CSUDH | ENVIRONMENTAL HEALTH & SAFETY

# RESPIRATORY PROTECTION PROGRAM

Revised March 20, 2020

# Contents

## Scope and Purpose

California State University, Dominguez Hills (CSUDH) is dedicated to protecting the health, safety and wellbeing of students, employees, visitors, and the surrounding community. The Respiratory Protection Program is established to protect employees from hazardous airborne substances specifically particulate matter, toxic gases, fumes and vapors.

The Program applies to employees who work in potentially hazardous atmospheres, and outlines accepted practices for respiratory equipment use including information and guidance on the proper selection, use, and care of respirators and requirements governing their use. Environmental Health & Safety (EHS) administers and oversees implementation of the program.

The program complies with Cal/OSHA's requirement for CSUDH to develop and implement a written respiratory program as defined in the following regulation:

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| California Code of Regulations (CCR), Title 8 Section 5144 | https://www.dir.ca.gov/title8/5144.html |

## Definitions

**Air-purifying respirator (APR) –** A respirator that works by removing gas, vapor, or particulate, or combinations of gas, vapor, and/or particulate from the air through the use of filters, cartridges, or canisters that have been tested and approved for use in specific types of contaminated atmospheres by NIOSH. This respirator does not supply oxygen and therefore cannot be used to enter an atmosphere that is oxygen deficient.

*Note*: Cartridges, canisters and filters are approved for use against specific hazards where the concentration is known or can be reasonably estimated. Some combination organic vapor/particulate cartridges and canisters are approved for use against CS and CN tear gas.

**Approved** – Respirators and cartridges that have been tested and listed as satisfactory by the National Institute for Occupational Safety and Health (NIOSH).

**Cartridge** - A small container filled with air-purifying media that attaches to a respirator.

**CBRN** – Chemical, biological, radiological, and nuclear defense.

**Contaminant** - A harmful, irritating, or nuisance agent foreign to the normal atmosphere.

**Exhalation Valve** - A device which allows exhaled air to leave a respirator and prevents infiltration of outside air.

**Face-piece** - The portion of a respirator that covers the wearer's nose and mouth in a half face-piece and nose, mouth, and eyes in a full face-piece. It seals to the face and includes the headbands, exhalation valve(s), and connections for an air-purifying device.

**Filter** - A medium used in respirators to remove solid or liquid particles from the air stream entering the respiratory enclosure.

**Filtering Face-Piece** - A negative pressure particulate respirator with a filter as an integral part of the face-piece or with the entire face-piece composed of the filtering medium (e.g. a dust mask).

**High-Efficiency Particulate Air (HEPA) Filter -** A filter that removes 99.97% of specific particulates from an air stream.

**Inhalation Valve** - A device that allows air to enter the face-piece and prevents exhaled air from leaving the face-piece.

**National Institute for Occupational Safety and Health (NIOSH)** - A Federal agency that tests, approves, and certifies respirators and cartridges.

**Oxygen Deficient Atmospheres** - Air that contains less than 19.5% oxygen by volume.

**Particulate** – Airborne solid or liquid dusts, fogs, fumes, mists, smokes, or sprays.

**Permissible Exposure Limit (PEL)** – Contaminant exposure concentrations listed by the California Occupational Health and Safety Administration (Cal/OSHA) that a healthy individual normally can tolerate for 8 hours a day, five days a week, without harmful effects. Particulate concentrations are listed as milligrams per cubic meter of air ($mg/m^3$), and gaseous concentration are listed as parts per million by volume (ppm).

**Powered Air-Purifying Respirator (PAPR)** – An air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

**Qualitative Fit Test** - A test method that relies on the respirator wearer's sense of taste, smell, or irritation to detect leakage into the respirator facepiece using isoamyl acetate, saccharin, bitrex, or irritant smoke.

**Quantitative Fit Test** – A test method using a machine to measure the actual amount of leakage into the facepiece that does not rely upon the wearer's sense of taste, smell, or irritation to detect leakage.

**Respirator** - A device that protects the wearer from inhalation of harmful contaminants.

**Useful Service Life** – The length of time that respirator cartridges provide adequate protection from harmful chemicals in the air.

**Vapor** - The gaseous state of a substance.

# Responsibilities

EHS is responsible for the following:

- Perform exposure assessment and monitoring to determine appropriate respiratory protection requirements.
- Conduct annual training for all employees who are required to wear a respirator.
- Coordinate annual medical evaluation and fit testing for all employees who are required to wear a respirator.
- Maintain training, fit testing, and "pass/fail" medical evaluation records.
- Enroll employees in the Program and provide authorization to wear a respirator.
- Evaluate and approve voluntary use of respirators.

- Remove employees from the Program and revoke authorization to wear a respirator if employee fails to meet the Program requirements.
- Review and evaluate the Program for effectiveness and update the Program as needed.

Campus departments are responsible for the following:

- Implement practices that protect the health and safety of employees, visitors, and students at campus facilities under their control.
- Purchase and issue respiratory protection equipment including respirators, cartridges, and cleaning supplies upon recommendation and authorization by EHS.

Supervisors are responsible for the following:

- Identify employees who will perform tasks that require respiratory protection and contact EHS to enroll the employees into the Program. Employees are not permitted to wear a respirator until authorized by EHS.
- Request assistance from EHS to evaluate changes in work area conditions or degree of exposure or stress that may affect respirator effectiveness.
- Ensure adequate air quantity, quality, and flow of breathing air for atmosphere-supplying respirators. (See (c)(1) of the standard.)
- Enforce the proper use of respiratory protection equipment where it is required and the requirement for authorized use.

Employees are responsible for the following:

- Utilize the issued respiratory protection equipment in accordance with instructions and training provided by EHS.
- Inform the supervisor immediately of any personal health problems that could be caused or aggravated by using respiratory protection equipment.
- Inform the supervisor of any change in work area conditions or degree of exposure or stress that may affect respirator effectiveness.
- Inspect and care for respiratory protection equipment.
- Report any observed or suspected malfunctioning respirator to EHS.
- Use only those brands, sizes, and types of respiratory protection equipment for which they have been specifically fit tested for and trained to use.
- For half-face air purifying respirators, use the appropriate type of cartridge for the airborne exposure hazard, and follow the manufacturer's cartridge change-out schedule.
- Ensure an effective face to face-piece seal during respirator use.

## Authorization

Only staff designated by their Supervisor and authorized by EHS may wear respirators while working at CSUDH. Employees must complete respirator fit testing, training, and required medical surveillance prior to wearing a respirator and annually thereafter.

## Respirator Selection

EHS has evaluated the respiratory hazards of various job classifications throughout CSUDH and has prepared a respirator selection matrix (Appendix A). Please refer to the matrix to select the appropriate

type of respirator or consult with EHS. Respirators and cartridges will be issued by departments at no cost to employees.

The following types of respirators are used on campus:

- **N95 Respirators** - N95 filtering face-piece respirators are available to authorized users, such as staff at the Student Health Center (SHC) and those who voluntarily choose to use them. The staff at the SHC must be fit tested for use in compliance with Title 8, Section 5199, regarding aerosol transmissible diseases. Voluntary users are not fit tested.
- **Air-purifying Half Face-piece Respirators** – These include 3M and North brands which are provided by the department. They do not provide protection in oxygen deficient atmospheres. Half face respirators use various types of filter cartridges to protect against various hazards. HEPA filter cartridges protect against particulates such as asbestos, lead, and low levels of toxic and radioactive particulates. Other filters protecting against specific contaminants such as acid gases or organic vapors. Combination filters protect against all or a few of these specific contaminants. All users of half-face respirators must be fit tested.

## Medical Evaluation

Only those individuals medically qualified to wear respirators and have completed the associated requirements for fit testing and training shall be issued a respirator (this includes the N95 type respirator, if respiratory protection is mandatory). Those who voluntarily choose to use a N95 respirator as a dust mask are not medically evaluated or fit tested. Medical evaluation for respirators generally involves completing a questionnaire consistent with the requirements of Appendix C of CCR Title 8, Section 5144. A contracted occupational health physician reviews it and may request a physical examination based on provided responses. Medical evaluation for CSUDH employees is performed at the campus' Workers Compensation provider:

**Western Medical Group**
**21081 S Western Ave #150**
**Torrance, CA 90501**

Medical evaluations are provided for employees at no cost. EHS receives and maintains a "pass/fail" record of the medical evaluations. Employees may request a copy of their complete medical evaluation by contacting Western Medical Group at (310) 782-3333.

Medical evaluation MUST be performed prior to fit testing.

## Medical Evaluation for University Police Officers

University Police officers are considered medically qualified to use respiratory protective equipment after completing the POST Medical History Statement (POST 2-252) or its equivalent and successfully passing a physical examination that occurs as a condition of employment. The pre-employment physical must meet or exceed the standards described in the POST Medical Screening Manual for California Law Enforcement. Employees who were hired prior to the implementation of the POST Medical History Statement (POST 2-252) shall complete the Cal/OSHA medical questionnaire and department medical personnel shall review it.

Medical evaluations are required for any officer when any of the following occurs:

- An officer reports medical signs or symptoms that are related to the ability to use a respirator.
- A physician or other licensed health care professional, a supervisor, or the Program Administrator informs the Chief of Police that an officer needs to be reevaluated.
- Observations made during fit testing and program evaluation indicate a need for re-evaluation.
- A change occurs in workplace conditions that may result in a substantial increase in the physiological burden placed on an officer.

## Employee Education and Training

Prior to wearing a respirator, employees enrolled in the Program shall complete initial Respiratory Protection Program Training. Employees enrolled in the Program shall be retrained annually. Additional training shall be provided when there is a change in the type of respiratory protection used, or when inadequacies in the employee's knowledge or use of the respirator indicate that he/she has not retained the requisite understanding or skill.

Training will be provided at no cost to employees by EHS and/or through web-based training on the following content:

- Why the respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator.
- What the limitations and capabilities of the respirator are.
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions.
- How to inspect, put on and remove, use, and check the seals of the respirator.
- What the procedures are for maintenance and storage of the respirator.
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators.
- How to decontaminate (or safely dispose of) a respirator that has been contaminated with chemicals or hazardous biological materials.
- The general requirements of Title 8 CCR 5144.

No CSUDH employee will be required to work in IDLH atmospheres, and therefore the training for most employees will focus on work in and around low-hazard atmospheres and nuisance dusts. University Police officer respiratory protection training will also include information on how to use respirators for general-duty and CBRN incident response.

## Respirator Fit Testing

The Program requires qualitative or quantitative respirator fit tests as determined by EHS to ensure a tight-fitting seal. The Program also prohibits respirators with tight-fitting facepieces to be worn by employees who have facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function. Facial hair is allowed as long as it does not protrude through the respirator seal or extend far enough to interfere with the device’s valve function. Fit testing shall not be performed, nor shall a respirator be worn, if facial hair interferes with the seal.

Fit testing can detect and help correct poorly fitting or performing respirators based upon contaminant leakage into the respirator. During fit tests, adjust the straps properly as comfortably as possible to

simulate working conditions. Cal/OSHA fit testing procedures are described in Appendix A of Title 8 CCR 5144 and summarized below.

- Before an employee is required to use any respirator, the employee must be fit tested with the same make, model, style, and size of respirator to be used. Employees shall be provided with a sufficient number of respirator models and sizes so that he/she may select an acceptable face piece.
- Fit tests shall be provided at the time of initial assignment and at least annually thereafter. Additional fit tests shall be provided whenever an employee reports a physical condition that could affect respirator fit. These conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight.
- Employees fitted for full-face APRs who wear corrective glasses or other personal protective equipment must be sure that such equipment is worn in a manner that does not interfere with the face piece seal. The glasses or personal protective equipment that must be worn with the respirator shall be taken to the fit-test assessment and worn during the test.
- Employees who are issued a full-face APR will use a quantitative (numerical measurement of leakage) method fit test.

Fit testing for University Police officers is performed by the Department Armorer using a TSI Portacount Pro. Fit testing for all other employees is performed by EHS or a provider designated by EHS.

Fit test records are maintained by the University Police Department for officers and by EHS for all other employees. Fit testing is provided to employees at no cost.

The types of fit testing are described below:

- **Qualitative Fit Test** – Options for fit testing include irritant smoke (stannic chloride), Bitrex solution, or banana oil applied to the face to face-piece seal. Irritant smoke is applied approximately six inches from the seal as the respirator wearer counts loudly from 100 to 1 or repeats the OSHA “Rainbow Passage” while moving the head from side-to-side and up-and-down. The test simulates movements and conversation the wearer will perform during the course of their work. Infiltration of the smoke will cause the wearer to cough involuntarily and result in an unsuccessful test. If no smoke infiltrates the seal, the test is successful. The Bitrex solution or banana oil is used with the employee inside of a test enclosure. The test is successful if the wearer cannot taste the solution caused by infiltration of the mask. A sensitivity test confirms that the wearer can detect the solution.
- **Quantitative Fit Test** – A machine is used to measure the actual amount of leakage into the facepiece and does not rely upon the wearer’s sense of taste, smell, or irritation in order to detect leakage. The respirator is worn by the wearer and connected to the machine with tubes or hosing. Three methods are accepted by Cal/OSHA: general aerosol, ambient aerosol, and controlled negative pressure.

Quantitative tests provide a numerical fit factor for each respirator. These fit factors relate to a specific respirator, but Cal/OSHA has assigned protection factors (PFs) to different classes of respirators as guidance on proper selection. Like the fit factor, the PF equals the ambient concentration of a contaminant divided by the concentration within the respirator (PF = ambient concentration/inside concentration). Half face-piece respirators generally provide a PF of 10 and full face-piece respirators provide a PF of 50. Example: Work with a half face-piece respirator in an atmosphere with 10 ppm

contaminant concentration equates to an actual exposure of 1 ppm.

In addition to either qualitative or quantitative fit testing, APR wearers shall perform a positive and negative air pressure check each time the respirator is donned prior to entering a hazardous atmosphere.

- **Positive/Negative Air Pressure Check** - Prior to each use, the respirator wearer will complete a negative pressure test. Don the respirator and place the hands over the inlet of the filter cartridges to restrict air from passing through; inhale gently so the face-piece slightly collapses; and hold their breath for approximately 10 seconds. If the face-piece remains slightly collapsed and no inward leakage occurs, the test is successful. Next, complete a positive pressure test by covering the exhalation valve and exhaling gently into the face-piece. If no outward air leakage occurs the test is successful.

## Voluntary Use

Upon request by an employee, EHS may authorize employees to voluntarily wear a respirator, if EHS determines that such respirator use will not in itself create a hazard.

Voluntary users of N95 respirators are exempt from medical evaluation and fit testing but must complete the initial Respiratory Protection Program training prior to wearing a respirator.

Voluntary users of half-face respirators must be enrolled in the Respiratory Protection Program and complete the same requirements as employees who are required to wear respirators (i.e., they must receive fit testing, medical evaluation, and initial and annual training).

Refer to Appendix B for more information on voluntary use of respirators. Contact EHS to request to wear a respirator on a voluntary basis.

## Emergency Use

CSUDH does not supply respirators for use in immediately dangerous to life and health (IDLH) atmospheres. Respirators issued under this program shall not be used to enter any area that is designated as the exclusion ("hot" or "red") zone, or the contaminant reduction ("warm" or "yellow") zone of a hazardous materials incident. University Police officers are provided with CBRN powered air purifying respirators (PAPRs) for escape from hazardous materials environments during emergency response.

For continuous duty in maintaining the perimeter of hazardous materials or crowd control incidents, University Police officers shall use approved gas masks and other APRs. Respirators shall be selected that are approved for the contaminants that are believed to be present, and wearers shall not be located in atmospheres in which concentrations exceed the protection factor of the respirator.

Select University Police, laboratory and EHS employees who have received proper training, may use respiratory protection to clean up small chemical spills. Refer to the campus Chemical Hygiene Plan for information on small spill clean-up procedures.

## Respirator Care

Respirators are issued by the department. Respirator wearers are responsible for caring for their respirators. If a respirator exhibits any defects, return it to the department and request a new respirator.

Prior to and after each use, the respirator wearer must inspect all parts of the respirator to ensure it is not cracked, decomposed, distorted, frayed, loose, pitted, stretched, stiffened, swollen, torn, or warped. Such parts may include: rubberized face-piece, plastic adapters, inhalation valves flaps, headband straps, plastic exhalation valve seats, exhalation valve covers, and filter elements.

Employees must clean the respirator after each use with either respirator wipe pads or by removing the filters and straps and using a mild soap solution and a soft brush. After using soap, rinse with clean warm water and air dry. Store the respirators in a cool dry location without distorting the face-piece.

## Cartridge Change-out Schedule

Air purifying respirator cartridges don't last forever. The useful service life of a cartridge depends upon many factors, including environmental conditions, breathing rate, cartridge filtering capacity, and the amount of contaminants in the air. The Program requires that employees follow the cartridge manufacturer's recommendations for cartridge change-out schedule or one year from the date that cartridges were first used, whichever is sooner. If manufacturer's recommendations are not available contact EHS for guidance.

## Exposure Assessment

Employees wishing to use a respirator should contact EHS for an exposure assessment. EHS will establish whether exposures to hazardous substances exceeds Cal/OSHA permissible exposure limits (PELs). The employee enters the Program when exposures exceed the PEL and engineering and administrative controls cannot successfully reduce exposures. EHS compares exposures to the respirator protection factor to select the appropriate respirator.

## Record Keeping

Program records include enrollee names, training tracking, completed fit tests, and medical evaluations. All program records for University Police officers are maintained by the University Police Department. Program records for all other employees are maintained by EHS except for complete medical evaluations, which are maintained by Western Medical Group.

Records shall be maintained in accordance with the CSU Executive Order 1031 record retention schedule: http://www.calstate.edu/recordsretention/documents/EHS.pdf

A copy of this program and the above records shall be made available to all affected employees, their representatives, and representatives of the Chief of the Division of Occupational Safety and Health.

## Program Effectiveness Evaluation

EHS will evaluate the Program for effectiveness every three years to ensure that the written Program is being properly implemented, and to consult with employees to ensure that they are using the respirators properly.

EHS will conduct evaluations of the workplace as necessary to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective.

CSUDH will consult employees required to use respirators to assess the employees' views on program effectiveness and to identify any problems. Any problems that are identified during this assessment shall be corrected. Factors to be assessed include, but are not limited to:

- Respirator fit (including the ability to use the respirator without interfering with effective workplace performance).
- Appropriate respirator selection for the hazards to which the employee is exposed.
- Proper respirator use under the workplace conditions the employee encounters.
- Proper respirator maintenance.

# Appendix A

## Respirator Selection Chart

| Job Category | Type of Job Task | Mask | Filter |
|---|---|---|---|
| Housing Maintenance | Inspection and cleaning of microbial-impacted surfaces | N95 | N/A |
| Housing Maintenance & Facilities Services Maintenance | Cutting of concrete and Hardie Board | N95 | N/A |
| Chemistry and Biology Instructional Support Technicians | Small chemical spill clean-up** | Half-face air purifying respirator (APR) | Organic vapor and acid gas |
| Library Staff | Inspection and cleaning of microbial-impacted book surfaces | N95 | N/A |
| Student Health Center Clinical Staff | Direct interaction with patient suspected of having an Aerosol Transmissible Disease (ATD) | N95 | N/A |
| University Police | Crowd control and response to CBRN incident | CBA/RCA Air Purifying Respirator (APR) | CBRN Cap-1 canister |

**Please refer to Spill Kit Training in the "Chemical Hygiene Plan" policy.

# Appendix B

## Voluntary Respirator Use Program

Respirators are an effective method of protection against certain airborne hazards when properly selected and worn. Respirator use is encouraged even when exposures are below the exposure limit, to provide an additional level of protection for workers.

However, if a respirator is used improperly or not kept clean and maintained, the respirator itself can become a hazard to the worker. Sometimes, workers may desire to wear respirators to avoid airborne exposures even if the amount of hazardous substance does not exceed the limits set by regulatory standard. If your department provides a respirator for your voluntary use, or if you provide your own respirator, you need to take certain precautions to ensure the respirator itself does not present a hazard.

You must do the following:

- Read and follow all instructions provided by the manufacturer on use, maintenance, cleaning and care, and the respirator's limitations.
- Choose respirators certified for use to protect against the contaminant of concern. The National Institute for Occupational Safety and Health (NIOSH) 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.
- Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designated to protect against. For example, a respirator designed to filter out particulate matter will not protect you against gases or vapors.
- Keep track of your respirator so that you do not mistakenly use someone else's respirator.