



# **Respiratory Protection Program**

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# 1. Purpose

University of Colorado Boulder's Environmental Health and Safety (EH&S) has developed this Program to promote a safe work environment and to protect the health and safety of CU Boulder employees and students who are potentially exposed to airborne contaminants or may occupy an oxygen deficient atmosphere. The Occupational Safety and Health Administration (OSHA) promulgated a final rule [29 CFR 1910.134](#). This standard applies to all employees or students who are required to wear a respirator for any of their job tasks.

# 2. Objectives

This Program applies to all CU Boulder employees and students who are exposed to airborne contaminants that cannot be controlled through engineering or administrative controls. Employees who anticipate wearing respiratory equipment during an emergency incident are also covered.

This Program has the following objectives:

- Identify employees and students that are exposed to hazardous levels of airborne contaminants or become involved in tasks that take place in oxygen deficient atmospheres;
- Choose a respirator and filter or cartridge that will offer adequate protection. If a filter or cartridge doesn't offer adequate protection, supplied air respirator may need to be used;
- Document all required medical surveillance to ensure that employees and students are physically able to wear respiratory protection;
- Fit test all employees and students who are required to wear a respirator during their work tasks; and
- Train employees and students required to wear a respirator or voluntarily choose to wear a respirator on the proper use, limitations, maintenance and storage of the respirator.

No employee or student of CU Boulder shall be issued or required to wear a respirator until the need for such protection is validated by EH&S and the affected employee or student has met the criteria set forth by OSHA.

# 3. Authority and Responsibilities

A. Environmental Health and Safety (EH&S) shall be responsible for:

- Developing and administering the Respiratory Protection Program;



- Identifying work areas within CU Boulder facilities that have a need for employees or students to use a respirator;
- Performing necessary monitoring to determine exposure to potentially hazardous airborne contaminants;
- Determining if engineering and administrative controls can be put in place to eliminate exposure to respiratory hazards;
- Providing training and fit testing, or verifying it is done accordingly by a designee;
- Confirming that the employees or students are medically fit to wear a respirator;
- Maintaining fit test and training records;
- Evaluating and updating this Program periodically or whenever new information is available; and
- Ensuring compliance with all federal, state, and local regulations.

**B. Departments shall be responsible for:**

- Identifying employees and students that are working with or have the potential to be exposed to respiratory hazards;
- Notifying EH&S of potential respiratory hazards;
- Providing the appropriate work practices and controls for respiratory hazards;
- Providing necessary respiratory protection for all employees or students that are required to wear a respirator;
- Providing necessary equipment so that the user is able to clean and disinfect their personal respirator after each use;
- Ensuring that all employees or students who are required to wear a respirator as part of their job duties have received the proper training, fit testing, medical evaluation and equipment;
- Enforcing the proper use and maintenance of respiratory equipment;
- Covering costs associated with medical evaluations and necessary equipment; and
- Coordinating and consulting with EH&S to ensure compliance with all federal, state and local requirements.

**C. Employees or students shall be responsible for:**

- Completing the mandatory medical evaluation and any medical requirements deemed necessary by the evaluating health care professional;
- Provide proof of fit test to EH&S if conducted by Medical Evaluator or schedule a fit test with EH&S if needed;
- Completing annual respiratory training and fit testing;
- Performing inspections, care and maintenance of the respiratory equipment;



- Using the respiratory equipment correctly and conducting the proper pressure checks;
- Notifying his/her supervisor of any problems with the respirator or concerns about exposure to respiratory hazardous;
- Notifying his/her supervisor of any other respiratory hazards that have not been adequately addressed; and
- Maintaining facial surface consistent with a proper fit of the respirator (i.e., respirators shall not be worn when facial hair comes between the sealing surface of the face piece and the face or that interferes with valve function).

**D. Medical Evaluator, as identified by each department, shall be responsible for:**

- Reviewing medical questionnaire forms to determine if an employee or student is medically fit to wear respiratory protection equipment;
- Determining what tests, evaluations or medical checks are necessary to make the determination if an employee is medically fit to wear respiratory protection equipment;
- Providing determination if medically fit to wear respiratory equipment to EH&S or other responsible groups who are conducting the fit testing on behalf of EH&S
- Providing a follow-up medical evaluation for any employee or student who they deem necessary based on responses from the questionnaire;
- Maintaining records as determined in the Recordkeeping section of this Program.

## **4. Program Elements**

### **A. Permissible Practice**

The primary objective shall be to prevent occupational diseases caused by breathing contaminated air. This shall be accomplished by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible (or while they are being instituted), appropriate respirators shall be provided and used consistent with this Program when necessary.

### **B. Voluntary Use of Respiratory Protection**

The Respiratory Protection Program at CU Boulder is intended to protect employees and students against recognized health hazards. However, some employees and/or students may be sensitive to or irritated by the presence of non-hazardous levels of air contaminants (such as non-hazardous particulates



like pollen, dust, or animal dander). When use of a respirator will help to alleviate irritation and when the filtering facepiece respirator itself is judged to pose no additional risk to the wearer, CU Boulder employees and students will be allowed to voluntarily use respirators for comfort reasons and to prevent allergies.

Voluntary use of respirators is only applicable if an exposure assessment by EH&S has been conducted, published exposure limits are not exceeded, and respirators are not required by the employer or department. See Appendix A for details.

## 5. Selection and Types of Respirators

Departments, with the assistance of EH&S, shall identify and evaluate respiratory hazard(s) in the workplace for each operation, process, or work area where respiratory hazards may be present in routine operations or in emergencies. This evaluation shall include a reasonable estimate of employee exposures to respiratory hazard(s) and identification of the contaminant. Where employee exposure cannot be identified or reasonably estimated, the atmosphere shall be considered to be immediately dangerous to life and health (IDLH).

There are two basic classes of respirators:

### **Air purifying:**

Air-purifying respirators use filters or sorbents to remove contaminants from the air. They range from simple disposable masks (N95s, P100s) to powered air-purifying respirators (PAPR's). Air-purifying respirators do not supply oxygen and shall not be used in oxygen-deficient atmospheres or in areas that are immediately dangerous to life or health (IDLH).

### **Atmosphere supplying:**

Atmosphere-supplying respirators are designed to provide breathable air from a clean air source other than the surrounding contaminated work atmosphere. They range from supplied-air respirators (SAR's) to self-contained breathing apparatus (SCBA's).

Selection of the type of respirator to be used will be based on the potential hazard involved. Essential information which may be obtained and evaluated when selecting the type of respirator includes:

- The potential of working in an oxygen deficient atmosphere;
- The hazardous airborne contaminants to which employees may be exposed;
- The form of the contaminants gas, vapor, dust, mist, fume, or combination;
- The concentration of expected hazardous airborne contaminants;



- IDLH levels and permissible exposure limits (PEL's) for the contaminants;
- Flammable limits, odor thresholds, and other properties of the contaminants;
- Recommended protection factors for specific types of respirators;
- The likelihood of obtaining a proper fit;
- Comfort of the user relative to heat, humidity, and other conditions;
- Compatibility with heavy equipment and chemical protective clothing; and
- Availability of essential supplies, such as cartridges, and repair parts.

Once the general type of respirator has been selected for the job, the make, model and size will be chosen from those approved by the National Institute for Occupational Safety and Health (NIOSH) for the contaminant involved.

#### Gas and Vapor Protection

For protection against gases and vapors, one of the following respirators shall be provided;

- An atmosphere-supplying respirator; or
- An air-purifying respirator

#### Particulate Protection

For protection against particulates, one of the following respirators shall be provided:

- An atmosphere-supplying respirator; or
- An air-purifying respirator equipped with a filter certified by NIOSH under 30 CFR part II as a high efficiency particulate air (HEPA) filter, an air purifying respirator equipped with a filter certified for particulates by NIOSH under 42CFR part 84; or
- For contaminants consisting primarily of particles with mass median aerodynamics diameters (MMAD) if at least 2 micrometers, an air-purifying respirator equipped with any filter certified for particulates by NIOSH.

#### Biological Exposure Control

For protection against biological hazards, one of the following respirators shall be provided:

- An atmosphere-supplying respirator; or
- A NIOSH approved N95 or greater particulate respirator; or
- A powered air purifying respirator (PAPR) in combination with a high efficiency particulate air (HEPA) filter, and head cover or hood.

#### Respirators for IDLH Atmospheres

For use within an IDLH atmosphere, one of the following shall be provided:

- A full facepiece pressure demand Self Contained Breathing Apparatus (SCBA) certified by NIOSH for a minimum service life of thirty minutes; or
- A combination full facepiece pressure demand supplied-air respirator (SAR) with auxiliary self-contained air supply.



- Respirators provided only for the escape from IDLH atmospheres shall be NIOSH-Certified for escape from the atmosphere which they will be used.
- All oxygen-deficient atmospheres shall be considered IDLH.

## 6. Medical Evaluation

Using a respirator may place a physiological burden on employees or students which vary with the type of respirator work, the job and workplace conditions in which the respirator is being worn and the medical status of the user.

### A. General Requirements

A medical evaluation is required by OSHA's Respiratory Protection Standard ([29 CFR 1910.134](#)) for employees or students who wear respirators. OSHA requires that the medical evaluation consist of, at minimum, completion of the Respiratory Medical Evaluation Questionnaire by the employee and review of the questionnaire by a licensed health care professional. This requirement is intended to ensure that employees are physically able to wear a respirator.

### B. Medical Evaluation Procedures

Employees or students shall obtain and complete a confidential medical evaluation questionnaire from Medical Evaluators identified by their department or EH&S.

The Respiratory Medical Evaluation Questionnaire shall be administered confidentially during the employee's normal working hours or at a time and place convenient to the employee. If the employee or student needs assistance in filling out or understanding the questionnaire, the Medical Evaluator will provide assistance, so as to maintain confidentiality.

The Medical Evaluator shall provide a written recommendation regarding the employee's ability to use the respirator including any limitations on respirator use related to the medical condition of the employee, or relating to the workplace conditions in which the respirator will be used, including whether or not the employee is medically able to use the respirator. The Medical Evaluator shall also identify the need, if any, for follow-up medical evaluations. The employee or student should bring a copy of the clearance letter to the fit-tester. Medical evaluation is required **annually** before fit testing.

### C. Follow-up Medical Examination

The follow-up medical evaluation shall include any medical tests, consultations or diagnostic procedures that the Medical Evaluator deems necessary to make a final determination for respirator usage.



## D. Additional Medical Evaluations

Additional medical evaluations shall be required if:

- An employee or student reports medical signs or symptoms that are related to the ability to use a respirator;
- The Medical Evaluator, the respirator user's own health care provider, the supervisor or representative from EH&S recommends a re-evaluation;
- Information from the Respiratory Protection Program, including observations made during fit testing and program evaluation, indicates a need for re-evaluation; or
- A change occurs in workplace conditions (e.g., physical work effort, protective clothing, and temperature) that may result in substantial increase in the physiological burden placed on the user.

## 7. Fit Testing Procedures

After receipt of medical clearance from the Medical Evaluator and before an employee or student may be required to use any respirator with a negative or positive pressure tight-fitting facepiece, the employee shall be fit tested with the same make, model, style, and size of respirator that will be used. The employee or student should bring a copy of the clearance letter to the fit-tester.

EH&S or their designee shall provide qualitative or quantitative respirator fit tests in accordance with the OSHA-accepted protocol found in [29 CFR 1910.134, Appendix A](#), the OSHA Respirator Standard for employees prior to initial use of the respirator, whenever a different respirator facepiece (e.g., size, style, model, make) is used and at least annually thereafter.

An additional fit test shall be conducted **annually** or whenever any of the following occurs:

- Significant weight change (10 pounds or more);
- Significant facial scarring in the area of the facepiece seal;
- Significant dental changes;
- Reconstructive or cosmetic surgery;
- Use of medications that can cause significant changes in facial features; or
- Other conditions that may interfere with the facepiece seal.

Fit tests will not be conducted on respirator users who have facial hair that will affect the seal between the respirator and skin. Respirator users will not be cleared to wear a respirator until a successful fit test has been performed.





## 8. Maintenance and Care of Respirators

Respirators shall be kept in proper working condition by performing cleaning and disinfection, proper storage, inspection and repair according to manufacturer's instructions.

### A. Cleaning and disinfection

Employees and students shall be provided with a respirator that is clean, sanitary and in good working order. Employees and students shall clean and disinfect assigned respirators based on the manufacturer's recommendations. The respirators shall be cleaned and disinfected at the following intervals:

- Respirators issued for the exclusive use of a user shall be cleaned and disinfected as often as necessary to be maintained in sanitary conditions;
- Respirators issued to more than one employee shall be cleaned and disinfected before being worn by a different individual;
- Respirators maintained for emergency use shall be cleaned and disinfected after each use;
- Respirators used in fit testing and training shall be cleaned and disinfected after each use; and
- Disposable particulate respirators shall be used exclusively by one user and shall be discarded at the end of their service life as recommended by the manufacturer.

### B. Storage

Respirators shall be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals. They shall also be stored to prevent deformation of the facepiece and exhalation valve. Respirators used specifically for emergencies shall be kept accessible to the work area, stored in compartments or in covers that are clearly marked as containing emergency respirators and in accordance to the manufacturer's instructions.

### C. Inspection

Respirators shall be inspected before each use and during cleaning. Respirators used in emergency situations shall be inspected in accordance with the manufacturer's recommendations, and be checked for proper function before and after each use. Emergency escape-only respirators shall be inspected before being placed in the work area for use.

The inspection shall include the following:

- Respirator function



- Tightness of connections,
- The condition of the various parts including;
- The facepiece
- Head straps
- Valves
- Connecting tube
- Cartridge, canister or filters
- Elastomeric parts shall be checked for pliability and signs of deterioration.

#### D. Repairs

Respirators that fail an inspection or are found to be defective shall be removed from service. The respirators shall either be discarded and replaced or repaired and adjusted in accordance with the following procedure:

- Repairs and adjustments are to be made by a competent person and shall use only respirator manufacturer's NIOSH-approved parts designed for the respirator;
- Repairs shall be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed; and
- Reducing and admission valves, regulators, and alarms shall be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

## 9. Training and Recordkeeping

#### A. Training

Employees or students using a half-face or full-face elastomeric respirator shall complete the Respiratory Protection Training (online or in-person). Employees using a filtering facepiece respirator shall review the Filtering Facepiece Training document. The training must be completed prior to using a respirator in the workplace. The following items are identified during the respirator training:

- Why a respirator is necessary and how improper fit, usage, or maintenance can compromise the protective effect of the respirator;
- Limitations and capabilities of the respirator;
- Components of the respirator: head straps, facepiece seal, valves, filters/cartridges;
- Pre-use inspection and evaluation;
- How to properly don and doff a respirator;
- Positive and negative pressure fit check procedures;
- When and how to change out the filters/cartridges;
- Factors that could affect the fit of the mask;
- Post-use inspection;



- Proper maintenance and storage of the respirator;
- Cleaning and disinfecting the respirator;
- How to recognize medical signs and symptoms that may limit or prevent effective use of respirators; and
- The general requirements of the OSHA Respiratory Protection Standard.

## B. Annual Retraining

Retraining shall be conducted at least annually or when the following situation occurs:

- Changes in the workplace or the type of respirator render previous training obsolete;
- Inadequacies in the user's knowledge or use of the respirator indicate that the user has not retained the requisite understanding or skill; or
- Any other situation arises in which retraining appears necessary to ensure safe respirator use.

## C. Recordkeeping

### **Fit Test and Training Records**

EH&S shall maintain records of medical clearance, respirator training and fit-testing for all employees and students fit tested. Fit test records shall be retained until the next fit test is administered.

### **Medical Evaluations**

Records of medical evaluations shall be retained by the Medical Evaluator for the duration of employment and 30 years thereafter.

## **Appendix A:**

# **Voluntary Use of Respiratory Protection**

### **Purpose:**

The Respiratory Protection Program at the University of Colorado Boulder (CU Boulder) is intended to protect employees and students against recognized health hazards. However, some employees and/or students may be irritated by the presence of non-hazardous air contaminants (such as pollen or dust). When use of a respirator will help to alleviate irritation and when the filtering facepiece respirator itself is judged to pose no additional risk to the wearer, CU Boulder employees and students will be allowed to



voluntarily use respirators for comfort reasons. Voluntary use of respirators is only applicable if an exposure assessment by EH&S has been conducted, the Permissible Exposure Limit (PEL) is not exceeded, and respirators are not required by the employer or department. This guidance describes responsibilities and procedures for obtaining approval for voluntary respirator use.

### **Exceptions:**

Employees and students that choose to voluntarily wear elastomeric (half- and full-face respirators with removable filters or cartridges) or powered air purifying respirators (PAPR) must enroll in EH&S's Respiratory Protection Program. Please email [ehsohs@colorado.edu](mailto:ehsohs@colorado.edu).

### **Responsibilities and Procedures:**

#### **Departments and Supervisors:**

- Contact EH&S when employees and/or students inquire about the voluntary use of respiratory protection
- Ensure appropriate NIOSH-approved filtering facepiece respirators based on EH&S recommendations
- Ensure that use of the respirators does not interfere with the user's ability to work safely
- Maintain documentation that all voluntary respirator users have reviewed the Filtering Facepiece Respirator Training handout

#### **Voluntary respirator users:**

- Read and understand the information contained in the Filtering Facepiece Respirator Training handout
- Only use respirators for non-hazardous conditions (contact EH&S if hazardous conditions are suspected)
- Only use NIOSH-approved filtering facepiece respirators based on EH&S recommendations
- Follow manufacturer instructions for use and storage of respirators
- Report issues to supervisors and EH&S

#### **EH&S:**

- Conduct appropriate risk-assessments to determine that respiratory health hazards are not present in areas where respirators are used voluntarily
- Provide guidance on respirator selection
- Provide Filtering Facepiece Respirator Training handout
- Offer fit-testing for filtering facepiece users
- Enroll voluntary users of elastomeric and PAPRs in the Respiratory Protection Program
- Conduct periodic reviews of departmental practices of respirator use, storage, and documentation

## **Appendix B:**



# Filtering Facepiece Respirator Training for Voluntary Use

## 1. What is a Filtering Facepiece Respirator (FFR)?

- A disposable air-purifying respirator certified by the National Institute of Occupational Safety and Health (NIOSH). Common types include:
  - N95 – Filters at least 95% of airborne particles. Not resistant to oil.
  - N100 – Filters at least 99.97% of airborne particles. Not resistant to oil.
  - P100 – Filters at least 99.97% of airborne particles. Strongly resistant to oil.
  - Some FFRs also contain additional nuisance level organic vapor filters.
- EH&S will provide guidance on selection of appropriate FFRs

## 2. Capabilities and Limitations of FFRs

- FFRs **ONLY** filter out particulate contaminants
  - FFRs do not protect you from chemical vapors or gases
- FFRs cannot be used in oxygen-deficient atmospheres
- FFRs are disposable – one time use only
- Beards or other facial hair may interfere with the direct contact between your face and the sealing surface of the respirator

## 3. Effective Use of FFRs





- The effectiveness of FFRs relies on how well it seals to the user's face
- To ensure it is effective:
  - Inspect the respirator for damage. Check for rips, tears, and that the straps are securely attached.
  - Conduct a seal-check **every time** you put the respirator on
- Students and employees with pulmonary function issues or experience difficulty breathing, dizziness, or irritation when wearing a FFR are encouraged to discontinue using it and contact EH&S
- Students and employees with latex allergies should carefully choose latex-free models
- Read and follow all instructions provided by the manufacturer on the use and storage of FFRs

## 4. Fit-testing of FFRs

- EH&S can provide qualitative fit-testing for students and employees to ensure a proper fit. Contact [ehsohs@colorado.edu](mailto:ehsohs@colorado.edu) for scheduling.

## 5. Self-fitting and Seal Checking Procedures



<p>1) Hold the respirator in one hand, with the nose piece at the fingertips and let the head straps hang loosely in front of the respirator.</p>	
<p>2) Place respirator under the chin, with the nosepiece up.</p> <p>While holding the respirator with one hand, pull the top strap over your head, resting it at the top back of your head.</p> <p>Pull the bottom strap over your head, and place it around your neck, below your ears.</p>	
<p>3) Using <u>both</u> hands, mold the nose piece to the shape of your nose by pushing inward with your fingertips.</p> <p>Note that pinching the molding piece with 1 hand will likely result in less effective respirator fit.</p>	
<p>4) <b>Seal-check:</b> cover respirator completely w/ both hands, and exhale sharply.</p> <p>If air blows on your face or eyes, readjust the respirator according to Steps 3 &amp; 4. Do not use respirator until you pass the seal-check (no leakage).</p>	

## 6. Contact Information

- EH&S Occupational Health and Safety Group: [ehsohs@colorado.edu](mailto:ehsohs@colorado.edu)
- EH&S main phone number: 303-492-6025