for their own comfort or sense of well-being, even when there is no recognized hazard or potential for overexposure. Respirator use in these circumstances would be considered "voluntary" and many elements of OSHA's respiratory protection standard would not apply. For voluntary users of N95 respirators, annual respirator fit testing is not required but EHSO recommends initial fit testing to help ensure proper size selection. Voluntary users of filtering facepiece respirators (N95) are also not required to undergo medical clearances.

However, voluntary users of all other respirators (half-mask respirators) are required to complete the medical clearance questionnaire and be medically cleared and fit tested annually. They must also complete annual training on the proper use of a half-mask respirator. Those employees who wear an N95 on a voluntary basis are provided with the required information (from 29 CRF1910.134).

9. Equipment Inspection

Employees must inspect their respirator before and after each use, including face seals and shield (full face units), cartridge receptacles, straps, and inhalation and exhalation diaphragms. Components made of rubber, silicone, or another elastomer must be inspected for pliability and any signs of deterioration. If any parts are damaged, the unit must be immediately taken out of service and the area supervisor notified so that a suitable replacement or repair can be made.

When donning a respirator, hair must be pulled back and away from the seal area, and negative and/or positive pressure seal checks conducted to evaluate the facial fit and unit integrity. If an air-tight seal cannot be made by adjusting the tightening straps, then the respirator must be inspected for damage and either repaired or replaced.

When using a respirator, employees must immediately stop work and leave the area if they:
- Detect vapor or gas breakthrough, changes in breathing resistance, or leakage or the facepiece,
- Develop any signs or symptoms of over-exposure,
- Are alerted to a low battery condition (PAPR),
- Need to wash their face and respirator facepiece as necessary to prevent eye or skin irritation associated with respirator use, or
- Need to replace the respirator or the cartridge.

If a possible exposure may have occurred during respirator use, notify the area supervisor, EHSO, and then UHS for medical evaluation. Remove the respirator from service and inspect it for damage or other problems. If the cause cannot be identified and corrected, contact EHSO for guidance.

10. Equipment Maintenance and Storage

Respirators should be cleaned with detergent and water after each use, and then air dried before storing. Respirators must be disinfected with either isopropanol or an elastomer-safe disinfectant such as benzalkonium chloride pads. Store respirators in sealable plastic bags away from sources of potential contamination, and never stack them under heavy items that could deform the elastomer facepiece.

In general, air purifying cartridges should be removed from the respirator after use and discarded. However, when used for only a short duration against relatively low concentrations of contaminants, cartridges may be sealed in an impermeable plastic bag and reused later. See cartridge change schedule for guidance. Cartridges

can be reused until an end-of-service life indicator activates, the time period indicated in the cartridge change schedule has elapsed, breakthrough has occurred (i.e., odor detected), or resistance to breathing is detected, whichever comes first. When storing cartridges for reuse, a written record showing the date, contaminant(s), and duration of use must be kept with the cartridges. Discard N95 and other disposable respirators at the end of your shift.

11. Medical Surveillance

The following medical services are available to affected employees free-of-charge, at University Health Services.

a. Medical evaluations are performed on all employees wearing respirators at UIC (to medically clear them) prior to respiratory use (excluding voluntary use of N95, where medical surveillance is not required). UHS performs the initial evaluation using a medical questionnaire for N95 respirators. A follow-up medical examination is provided for an employee who gives a positive response to any question among questions 1 through 8 in Section 2, Part A or whose initial medical examination demonstrates the need for a follow-up medical examination. This questionnaire is available from UHS.

b. To be medically cleared for a half-face respirator, you must make an appointment with UHS. If you participate in the asbestos medical surveillance, you will be cleared for a respirator during the surveillance exam.

c. Confidential post-exposure medical evaluation and follow-up is made after documented or suspected over-exposures. Employees must notify their supervisors of such incidents and assist EHSO in documenting all relevant conditions of the incident. This information will then be provided to the UHS to arrange for any required medical follow-up.

12. Respirator Program Evaluation

EHSO will maintain an up-to-date list of departments and job titles that require the use of respiratory protection. Affected employees shall be regularly consulted about the effectiveness of the respirator program during annual respirator training. This Respiratory Protection Program shall be reviewed annually.

Appendix A: Respirator Change Schedule

RESPIRATOR CHANGE SCHEDULE

All air-purifying respirators used for protection against gases and vapors must have an end-of-service-life indicator (ESLI) or have a cartridge change schedule that is based on objective information or data to ensure that cartridges are changed before the end of their service life. The following change schedule is determined based on OSHA standards, manufacturer's recommendations, and the ACGIH recommendations.

Type of Respirator	**Cartridge Change Schedule**
Half-Mask APR	Maximum of 8 hours use total.
N95	Throw away if visibly dirty or contaminated, torn or otherwise damaged, throw out at the end of the work shift.

Appendix B: Approved Respirator List and Job Titles

Approved Respirator List and Job Titles and Tasks Requiring the Use of a Respirator (FM and Utilities)

Approved Respirator and Job Title			
Applicable PPE	Picture of PPE	Job Title	Tasks When Required
N95 Respirator (3M:1860S- 4MH51 and 1860- 4MH50)		Only: building engineers, carpenters, hospital environmental services, electricians, locksmiths, machinists, painters, pipefitters; who work in the Hospital.	-Wear when working in designated signed areas of the Hospital or when exposed to blood, vomit, or other bodily fluids during cleaning or maintenance. -Wear for general maintenance of building HVAC system (replacement of filters). Can be worn if concerned about potentially infected material (blood, bodily fluids), and infectious agents (bacteria and virus) in the hospital and OCC. -Wear when working in designated signed areas of the Hospital during painting tasks. -An N95 respirator requires medical clearance, training, and fit testing.
Half Face Respirator with Defender Vapor and Particulate Cartridge (Honeywell North- D9084 and 16M232)		Building engineers, carpenters, electricians, lampers, machinists, painters, pipefitters	-Use if concerned about damage friable asbestos or heavy dust. (optional) -Wear for general maintenance of building HVAC system (replacement of filters) for buildings with research laboratories. -Can be worn if concerned about high hazard environments with chemical vapors and/or friable asbestos and/or silica. -Can be worn if concerned about potentially infected material (blood, bodily fluids, wastewater), and infectious agents (bacteria and virus). -Wear when working in a building penthouse near fume hood exhaust fans or on a live fume hood exhaust line in a building.

			-A half-face respirator requires medical clearance, training, and fit testing. -Depending on the tool used in table 1 of the Silica Regulations, a half-face respirator may be required. Respirator selection is based on the tool and duration of work. -Use if bothered by heavy dust from sanding walls to prepare for painting. -Cutting concrete or drilling large holes in concrete for brackets may require a half-face respirator depending on the duration of the task. See table 1 of Silica guide for details. -Use if bothered by heavy wood dust. -Wear if using chemicals for extended periods of time without adequate ventilation.

Appendix C: Respirator User Seal Check

RESPIRATOR USER SEAL CHECK

Persons using tight-fitting respirators (i.e. half-face respirator) must perform a user seal check to ensure that an adequate seal is achieved each time the respirator is put on. Either the positive and negative pressure checks listed in this appendix, or the respirator manufacturer's recommended user seal check method must be used. User seal checks are not substitutes for qualitative or quantitative fit tests.

I. Facepiece Positive and/or Negative Pressure Checks

A. **Positive pressure check**. Close off the exhalation valve and 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 outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

B. **Negative pressure check**. Close off the inlet opening of the cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. The design of the inlet opening of some cartridges cannot be effectively covered with the palm of the hand. The test can be performed by covering the inlet opening of the cartridge with a thin latex or nitrile glove. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

II. Manufacturer's Recommended User Seal Check Procedures

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

Appendix D: Voluntary Use of Respirator – Required Information

This form is provided to all voluntary users of filtering facepieces (N95) at UIC.

Some University of Illinois at Chicago (UIC) employees, and students, may choose to use filtering facepiece respirators, also referred to as N95, on a voluntary basis during activities that involve exposures to low-level, non-hazardous nuisance dust or other similar particulate. According to the EHSO Respiratory Protection Program and Occupational Safety and Health Administration (OSHA) regulations, UIC must provide you with the following information if you wear a filtering facepiece respirator voluntarily. The following information is copied from the OSHA Respiratory Protection Standard and pertains to the voluntary use of respirators. After reading the information below, please complete the section at the end of this form.

29 CFR 1910.134, Appendix D - (Mandatory) Information for Employees Using Respirators When Not Required Under the Standard

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirator's limitations.
2. Choose respirators (UIC approved respirators outlined in this Program) certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

The filtering facepiece respirator you have elected to use is approved, when fitted properly, for use against nuisance non-hazardous particulate (e.g., fiberglass, sheet rock dust, sawdust, dirt, pollen, animal dander). It will not provide protection from any chemical vapors such as those associated with spray paints or solvents. It is not intended for use during work that may involve exposure to airborne asbestos fibers, silica dust, or lead dust. If you have questions concerning any of this information, please call EHSO at 312-996-7411.

Please complete the section below to indicate that you have read understood the information provided above:

Name (Print): _____ Job Title: _____

UIN: _____ Net ID: _____

Department: _____ Supervisor: _____ Location of Use: _____

Reason for using respirator (describe nature of work, specific location, and type of particulate):

_____

_____ _____

Signature Date