University of Vermont

Department of Environmental Health and Safety
Occupational Health and Safety Office

321 Ryan Street
Essex, Vermont 05452

RESPIRATORY PROTECTION PROGRAM

In accordance with
OSHA 29 CFR 1910.134 Respiratory Protection
NIOSH 42 CFR 84 Approval of Respiratory Protective Devices
ANSI Z88.2 2015 The American National Standard Practices for Respiratory Protection

REVISED AND DISTRIBUTED BY:

THE UNIVERSITY OF VERMONT
DEPARTMENT OF ENVIRONMENTAL HALTH AND SAFETY
OCCUPATIONAL HEALTH AND SAFETY OFFICE

REVIEWED BY:

DEPARTMENT OF ENVIRONMENTAL HALTH AND SAFETY
OCCUPATIONAL HEALTH AND SAFETY OFFICE

Occupational Health and Safety Manager
Occupational Health Program Coordinator

January 2026

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EMERGENCY AND ASSISTANCE

EMERGENCY TELEPHONE NUMBERS

No work will be performed where an emergency cannot be immediately observed and/or prompt rescue assistance summoned.

A rescue plan shall be in place prior to beginning any work where a hazard exists. The rescue plan must be well thought out and documented in a Fire Emergency Response Plan. All individuals involved must thoroughly understand the plan. Prompt rescue will be provided for personnel.

FIRE – POLICE – RESCUE – EMERGENCY MEDICAL SERVICE……. 9-1-1

Dial 911 and tell them you are at the University of Vermont. Provide them with your building address, building name, and room number as well as the details of your emergency.

CALL IMMEDIATELY FOR ANY EMERGENCY
INCLUDING CHEMICAL SPILL, FIRE, INJURED,
TRAPPED, OR SICK PERSON.

UVM Police Services……(802) 656-3473
Fire, Police, Rescue, Emergency Medical Service

UVM and OTHER ADMINISTRATIVE OFFICES

Occupational Health and Safety Office……(802) 656-7233
Department of Environmental Health and Safety ohso@uvm.edu

Service Operations Support……..(802) 656-2560
Facilities Management sos@uvm.edu

Department of Risk Management……(802) 656-3242
(Accident investigations, insurance services) risk.management@uvm.edu

Center For Health and Wellbeing ……(802) 656-3350
(UVM Student Medical Consultation and Evaluation) health@uvm.edu

UVM Approved Contracted Vendors

Champlain Medical Urgent Care ……(802) 448-9370
(UVM Employee Medical Consultation and Evaluation)

UVM Respiratory Protection Program Administrator
Occupational Health Program Coordinator ……....ohealth@uvm.edu

PROGRAM STATEMENT

I. Purpose

The University of Vermont (UVM), Department of Environmental Health and Safety (EHS), Occupational Health and Safety Office (OHSO) are dedicated to providing safe work facilities for UVM faculty and staff, students, and visitors, including contractors and consultants (UVM Personnel) and complying with federal and state occupational health and safety standards.

All UVM Personnel, including administrators and union representatives, share a responsibility to reduce hazards in the workplace.

The following Respiratory Protection Program (RPP) has been developed by OHSO in an effort to ensure safe work practices for UVM Personnel where there are known or potential exposure to airborne pollutants and respiratory hazards. This RPP also supports UVM Personnel who choose to voluntarily use and wear a respirator in environments where an assessment has been determined that no respiratory hazards exist.

Occupational workplace hazards must first be controlled through engineering controls where feasible. When engineering controls are not feasible or incapable of eliminating the hazard, then administrative controls, training, and personal protection equipment (PPE), such as a respirator, must be implemented.

II. Standards

This written program is a means to analyze elevated work tasks and determine appropriate respiratory protection and respirator selection against occupational workplace hazards in accordance with regulations set by Vermont Occupational Safety and Health Administration (VOSHA) and U.S. Department of Labor Occupational Safety & Health Administration (OSHA):

OSHA 29 CFR 1910.134 Respiratory Protection
NIOSH 42 CFR 84 Approval of Respiratory Protective Devices
ANSI Z88.2 2015 The American National Standard Practices for Respiratory Protection

Both OSHA's General Industry (29 CFR 1910) and Construction Industry (29 CFR 1926) respiratory protection standards may simultaneously apply to the same work site and job tasks.

III. Scope

A respirator is a device and type of PPE designed to protect an individual from respiratory hazards, such as inhaling dangerous substances, chemicals or infectious particles.

This RPP applies to all UVM Personnel who are required to wear a respirator during normal assigned job tasks, work operations, course of study in a classroom, research in a laboratory, or workshop, and during some non-routine or emergency operations. This RPP is intended to ensure that all UVM Personnel who use respirators have had their health evaluated and the results documented. UVM Personnel participating in this program do so at no cost to themselves.

This program also applies to any UVM Personnel who choose to wear a respirator in environments where it has been determined that respirators are not required or recommended under the Voluntary Use definition of OSHA 1910.134.

Respirators will be selected and used to protect UVM Personnel who have the potential to encounter identified and potential respiratory hazards within the workplace or conduct work involving hazards identified during a Hazard Assessment. UVM Personnel required to wear a respirator will be required

to participate in this RPP. UVM Personnel should contact their supervisor for assistance in hazard recognition and determining the need for respiratory protection.

Environments that might require the use of a respirator could include areas that may be oxygen deficient, such as a confined space, or atmospheres that may be contaminated with toxic particulates, vapors or gases (i.e. asbestos, silica, pesticides, certain lab chemicals, paint fumes etc.).

This RPP does not apply to UVM divers that use self-contained underwater breathing apparatus (SCUBA), outside contractors, or other non-UVM employees working on UVM property who are not part of a UVM-funded research program.

IV. Roles and Responsibilities

To successfully achieve UVM's goal of Academic Excellence, individual members of our campus community must understand their roles and accept responsibility as described in UVM policies and plans. Please use the resources of UVM's safety websites to increase your personal awareness and minimize your risk of injury both on and off campus. More information can be found at Division of Safety and Compliance | The University of Vermont and UVM Policies | The University of Vermont.

We look to all members of the University community to do their part in helping to meet this goal.

A. Department Administration

1. Maintain and update Design Guidelines requiring that projects be designed according to current state and federal standards and that hazard elimination, engineering controls, and administrative controls, for occupant use and maintenance work be designed into projects wherever feasible.
2. Provide administrative and financial support for this RPP within individual units.
3. Ensure that processes of respiratory protection, to include respirator devices, are provided and maintained within the department.
4. Support disciplinary action in the event that proper procedures are neglected and/or obviously not followed.

B. Environmental Health and Safety

1. Designate and empower individuals who will act as competent and/or qualified person(s) who will be responsible for the preparation and implementation of this RPP.
2. Ensure that employees who will act as competent and/or qualified people are adequately trained and/or qualified.
3. Ensure this RPP is implemented and maintained within the departments.
4. Consult with outside entities on processes of respiratory protection, to include respirator devices, as needed.
5. Prepare a hazard analysis list and annually review and revise the material to meet current OSHA regulations.

C. Program Administrator and Supervisor

The designated Program Administrator is the EHS Occupational Health and Safety Program Coordinator(s). In addition, each affected Department/College/Unit shall designate a Program Supervisor(s) and list the designee(s) in their Site-Specific Respiratory Protection Plan. A blank template of a Site- Specific Plan is available in *Appendix A*.

1. Ensure this RPP is implemented and maintained within the departments, periodically monitor respirator use to ensure procedures are being followed in accordance with the elements of this program.
2. Assist in identifying work processes, tasks, or areas that require employees to wear respirators.
3. Assist in conducting a respiratory hazard assessment of a job task or process to determine the appropriate type of respirator.
4. Assist in completing Respirator Use Request and Hazard Assessment forms.
5. Assist in conducting and/or arranging annual training and annual fit testing.
6. Monitor respirator use, storage, cleaning, and maintenance of respirators.
7. Administering the medical surveillance section of this RPP.
8. Evaluate this RPP on an annual basis and update as needed.

D. Managers and Supervisors

Managers and Supervisors are responsible for implementing this RPP within their designated unit, laboratory, or department. Supervisors include professors, laboratory supervisors, and principal investigators.

1. Ensure this RPP and a Site-Specific Plan are implemented and maintained within the departments, periodically monitor respirator use to ensure procedures are being followed in accordance with the elements of this program.
2. Identify and document job classifications, tasks, and work processes within their unit or department have potential respiratory hazards that will require a hazard assessment every three (3) years. Also, when new hazards develop, environmental factors or work procedures change, a hazard assessment must be conducted.
3. Determine which job tasks or work processes for which engineering controls are not effective, not available, or not feasible.
4. Ensure a qualified individual evaluates and documents the level of a respiratory hazard prior to respirator selection and periodically during working conditions.
5. Ensure and document that employees are informed, trained, and provided with the proper and adequate PPE, to include appropriate respirator types and sizes as well as any additional accessories and filter/cartridge/canister selection, to be protected from identified and potential hazards.
6. Ensure required PPE, to include respirators, is being properly used, inspected, maintained, and stored by affected UVM Personnel when and where hazards exist in the workplace for which they are responsible.
7. Coordinate the corrective actions required of new or emerging respiratory hazards brought to their attention by employees.
8. Completing the Hazard Assessment (*Appendix B*) and Respirator Use Request (*Appendix C*).
9. Complete a First Report of Injury or Incident Report and produce any additional documentation needed to investigate and work-related injuries and illnesses.

E. UVM Personnel

UVM Personnel include UVM faculty and staff, students, and visitors, including contractors and consultants.

1. Comply with all sections of this RPP and any further safety recommendations provided by a Manager or Supervisor and/or EHS regarding respiratory protection and respirator use.

2. Complete any required respiratory protection training and request further instructions if unclear.
3. Conduct assigned tasks in a safe manner and wear all assigned PPE, to include respirators, as directed by training and manufacturer's recommendations.
4. Clean, maintain, and appropriately store PPE, to include respirators, according to manufacturer's recommendations or best industry practice.
5. Report to a supervisor immediately if an assigned respirator no longer fits, it becomes uncomfortable to wear, of any damaged or defective respirators.
6. Inform a Supervisor, EHS, or the Program Administrator of any respiratory hazards that are not adequately addressed in the workplace and ask for assistance in hazard recognition and determining the need for respiratory protection.
7. Report to the supervisor any new hazards, unsafe or unhealthy work conditions, and job-related injuries and illnesses to the supervisor immediately.

INFORMATION AND TRAINING

Personal Protective Equipment (PPE) includes all clothing and work accessories designed to protect employees from workplace hazards. PPE should not replace but work in conjunction with engineering, administrative, or procedural controls for safety. UVM Personnel must wear PPE, to include respirators, as required and when instructed by a Hazard Assessment, established Job Hazard Analysis (JHA), supervisor, and/or OHSO. Additional information and requirements may also be obtained from:

- UVM Personal Protective Equipment Program
- Safety Data Sheets (SDS) for chemicals and/or products
- Manufacturer's instructions and product descriptions
- Standard Operating Procedures (SOP)

UVM Employees and Student Employees that are required to wear a respirator during normal work operations or working in a classroom, research laboratory, or workshop, and during some non-routine or emergency operations shall participate in this program do so at no cost to themselves.

A department or sponsoring college where students, whose directory designation indicates students, are required to wear a respirator during normal work operations or course of study in a classroom, research laboratory, or workshop, and during some non-routine or emergency operations are required to indicate hazards and controls, including required PPE, such as a respirator. The department or sponsoring college may provide hazard controls and respiratory protection from operating funds or student fees or require students to obtain the specified PPE. Common communal PPE, such as reuseable elastomeric respirators, will be provided by the sponsoring department or college.

The department manager and supervisors, and instructor of record for a course, or designee, are responsible for ensuring that UVM Personnel are familiar with and properly use required protective controls and devices.

Training is an annual requirement for all UVM Personnel who are required to wear a respirator to conduct their work tasks. Training may be administered online or in person by a competent person(s) as long as a hands-on portion is incorporated. Managers and Supervisors will ensure UVM Personnel within their unit or department are trained annually or more often as needed.

Prior to conducting work requiring the use of a respirator, UVM Personnel must be trained to know the following:

- The potential hazards associated with work tasks,
- When a respirator is necessary,

- What type of respirator is required,
- How to properly don, doff, adjust, and wear a respirator,
- The limitations and capabilities of the respirator,
- Proper care, maintenance, storage, service life, and disposal of the respirator,
- How to inspect, use, and check the seals of the respirator,
- Where applicable, how to conduct a positive and negative pressure check (User Seal Check) specified in Appendix B-1 of OSHA 29 CFR 1910.134,
- How to use the respirator effectively in emergency situations, including situations in which the respirator malfunctions,
- How improper fit, usage, or maintenance can compromise the effectiveness of the respirator.

Additionally, UVM Personnel must be trained in the following:

- How respiratory systems work,
- Respiratory hazards and how they affect the respiratory system,
- Purpose of respiratory protection,
- Different types of respirators and their purposes,
- Proper fit, inspection, cleaning, and disinfecting, and storage of respirators,
- How to completely disassemble and assemble a respirator,
- Medical evaluations,
- How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators,
- Engineering and administrative controls,
- The general requirements of the OSHA Respirator Standard 29 CFR 1910.134.

To successfully complete the training session, the UVM Personnel must be able to demonstrate the above-mentioned information, show competency, and is aware of the factors and limitations concerning the need for and proper use of respiratory protection.

Retraining will be required when it is believed an employee does not have the understanding and/or skill required in proper use, care, and maintenance of an assigned respirator. Also, retraining may be required if the following occurs:

1. Changes in the workplace show previous training does not meet requirements,
2. Employee changes position or department,
3. If the type of respirator available changes,
4. Other indications that employee(s) inadequacy in knowledge or information have not been retained.

Whenever a respirator is used, employee comfort should be considered. Consider selecting respirators with adjustable features. There should not be pain or immediate physical discomfort when utilizing selected respirators. Manufacturer's manuals or instructions should be made available and followed for proper usage.

Information and training may be provided or arranged by OHSO or the Academic and Research Safety Office (Lab Safety) to any unit or individual requesting guidance or training to satisfy the implementation of this RPP.

VOLUNTARY RESPIRATOR USE

Voluntary Respirator Use means:

(1) An exposure assessment has been conducted, and it has been determined that a respirator is NOT required to reduce exposures below their current levels,
(2) The permissible exposure limits are not being exceeded.
(3) The Program Administrator or other qualified person designated does not require, recommend, encourage or suggest that a respirator be used.

The Voluntary Use under OSHA 29 CFR 1910.134(c)(2) and of this RPP applies to UVM Personnel who wish to wear disposable filtering facepiece, a.k.a. dust mask (commonly called an N95), respirators for comfort reasons after it has been determined that no respiratory hazards exist, and respiratory protection is not required or recommended. When UVM Personnel may be irritated by the presence of non-hazardous air contaminants, such as dust, pollen or dander, the use of a respirator will help alleviate irritation, and when a respirator itself is judged to pose no additional risk to the wearer, a UVM Personnel is permitted to voluntarily use a respirator.

Respirator use is not considered voluntary if a Program Administrator, Manager or Supervisor, or other qualified person recommends a respirator be used when working in certain locations or performing certain procedures. However, it is considered voluntary use, for example, if a lab instructor hands out N95 respirators to students and allows them to be worn during a procedure, if a hazard assessment has shown the absence of a hazardous atmosphere.

UVM Personnel who desire to use a disposable filtering facepiece respirator for comfort reasons must first notify their Supervisor of this request. The Supervisor should assist the employee in completing and submitting a Respirator Request Form. Respirator Request Form can found in *Appendix C* or can be filled out online at Respirator Request Form. The Supervisor should assist the employee in complying information on the job task and contaminant(s) of concern.

The Program Administrator working in collaboration with EHS staff will review the completed form(s) and determine if a hazard assessment of the procedure or work area is required. A hazard assessment allows a determination to be made as to whether or not UVM will approve an individual for "Required Respirator Use" or "Voluntary Respirator Use." “Voluntary Respirator Use” will be approved if the work process involves a non-hazardous substance or a contaminant at a concentration below the occupational exposure limit, and if wearing a respirator poses no health risk to the employee.

Voluntary use of disposable filtering facepiece respirators for biological agents will be determined by the UVM Biosafety Officer on a case-by-case basis and will depend on workplace practices, engineering controls, exposure routes, and aerosolization potential of the agent.

Voluntary use of disposable filtering facepieces respirators requires compliance with the Medical Evaluation, Fit Testing, and Annual Training Requirement sections of this program.

To obtain approval for Voluntary Respirator Use UVM Personnel must:

1. Complete an OSHA respirator medical questionnaire and obtain medical clearance from a PLHCP.
2. Complete the online training and read OSHA 29 CFR 1910.134 Appendix D.
3. Report any changes, questions or concerns in your work environment that may affect respirator use to the supervisor.

UVM Personnel under the Voluntary Respirator Use of this RPP can request a fit test by contacting OHSO.

UVM Personnel should understand that disposable respirators are a one-time use respirator, must be inspected before each use to be free of defects, should not be shared and ensure that any disposable

respirator worn will not be dirty or contaminated. Additionally, it needs to be understood that reusable respirators shall be cleaned, stored and maintained so that its use does not present a health hazard to the user.

RECORDKEEPING

This section requires the employer to establish and retain written information regarding medical evaluations, fit testing, and the respirator program. This information will facilitate UVM Personnel involvement in the respirator program, assist the employer in auditing the adequacy of the program, and provide a record for compliance determinations by OSHA.

The Program Administrator(s) will keep records submitted for all UVM Personnel covered in this program including completed:

- respirator request forms,
- respirator selection,
- hazardous assessments,
- potential/actual exposure to contaminants,
- exposure monitoring results (if conducted),
- medical clearances provided by a PLHCP,
- training records, and
- fit test results.

The Supervisor will document repair and maintenance of respirators including the dates of respirator repairs, the name of the respirator user, the type of repair and parts used.

For laboratory use of respirators, copies of such records will be maintained in the Lab Safety Notebook.

During workplace safety audits and upon request, a designated, qualified individual from EHS will periodically inspect on-site procedures, equipment and program documentation. The UVM Personnel record is available to the respective UVM Personnel, the immediate Supervisor, and any individual who has received approval from EHS and the UVM Personnel.

The respirator program will include an annual evaluation to be reviewed by the Program Administrator. The program may be reviewed as necessary and at any time. A written copy of this program is available online and provided to all UVM Personnel enrolled in this program or who wishes to see it.

Training records will be maintained within UVM Personnel training files within the department the UVM Personnel works in. Applicable training records can be filed and stored within the OHSO. The training record must include the date and time of training, name of trainer/instructor, and name of UVM Personnel.

ENGINEERING & ADMINISTRATIVE CONTROLS

UVM Personnel may be exposed to respiratory hazards during routine job tasks and responsibilities. These hazards may include, but not limited to, particulates (dusts, fogs, fumes, mists, smoke, sprays), gases and vapors, and biological aerosols. Substitution, engineering, and administrative controls must be used to the extent feasible to minimize exposure to and prevent injury or illness from respiratory hazards. These methods are effective because they physically change the work environment to reduce known or potential contaminants and hazards. Such controls include, but are not limited to:

- Substitute less hazardous substances (i.e. latex paints vs. oil-based paints).
- Isolate or enclose the work process or of employees (i.e., seal the doorway to where work is being performed).

- Use local exhaust, general dilution, and air filtering ventilation (i.e., chemical fume hoods, building exhaust, and biological safety cabinets).
- Change the work process (i.e. wet mop vs. dry sweep).

However, such controls are not always feasible or capable of eliminating the hazard(s). Therefore, appropriate respirators are worn to protect the user from airborne hazard(s). PPE includes all apparel and work accessories designed to protect employees from workplace hazards. PPE, such as a respirator should not be used as a substitute for engineering, work practices, and/or administrative controls to protect employees from workplace hazards. Respirators should be used in conjunction with permanent protective measures, such as engineered ventilation, substitutions of less hazardous chemicals, and prudent work practices.

To ensure the administrative and engineering controls are sufficient to protect the UVM Personnel health for a particular hazard the affected Department is responsible for contacting EHS.

HAZARD ASSESSMENT

A Hazard Assessment, or Job Hazard Analysis (JHA), is a formalization of identifying and documenting any known or potential hazards and making a reasonable estimate of the occupational exposures anticipated to occur as a result of those hazards, including those likely to be encountered in reasonably foreseeable emergency situation. Certain activities may require the use of special work procedures, controls, or PPE, such as a respirator.

Prior to the selection of respiratory protection, a Hazard Assessment must be completed and UVM Personnel must be aware of the potential respiratory hazards within a work area. When conducting a hazard assessment, a task is investigated, and the known and potential hazards associated with the task are determined. The information will be used to indicate whether a respirator is required or not required for the activity or job task(s). This allows the proper selection of respirators for each work task that will protect UVM Personnel from the identified hazards. The data and information shall be organized, documented, and available to UVM Personnel.

The hazard assessment may be conducted of a single individual, a single task, or a group of individuals if all are performing an identical task. The Manager or Supervisor is responsible for initial assessment and to reassess the workplace hazards as needed, such as (1) when new equipment or processes are implemented, (2) after an accident or injury has occurred, (3) the suitability of previously selected PPE needs to be reevaluated, of (4) every three years following the initial assessment.

The hazard assessment will include a review of the work process to determine where potential exposures to respiratory hazards may occur. This may involve observations of the work task, talking with personnel, or a walkthrough or survey of the workspace. Manufacturer's Safety Data Sheet(s) (SDS) and any other standard operating procedure, policy or activity-related information for the contaminant of concern, if applicable, must be included in the Hazard Assessment.

Scheduling an initial or re-assessment must go through department manager(s) and/or supervisor(s). Individuals or groups that will be observed should be notified prior to beginning the assessment. Work and tasks under observation should be conducted by employee(s) as usually performed and as trained. The assessment will determine if the use of personal protective equipment (PPE) should be implemented or modified.

Other tools in addition to the hazard assessment that are available to UVM Personnel for PPE selection include:

1. Standard Operating Procedures (SOP) – written procedures for a work task, including roles and responsibilities for every person involved in the work, specify clear and simple instructions for the task, and include things can go wrong (i.e. "what if" scenarios). An SOP is also a useful training tool for new personnel.
2. Job Hazard Assessment (JHA) – is conducted and written to identify each step in a job task and all of the potential hazards. The results of the JHA can be used to determine the appropriate PPE for the task.
3. Use the Chemical Use and Planning Form for work involving chemicals.
4. If the work includes the use of a machine, instrument, or other piece of equipment, consult the manufacturer's manual and instructions for PPE recommendations.

The Hazard Assessment can be complete online at Hazard Assessment Form, or a hardcopy option of the form can be found in *Appendix B*.

EXPOSURE MONITORING

As part of the Hazard Assessment, a Manager or Supervisor must make a reasonable estimate of the anticipated occupational exposures to respiratory hazards, including those likely to be encountered in reasonably foreseeable emergency situations. Immediately Dangerous to Life or Health (IDLH) conditions must be assumed where sources of airborne hazards are evident, and employee exposures have not been or cannot be estimated.

Three options are used to estimate employee exposure:

(1) Initial Assessment - this is the use of data obtained from initial sampling utilizing methods appropriate for contaminants(s) collection for personal exposure monitoring. Request an Initial Assessment if no data is available.
(2) Historical Data - this is the use of data obtained from minimum of: utilize sampling methods appropriate for contaminants(s), sampling presenting the worst-case exposures, and represent enough shifts and operations to determine the range of exposure.
(3) Use of Objective Data - this is the use of data obtained from industry studies, trade associations, or from tests conducted by chemical manufacturers.

When using Initial Exposure and Historical Data, a periodic exposure monitoring plan must be in place to ensure exposure levels are acceptable. The affected department or college is responsible for initiating and maintaining that plan with the support of the Program Administrator(s).

Experienced professional judgement and best industry standards should be utilized when sampling for potential respiratory hazards. Additionally, sampling only provides “snapshot” information only for the moment in time in which the sampling occurred.

Upon request EHS shall provide a sampling plan and oversight for the collection of samples. Sampling may consist of passive badge samples or active air samples. Experienced professional judgement by EHS or a hired vendor will be considered in interpretation of analytical results from sampling.

Occupational exposure monitoring data shall be compared to state and federal occupational exposure limits (OELs) and permissible exposure limits (PELs). Sources for OELs and PELs can be found at OSHA’s Permissible Exposure Limits – Annotated Tables, Table Z-1, Table Z-2, and Table Z-3. Please note that these tables only include occupational exposure limits (OELs) for substances listed under OSHA. OELs for hundreds of additional substances have been adopted by National Institute for Occupational Safety and Health (NIOSH), and American Conference of Governmental Industrial Hygienists (ACGIH). These

organizations periodically revise their OELs, therefore should be consulted directly about their most current values and substances.

Additionally, the NIOSH Pocket Guide to Chemical Hazards is a guide that is intended as a source of general industrial hygiene information on several hundred chemicals/classes for workers, employers, and occupational health professionals. Please refer to this guide when identifying various chemical hazards.

MEDICAL EVALUATION

The use of a respirator adds resistance to the normal breathing functions of the body, and breathing may become laborious under certain conditions. For example, areas of high humidity, or respirator filters in need of replacement because of the accumulation of airborne dust, mists or vapors, may contribute to the respiratory resistance. For these reasons, regulations require respirator medical evaluation prior to the use of wearing a respirator on the job or to conduct work tasks.

Respirator medical evaluations are a requirement for all UVM Personnel enrolled in this RPP. UVM Personnel who are required to wear respirators to conduct their work must fill out and submit the OSHA Respirator Medical Evaluation Questionnaire every three (3) years or annually for specific positions designated by state and federal regulations. An initial physical medical examination can substitute the questionnaire only if it obtains the same information as the medical questionnaire.

Respirator medical evaluations will be administered confidentially. The University's access to information is limited to the information contained in the designated Physician or Licensed Health Care Professional's (PLHCP) written clearance and recommendation document(s). The University and/or sponsoring department or college will provide respirator medical evaluations at no cost to UVM Personnel enrolled in this RRP. It is the Managers and Supervisors' responsibility to ensure that all UVM Personnel within their assigned unit have received their medical evaluation.

The medical evaluation will be conducted in accordance with the OSHA 1910.134 Appendix C "OSHA Respirator Medical Evaluation Questionnaire".

- If your **primary designation** is as a **UVM Student** and have a MyWellbeing account, please login to your account and see following instructions to fill out and submit an online questionnaire:
    (1) Log on to https://mywellbeing.uvm.edu (smart phone not recommended).
    (2) From the home page, click on "Survey & On-Demand Questionnaires".
    (3) Select "OSHA Respirator Medical Evaluation".
    (4) Complete the OSHA Respirator Screening Questionnaire in full.
    (5) To participate in the Occupational Health and Safety program, select "I ACCEPT" at the bottom of the questionnaire and click the "Send" button to transmit the questionnaire to Student Health Services for review.
    (6) Student Health may have questions about your questionnaire, so it is a good idea to monitor your UVM email for message notifications and check Mywellbeing for new messages.
    (7) It is your responsibility to 1) monitor your UVM email and Mywellbeing accounts for receipt of your medical clearance form and 2) email the form to Occupational Health at ohealth@uvm.edu.

    Should there be questions regarding primary designation, the individual should use the UVM Directory search to determine their proper affiliation.

    Questionnaires for students are reviewed, and written clearance and recommendation document(s) are provided by the Center for Health and Wellbeing. If necessary, follow-up medical exams may

be provided at no cost to the student. If further medical evaluation is required, it can be arranged for students to be referred to UVM's approved contracted vendor(s).

- For **UVM employees**, faculty or staff member, please go to UVM approved contractor vendor Champlain Medical Urgent Care's website to fill out and submit an online questionnaire.

If respiratory protection is needed or requested as part of Voluntary Use, a respirator medical evaluation is required in advance to determine if the employee is physically qualified to use a respirator.

If an individual refuses to be medically evaluated for the use of a respirator, it may affect their roles and position. Those individuals should not be allowed to perform a job or work task that requires a respirator.

Upon request, the Program Administrator(s) can provide a hardcopy or a Portable Document Format (PDF) of the questionnaire (*Appendix D*) to any UVM Personnel. The individual will fill out the questionnaire hardcopy or PDF, sign, and either email to or mail a hardcopy to the designated PLHCP. To submit a questionnaire to a preferred PLHCP outside UVM's approved contracted vendor(s), please contact the Program Administrator(s) prior to submitting a medical questionnaire.

A PLHCP, based on the information obtained from the medical evaluation questionnaire, will make the following determinations:

1. Whether or not the employee is medically able to use a respirator.
2. If there are any limitations on respirator use related to the medical condition of the employee or to the workplace conditions in which the respirator will be used.
3. If there is a need for a follow-up medical examination.

A follow-up medical examination may be required for employees who give a positive response on the OSHA Respirator Medical Evaluation Questionnaire, or if the PLHCP has reason to believe that a condition exists that could affect the UVM Personnel's ability to wear a respirator. Follow-up medical evaluations will be scheduled and recorded, being made available at a time convenient to or during UVM Personnel's normal working hours.

The follow-up medical examination may include any medical tests, consultations, or diagnostic procedures that the PLHCP deems necessary to make a final determination and will consider the physiological and psychological conditions pertinent to the wearing of different types of respirators for an employee. A PLHCP may also investigate a medical condition that is not addressed in the questionnaire if the PLHCP has reason to believe that the condition could affect the employee's ability to wear a respirator. Such evaluations may include medical history, additional medical questionnaire, physical exam, and/or a Pulmonary Function Test (PFT).

PFTs are administered in accordance with state and federal regulation and mandatory for the following UVM Personnel:

- UVM Personnel enrolled in the Asbestos Management Program.
- UVM Personnel in areas as determined by a physician.

The PLHCP may recommend an employee follow up with their personal physician regarding a health condition that does not affect their ability to wear respirator. In these cases, the employee is responsible for any costs incurred during the diagnosis and treatment of a non-work-related health condition.

The PLHCP is available to discuss the results of the questionnaire and/or any follow-up exams with the UVM Personnel or other parties only with written permission.

Specific positions and roles designated by state and federal regulations that require annual medical evaluations be provided are as follows:

- Employees exposed to asbestos or lead above state or federal PEL for more than 30 days during a working year.
- Employees whose work is regulated by a more stringent standard or guideline(s).
- When Employees report medical signs or symptoms related to ability to use respirator.
- PLHCP, Manager or Supervisor, or Program Administrator(s) informs the University of needs of a re-evaluation.
- A change in workplace conditions that may result in substantial increase in physiological burden placed on employee.

FIT TESTING

Fit testing is required before UVM Personnel are permitted to wear a tight-fitting type respirator (both APR's and atmosphere supplying) on the job. Fit testing is not required for loose-fitting Powered Air Purifying Respirators (PAPR). An initial fit test will be conducted, and annually thereafter. Fit tests will be repeated if an employee receives a new or different respirator, structural change to the face, such as after dental or facial surgery, a weight gain or loss greater than 10% and at any time, or as requested by the employee. It is the Supervisor's responsibility to ensure that the UVM Personnel with their assigned unit are fit tested every year or as needed.

Trained EHS staff or a competent person can conduct fit tests for UVM Personnel, such as individual employees, students, or small groups. However, due to lack of space and equipment, EHS is unable to accommodate large groups. In these cases, the sponsoring college or department should arrange fit testing with an outside vendor so that UVM Personnel can be fit tested in a timely manner.

UVM Personnel will be fit tested with the make, model, and size of respirator that they are assigned or will wear on the job. UVM Personnel should bring the assigned respirator to their scheduled appointment, otherwise several make and model sample respirators are available for those who do not yet have one.

The fit test is performed in accordance with OSHA 29 CFR 1910.134 Appendix A. UVM's standard operating procedures (SOP) for fit testing can be found in *Appendix E*.

UVM Personnel should be prepared to bring proof of your medical clearance to the scheduled fit test. Coming to your appointment, an individual CAN NOT have facial hair, jewelry, or cosmetics (excessive sunscreen, moisturizer, makeup, etc.) that impede on a proper fit. An individual getting a fit test should avoid eating fifteen minutes before your scheduled appointment. If an individual is a smoker, that person shall refrain from smoking at least thirty minutes before the fit test.

An appointment for a fit test can be booked and scheduled by going to Respirator Fit Test_bookings. A fit test can take approximately 20-30 minutes. If for some reason UVM Personnel cannot keep a scheduled fit test appointment time, contact ohealth@uvm.edu in advance. A technician is scheduled to conduct a fit test - please be respectful of their time.

There are two categories of fit tests:

A Qualitative Fit Test (QLFT) relies on the individual's response to an OSHA approved test agent. QLFT is used for fit testing negative pressure APRs or PAPRs in negative pressure mode. QLFT are intended to fit test respirators that must achieve fit factor no more than 100.

The qualitative fit-testing methods used:

Irritant Smoke Protocol

Bitrex Protocol
Saccharin Protocol

A Quantitative Fit Test (QNFT) involves a numerical measurement of mask leakage comparing the concentration of an OSHA approved test substance introduced to the ambient air to the concentration inside the respirator when worn. E.g., Condensation nuclei counter.

The quantitative fit-testing instruments used:

TSI Incorporated PortaCount® Pro Model 8038 or Model 8048
TSI Incorporated Particle Generator Model 8026

QNFT are intended to fit test respirators that must achieve fit factor of 100 or greater. A half-mask respirator must yield a fit factor of 100 or greater, and a full facepiece for 500 or greater.

To successfully pass a fit test, UVM Personnel must complete a series of required steps and exercises while standing, without changing or adjusting the respirator, and the respirator cannot slip or move in a manner to become loose. If the selected test agent is detected during the fit test, the test has failed. A second fit test can be attempted, but after two attempts and the UVM Personnel still cannot complete all the steps, it is best to try to fit test a different make and model respirator.

At any point the UVM Personnel becomes uncomfortable, expresses pain or discomfort, has difficulty breathing, the fit test should stop immediately, and the situation shall be evaluated if person should refer to PLHCP or if a different make and model respirator should be selected for fit testing.

The following are the required steps and exercises during a fit test:

1. Correctly don the respirator.
2. Demonstrate a User Seal Check.
3. Acclimate by wearing the respirator for five minutes.
4. Complete exercises 1 through 8, each for 60 seconds.
   1) breathe normally, 2) breathe deeply, 3) turn head side to side, 4) move head up and down slowly, 5) read the OSHA rainbow passage, 6) grimace, 7) bending over, repeatedly (or alternative jog in place), 8) breathe normally.

The fit test is Pass/Fail. Upon a Pass, a Fit Test Record will be provided to the UVM Personnel, and it is their responsibility to forward it to their Supervisor. Sample Fit Test Records can be found in *Appendix F*.

USER SEAL CHECK

UVM Personnel must be able to demonstrate how to correctly don the respirator and perform a user seal check. The purpose of the seal check is to make sure a tight-fitting respirator is properly positioned on the face, fitting along the face, nose-bridge, checks and jawline. The user seal check is required prior to entering a work area with known or potential respiratory hazards and performed each time a respirator is donned to check for face to facepiece leaks.

A User Seal Check should be conducted as indicated in the respirator manufacture's manual. It is critical that each UVM Personnel performs a positive and negative user seal check prior to entering a known or potentially harmful atmosphere. A negative user seal check is conducted by sealing the filter openings and inhaling normally until the facepiece slightly vacuums to the face. A positive user seal check is conducted after sealing the exhalation valves or filter openings and exhaling until a slight bulge is achieved in the facepiece. Air leakage should not be detectable. If leaks are detected, the respirator should be removed and inspected for signs of wear and tear. If none are detected, the seal check should be repeated and the respirator repositioned on the face until a proper fit is achieved. If a proper fit cannot be achieved, a supervisor should

be contacted, and either attempting a user seal check on a new respirator of the same assigned make, model, and size or fit testing a different style respirator may be necessary.

The importance of the user seal check shall be emphasized in the training session and should be reinforced by the UVM Personnel's supervisor. A respirator must be properly worn at all times.

RESPIRATOR SELECTION

If a respirator is required for a specific job task or work area, the affected Department Managers and Supervisors assisted by the Program Administrator will specify the appropriate type of respirator for the respiratory hazard required on the Respiratory Hazard Assessment Form.

Assigned Protection Factors (APF) listed in Table 1 of OSHA 29 CFR 1910.134(d)(3)(i)(A) shall be referenced in the selection of a respirator that meets or exceeds the required level of protection. When using a combination respirator (e.g., airline respirators with an air-purifying filter), employers must ensure that the APF is appropriate to the mode of operation in which the respirator is being used. Additional information on APFs can be found on OSHA's webpage at OSHA Publication | Assigned Protection Factors (PDF).

The department affected will provide respirators, when necessary, which are applicable and suitable for the purpose intended. All respirators provided shall be NIOSH-certified and bear a NIOSH approval number. This includes all replaceable parts, disposable filters, and fit testing equipment. Different brands, models and sizes will be available for the individual to achieve adequate protection and the most comfortable fit. Modifications of respirator equipment are not permitted beyond the manufacturer's intent, instructions, or accessories.

UVM Personnel may not rely on respirators alone to control exposures when feasible engineering controls are available. When engineering controls are not sufficient, or while they are being instituted, appropriate respirators will be used.

Based on the information provided from the respiratory hazard assessment performed by Managers or Supervisors and EHS, the qualified individual(s) will identify and evaluate respiratory hazards and the logic in this section will be used to determine the appropriate type of respirator to be worn. Where a contaminant source is identified and cannot be reasonably estimated, it will be considered IDLH.

UVM uses two classes of respirators:

1. Air-Purifying Respirators (APR) have filters, cartridges, or canisters that remove contaminants from the air before it reaches the user. Particulate filters provide protection from solid or liquid particles found in the air such as dust, dirt, mists, and biological aerosols. Cartridges and canisters provide protection from gases and vapors. Some particulate respirators are disposable and should be discarded after each use. Elastomeric cartridge or canister respirators are reusable, as long as the cartridges or canisters are replaced before they reach the end of their service life. These respirators come in half-facepiece or full facepiece designs. APRs used at UVM include:
    - Filtering facepiece (i.e. N-95)
    - A half or full-face tight fitting negative pressure respirator.
    - A half or full-face tight fitting Powered Air-Purifying Respirator (PAPR)
    - Loose-fitting positive pressure respirator.
    - Loose-Fitting Covering (i.e. hood & helmet)

2. Atmosphere-Supplying Respirators (ASR) supply clean air directly to the user from an uncontaminated source. These are used in Immediately Dangerous to Life and Health (IDLH) environments, such as when the air lacks sufficient oxygen or when the level of contamination is such that an exposure would

be life threatening. These types of respirators include self-contained breathing apparatus (SCBA) and supplied-air respirators (SAR).

Specific job tasks that may require the use of an atmosphere-supplying respirators are only used with prior approval by EHS following a respiratory hazard assessment. ASRs used at UVM that need prior approval include:

- Atmosphere Supplying Respirator
- Classes of Atmosphere Supplying Respirator
- Continuous Flow
- Demand
- Pressure Demand
- Supplied Air Respirator (SAR)
- Self-Contained Breathing Apparatus (SCBA)

Emergency escape respirators, as the name implies, can only be used for one thing – to escape or exit from a room or building in an emergency, usually a large chemical release, leak or spill, or when a supplied air respirator fails or runs out of air. An escape respirator is typically a small bottle or tank of air connected to a facepiece that supplies 5-10 minutes of air. Some supplied air respirators will have an auxiliary bottle of air for escape that connects to the existing facepiece.

A tight-fitting facepiece APR requires a tight seal around the face, nose-bridge, cheeks and jawline. These tight-fitting respirators cannot be used if facial hair (24-hour growth or more), cosmetics, or other components compromise the proper placement, seal, or valve function. If the employee is not receptive to removal of facial hair or if the assigned activity cannot be transferred to another employee, a loose-fitting powered air-purifying respirator (PAPR) must be used, given that the respirator provides adequate protection. Employees may wear corrective lenses or goggles if they do not interfere with the fit of the respirator.

Employees may wear corrective lenses or goggles, but they may not interfere with the seal of the facepiece to the face of the user. The department affected will provide spectacle kits for use with tight-fitting full-facepiece respirators when necessary. Hard contact lenses are not to be worn with any PAPR or SAR. Soft contact lenses with a full face, helmeted or hooded respirator are allowed. Contact lenses may be worn but they are not recommended in dusty environments while wearing a half-facepiece respirator.

The use of disposable filtering facepieces is acceptable in some applications (i.e., animal care, pandemic preparedness etc.). A designated qualified individual from EHS will review the Respirator Request Form for applicability. These types of respirators are not approved in many circumstances.

The OSHA website provides an eTool with instruction on the proper selection of respiratory protection and the development of change schedules for gas/vapor cartridges as well as helps you comply with the OSHA respirator standard. This can be found at eTool : Respiratory Protection | OSHA.gov | Occupational Safety and Health Administration.

FILTER, CARTRIDGE & CANISTER SELECTION

If requiring the use of an APR, the Manager and Supervisor, assisted by the Program Administer, will specify the type of filter, cartridge, or canister that is appropriate for the type of respiratory hazard. Managers and Supervisors shall ensure that all filters, cartridges and canisters used in the workplace are labeled and color coded with the NIOSH approval label and that the label is not removed and remains legible. A respirator cartridge, canister, & filter color coded selection chart is provided in *Appendix H*.

The NIOSH 42 CFR 84 listed three categories of filter categories of resistance to filter efficiency degradation are labeled N (Not resistant to oil), R (Resistant to oil), and P (oil Proof). Each filter category has one of three levels of filter efficiency (95%, 99%, and 99.97%). The three levels of filter efficiency include the Type 100 (99.97% efficient), Type 99 (99% efficient), and the Type 95 (95% efficient). This provides a total of nine respirator filter classes. R- or P-series filters should be selected if there are oil (e.g., lubricants, cutting fluids, glycerine) or non-oil aerosols in the workplace. N-series filters should be used only for non-oil (i.e., solid and water-based) aerosols.

Class of Filter	Filter Efficiency (%)
N-series	-
N for ***N****ot* resistant to oil	-
N100	99.97
N99	99
N95	95
R-series	-
R for ***R****esistant* to oil	-
R100	99.97
R99	99
R95	95
P-series	-
P for oil ***P****roof*	-
R100	99.97
R99	99
R95	95

The service life of all three categories of filters efficiency degradation (i.e., N-, R-, and P-series) is limited by considerations of hygiene, damage, and breathing resistance. All filters should be replaced whenever they are damaged, soiled, or causing noticeably increased breathing resistance (e.g., causing discomfort to the wearer).

Table 1 under NIOSH 42 CFR 84 for Description of Filter Classes Certified can be referenced in the selection of a respirator filter that meets or exceeds the required level of protection. This information can be found at NIOSH Guide to the Selection & Use of Particulate Respirators | NIOSH | CDC.

Although there are nine (9) classes of filters for NIOSH-approved filtering facepiece respirators available at this time, ninety-five percent (95%) is the minimal level of filtration that will be approved by NIOSH. N95 and P100 are the most commonly used.

Canister or cartridge selection is dependent on the filter, sorbent, or catalyst, or combination of these items effectiveness to remove specific identified contaminants and respiratory hazards. Vapor- and gas- removing canisters or cartridges provide no protection against aerosol contaminants. Chemical cartridges and canisters are specific for the gas/vapor they are designed for and can only be selected for those chemicals they are effective against.

Cartridges and canisters have a finite service life. A useful service life is how long it provides adequate protection from harmful chemicals in the air. The service life of a cartridge depends upon many factors, including environmental conditions, breathing rate, cartridge filtering capacity, and the concentration of contaminants in the air. The service life can be, and most often is, different for each chemical contaminant(s) and respiratory hazards. For safe use of respirators using cartridges and canisters, it is imperative to replace them before the downstream concentration (what is coming out of the cartridge) reaches an unacceptable

level, when the cartridge or canister no longer absorbs all the contaminants. This is also referred to as breakthrough.

To avoid breakthrough, the respirator user needs to refer to, as per manufacturers instruction, the built-in End-of-Service Life Indicator (ESLI) present on a canister or cartridge, establishing when it is reaching end of adequate respiratory protection, e.g., the sorbent is approaching saturation or is no longer effective and should be replaced and disposed of properly.

For canisters and cartridges without a built-in ESLI present, the respirator user must follow the established Change Schedule listed in the Site-Specific Respiratory Protection Plan (*Appendix A*). The Change Schedule states the time interval after which a used canister or cartridge should be replaced with a new one, and the objective information or data that was relied upon to make this judgment. An appropriate change schedule ensures the cartridge or canister will be changed before the downstream concentration (what is coming out of the cartridge) reaches an unacceptable level. It is suggested that employers apply a safety factor to the service life estimate to ensure that the Change Schedule is a conservative estimate. Employees should assume worst case conditions to avoid breakthrough earlier than anticipated. Change Schedules shall be established in accordance with ANSI Z88.2 2015.

Additional information can be found at eTool : Respiratory Protection – Respirator Change Schedules | OSHA.gov | Occupational Safety and Health Administration.

RESPIRATOR USE, INSPECTION AND MAINTENANCE

UVM Personnel will be responsible for properly wearing and using in the correct manner and routinely inspecting their assigned respirator for defects, signs of wear, and for replacing deteriorated parts. Additionally, UVM Personnel are responsible for informing their supervisor when a respirator is worn or damaged and needs to be replaced.

The respirator should be stored in a safe, clean manner, in an area free from excessive dust, sunlight, temperature, moisture and chemicals. The storage area should be large enough so as to not disfigure the respirator. Non-disposable respirators assigned to an individual will be cleaned and maintained by the employee to whom it was issued as needed. Shared non-disposable respirators not assigned to a specific individual will be cleaned and maintained after use by the UVM Personnel to whom it was issued.

Managers and Supervisors will periodically monitor and inspect the use of respirators to ensure proper use and care.

I. Respirator Use

UVM Personnel must wear a NIOSH approved respirator when and where it is appropriate, and wear the make, model, and size respirator for which they were fit tested and medically cleared in accordance with the training they have received.

A tight-fitting facepiece respirator is not to be worn if facial hair (24-hour growth or more) compromises the peripheral seal or valve function. If the employee is not receptive to removal of facial hair or if the assigned activity cannot be transferred to another employee, a positive pressure hood or helmet type respirator must be used, given that the respirator provides adequate protection.

Straps should be adjusted for a snug fit, but not to a point it becomes painful to wear. The respirator should be properly fitted on the face, cheeks, nose-bridge, and jawline with room for eye protection when required. If head or skin protection, such as a hardhat or hooded Tyvek©, is required in conjunction with the respirator, the respirator straps should be worn inside the hood of the suit or under the hardhat to avoid premature or accidental respirator removal.

UVM Personnel must perform a user seal check prior to every use and before entering a work area.

Verbal communication should be kept to a minimum while wearing a respirator to avoid breaking the seal of the facepiece.

Always read cartridge and filter labels prior to use. Make certain purifying cartridges are NIOSH approved and provide the required protection for the specific contaminant.

Air purifying respirators MUST NOT BE USED for protection against gas or vapor, which does not have a warning property such as odor, taste, respiratory irritation or increased breathing resistance.

Air purifying respirators MUST ONLY BE USED when the warning properties of a gas or vapor are detectable before the contaminant reaches the VOSHA PEL level.

The UVM Personnel respirator wearer shall be allowed to leave the hazardous atmosphere and work area for any respirator-related cause. Reasons may include, but are not limited to, the following:

1. respirator fails to provide adequate protection
2. respirator malfunction
3. detecting air contaminant leakage into the respirator
4. increased breathing resistance
5. unusual discomfort in wearing the respirator
6. illness of the respirator wearer, including sensation of dizziness; nausea, weakness
7. breathing difficulty, coughing, sneezing, vomiting, fever and chills
8. to wash their face and the respirator facepiece to minimize skin irritation
9. to change the air-purifying elements or other components whenever needed
10. when the respirator reaches the limits of its service life

II. Maintenance

Respirator maintenance and care is chiefly the responsibility of the UVM Personnel to which it is assigned. Respirators are to always be properly maintained to ensure that they function correctly.

Respirators and components will be inspected regularly and prior to daily use by the UVM Personnel and as necessary by the Supervisor. Respirators are subject to prior to use, annual, and periodic inspections. Inspections should be completed as per the manufacturers' recommendations and the UVM Respirator Inspection Checklist (*Appendix G*).

Annual inspection checklists shall be completed by the user or a competent person and submitted to the Department Managers(s) and/or Occupational Health and Safety Office ohso@uvm.edu.

Additionally, inspection checklists shall be completed by a competent person any time there is a hazardous event, near miss, illness, or injury resulting from use of PPE or devices.

If PPE or device is damaged or needs repairs IMMEDIATELY pull out of service, label "Do Not Use", and notify your supervisor.

Before each use, UVM Personnel must perform a visual inspection of the respirator and respirator parts for cleanliness and defects. The respirator should be checked for signs of wear and tear, cuts, cracks, holes, broken or missing pieces, discoloration, embedded material, softening, sticky or hardening, or other signs of damage or causes to indicate the respirator is defective. Defective or damaged parts will be disposed of, repaired, or replaced before use according to manufacturer's specifications.

Disposable respirators that are damaged must be discarded. UVM Personnel using PAPRs must check the airflow, airflow alarms, and battery life in accordance with the manufacturer's instructions before use. Battery packs must be charged and/or replaced in accordance with the manufacturer's instructions.

Respirator replacement parts will be stocked and readily available (i.e. filters, straps, gaskets, valve seals, etc.) in the UVM Personnel department.

UVM Personnel wearing elastomeric APRs or PAPRs with particulate filters should change the filter in accordance with the manufacturer's guidelines, or when they first begin to experience resistance breathing while wearing the respirator. Gas and vapor cartridges need to be replaced in accordance with a change-out schedule that is in accordance with the manufacturer's guidelines. The change-out schedule is based on the hazard assessment for the job task, the UVM Personnel's estimated or actual exposure, the duration of exposure, and environmental factors such as temperature and humidity.

III. Cleaning and Storage

Respirator cleaning is the responsibility of the UVM Personnel to which it is assigned. Reusable respirator facepieces and associated parts must be cleaned and disinfected as often as necessary or at least once a day following the manufacturer's instructions. UVM Personnel must keep track of their respirators and may not share or use someone else's respirator.

Respirators used shall not be laundered at private residences or public facilities. A respirator that becomes contaminated with hazardous materials must be decontaminated prior to being laundered or appropriately discarded. Colleges/Administrative units are responsible for providing suitable laundry services and/or facilities to maintain required PPE.

Respirators will be stored in a clean, dry area free from excessive dust, sunlight, temperatures, moisture, and chemicals when not in use. Cartridges will be stored separately from the respirator in a clean, dry space. The storage area should be large enough to accommodate the respirator without disfigurement. Supervisors will identify proper storage locations.

Disposable filtering facepieces, such as N95s, cannot be disinfected or cleaned. Disposable respirators must be discarded when visibly soiled, physically damaged, when the UVM Personnel experiences resistance breathing through the filter, at the end of the workday, or at the end of service life as specified by the manufacturer. Stricter disposal procedures may be necessary for UVM Personnel wearing N95s for protection from biological agents. These will be documented on the hazard assessment form and communicated to employees by the supervisor.

Reusable respirators should be cleaned with warm water and disinfected daily. The respirator should be dry and stored in a plastic bag. Particulate filters should be changed weekly when used a few hours a day on a daily basis or per site specific change out schedule. Filters should always be changed when breathing resistance is detected. If cartridges are to be re-used, they should be removed from the respirator and stored in a separate plastic bag.

LIMITATIONS & SPECIAL CONSIDERATIONS

All PPE, including respirators, has limitations. This is why PPE is referred to as the last line of defense and why administrative and engineering controls are utilized before determining PPE use. Specific hazards require specific PPE selection. Remember, no one type of PPE and device protects against every hazard.

Limitations to PPE include the following:

1. Restricted movement, dexterity, field of vision, communication, and/or comfort.
2. Misunderstood or misused PPE may provide a false sense of security.
3. PPE that is too large, too small, or otherwise poorly fitted may result in overexposure to a hazard.
4. Improper donning and doffing procedures may expose the user to hazards.
5. PPE must be maintained properly to be effective.

6. When contaminated, the user must stop their work and change PPE.

The operational characteristics, capabilities and performance limitations of the various types of respirators shall be considered during the selection process.

For example: (1) service life – the expected service time of a cartridge or filter, or the amount of breathing air available; (2) worker mobility – limits for hoses may include length, entry and exit points. Bulkiness may limit entry into tight spaces; (3) compatibility with other protective equipment – respirator fit when used with other equipment, e.g. the need for safety glasses, face shield, welding equipment; (4) durability – physical limitations of a specific respirator; (5) comfort factors – respirator fit, weight, breathing resistance and ease of use; and (6) compatibility with the environment – for example if flammable, explosive or corrosive substances are present. (7) compatibility with job and workplace performance – for example use of a firearm with different types of facepieces.

All respirators that have an assigned protection factor (APF) are limited by the maximum use concentration. They must never be used above their maximum use concentrations (MUC).

A low temperature environment may cause fogging of the lens in a respiratory inlet covering and freezing or improper sealing, or both, of the exhalation valve. Coating the inside surface of the lens (i.e. recommended manufacturer's product or saliva) may prevent fogging at low atmospheric temperatures approaching 0 degrees Centigrade (32 degrees Fahrenheit), but severe fogging of the lens may occur at temperatures below -18 degrees Centigrade (0 degrees Fahrenheit). Full facepieces are available with nose cups that direct the warm and moist exhaled air through the exhalation valve without contacting the lens. These facepieces should provide satisfactory vision at temperatures as low as -32 degrees Centigrade (-25 degrees Fahrenheit).

When utilizing a SCBA at very low atmospheric temperatures, the exhalation valve of a respirator may freeze open or closed due to the presence of moisture. Dry respirable air should be used with an air-line respirator and with the type of SCBA that employs a cylinder of air when these devices are used in a low temperature atmosphere. The dew point of this breathing air should be appropriate to the temperature of the atmospheric air. High pressure connections on SCBA may leak because of metal contractions at low atmospheric temperatures. These connections should not be overtightened, since they may break when the apparatus is returned to an atmosphere at normal room temperature. Some air-line type supplied air respirators may be equipped with a device called a vortex tube to warm the air supplied to the respirator inlet covering of the respirator.

Emergency use respirators that are stored in low temperature environments may require special elastomeric components that will retain their elasticity at low temperatures (i.e., regulator diaphragms, gaskets, and breathing tubes). Facepieces stored in low temperature environments can become stiff and distorted to a degree that may prevent an adequate seal of the face to the facepiece. Special care will be used to prevent distortion of facepieces stored at low temperatures. Some SCBA models have cold temperature accessories that may be utilized to help overcome these problems. The manufacturer's instructions will be followed when utilizing these cold temperature accessories.

Wearing a respirator in a high temperature environment applies additional stress on a person. The additional stress, because of wearing a respirator in a high temperature environment, should be minimized by using a respirator having a low weight and offering low resistance to breathing. The air-line type supplied air respirator is recommended for use in a high temperature environment. Air-line type supply air respirators equipped with a vortex tube to cool the air supplied to the respirator inlet covering will substantially reduce the temperature of the air supplied to the respirator.

Elastomeric components of respirators stored in high temperature environments may deteriorate at an accelerated rate and the facepiece may become permanently distorted. Special care will be used to prevent

facepiece distortion. All such respirators will be inspected and maintained at frequency rate that will prevent the use of respirators with deteriorated elastomeric components.

No UVM Personnel should be exposed to Immediately Dangerous to Life and Health (IDLH) atmospheres. A hazard assessment, prior approval and appropriate training is required before UVM Personnel can work in an IDLH atmosphere.

IDLH environments require the highest level of respiratory protection and reliability. Air-purifying respirators shall not be used in IDLH atmospheres. Workers must consider all oxygen deficient atmospheres to be IDLH. If work is deemed necessary in an IDLH atmosphere, UVM, as the employer, must provide either of the following for use in IDLH environments: full-facepiece pressure demand SCBA's that are certified by NIOSH for a minimum service life of 30 minutes, or a combination full-facepiece pressure demand supplied air respirators with auxiliary self-contained air supply.

Compressed gaseous or liquid oxygen for breathing air and oxygen when using SCBAs and SARs will meet the following requirements:

- United States Pharmacopoeia for medical or breathing oxygen.
- U.S. Department of Defense Military Specification MIL- E-83252 or Military Specification MIL-O-15633c.
- And/or at least meet the requirements of the specification for Type C – Grade D breathing air.

Compressed gaseous air may contain low concentrations of oil. If high-pressure oxygen passes through oil or grease- coated orifice, an explosion or fire may occur. Therefore, compressed gaseous oxygen will not be used in supplied air respirators or in open circuit type self-contained breathing apparatus that have previously used compressed air. A compressor will be constructed and situated so as to avoid entry of contaminated air into the air supply system and will be equipped with a suitable in line air purifying sorbent bed and filter to further assure breathing air quality. If an oil lubricated compressor is used, it will be equipped with a high temperature alarm and a carbon monoxide alarm.

HOW TO ENROLL IN THE UVM RESPIRATORY PROGRAM

Everyone who wears a respirator at UVM must be enrolled in the UVM Respiratory Protection Program (RPP). This program is managed by EHS.

Enrollment in the RPP is a multi-step process designed to comply with state and federal regulations. UVM Personnel shall refrain from wearing a respirator during job tasks, academic or research work unless you have completed all of the required steps of the enrollment process.

Notification of Respirator Use Approval will be returned to the UVM Personnel once all requirements have been met as per this RPP. It is the responsibility of the UVM Personnel to forward any notifications to their supervisor.

The required steps can be found and are summarized at Respiratory Protection | Environmental Health and Safety | The University of Vermont. If you have any questions about the RPP please email ohealth@uvm.edu.

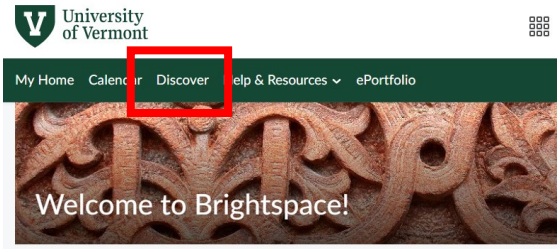
Step 1: A hazard assessment will be performed by qualified individual(s), such as managers and/or supervisors. The Hazard Assessment determines if you need to wear a respirator at all and will include looking at engineering and administrative controls that can be used in the area to eliminate the need for a respirator.

Step 2: Each UVM Student or Employee required or recommended to use a respirator needs to fill out and submit a Request Form. The Program Administrator will review the Respirator Use Request Form and determine if further investigation of the Hazard Assessment is required or recommended. You and a supervisor may be contacted to set up a time to conduct a Hazard Assessment of your work tasks.

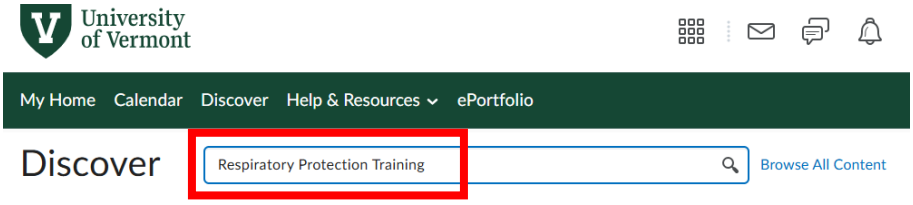
Step 3: Online and/or in-person training is required before you can wear your respirator. You will be trained in the use, care, and maintenance of the type of respirator you have been assigned. Training must be completed every year.

To access the online RPP training please go to Login – UVM Brightspace.

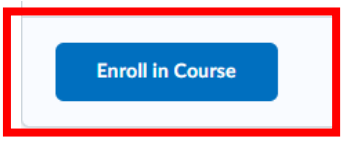
1. Select "Discover"



2. Enter in the search bar "Respiratory Protection Training".



3. The non-credit course should appear for you to select. Enter the course by clicking "Enroll in Course".



This course will go through each required step, including:

1. Training,
2. Obtaining Medical Clearance
3. Submitting Appropriate and Required Forms, ex: Respirator Use Request Form, Hazard Assessment, and
4. How to Schedule a Fit Test.

Step 4: Complete an online OSHA medical questionnaire.

Once you submit the questionnaire, UVM's occupational health care provider will review it and determine if you are medically cleared to wear a respirator. UVM's Occupational

Health Program staff will contact you by email with the medical evaluation results. Medical clearance must be done every 3 years unless otherwise directed by EHS, Program Administrator, or a PLHCP.

Step 5: Schedule a fit test.

Once you have obtained medical clearance and your Respirator Use Request is approved, you must be fit tested to ensure the proper fit and size of your respirator. You can schedule a fit test by going to Respirator Fit Test_bookings, and EHS staff may contact you pertaining to your fit test.

Fit tests must be done annually. Additional fit tests should be scheduled during the year if you have had significant visible changes to your facial structure that could impact fit (dental surgery, significant weight loss/gain) or you are unable to get a good seal during a user seal check.

A fit test can take approximately 30 minutes. If for some reason you cannot keep your scheduled fit test appointment time, contact ohealth@uvm.edu in advance. A technician is scheduled to conduct your fit test – please be respectful of their time.

Stay Up to Date on Program Requirements

The Medical Evaluation Questionnaire must be submitted every three years. Certain employees may require more frequent medical evaluations, such as employees in the Asbestos Management Program, the Lead/Lead Based Paint Program, or employees who are covered by the OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) standard. Fit testing and training are annual requirements and must be completed every year. These program elements are required for all respirator users at UVM – except for personnel who have been approved for voluntary use of disposable N95 respirators under OSHA's voluntary use program.

The Respirator Program Administrator(s) keeps copies of the medical clearance status, fit test results, and training records. For laboratory use of respirators, such records will be maintained in the Lab Safety Notebook. The employee record is available to the respective UVM Personnel, the immediate Supervisor and any individual who has received approval from EHS.

DEFINITIONS

Air-purifying element	a filter, sorbent, catalyst or combination thereof, which removes specific contaminants from the air passing through it.
Air-purifying respirator	means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.
Atmosphere-supplying respirator	means a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.
Canister or cartridge	means a container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.
Continuous flow respirator	means a respirator which provides a continuous flow of breathing air to the respiratory inlet covering.
Demand respirator	means an atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.
Emergency situation	means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.
Employee exposure	means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.
End-of-service-life indicator (ESLI)	means a system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.
Escape-only respirator	means a respirator intended to be used only for emergency exit.
Filter or air purifying element	means a component used in respirators to remove solid or liquid aerosols from the inspired air. Also called air- purifying element.
Filtering facepiece (dust mask)	means a negative pressure tight fitting particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.
Fit factor	means a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.
Fit test	means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. (See also Qualitative fit test QLFT and Quantitative fit test QNFT.)
Helmet	means a rigid respiratory inlet covering that also provides head protection against impact and penetration.
High efficiency particulate air (HEPA) filter	means a filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.
Hood	means a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.
Immediately dangerous to life or health (IDLH)	means an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.

Interior structural firefighting	means the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage. (See 29 CFR 1910.155)
Loose-fitting facepiece	means a positive pressure respirator that is designed to form a partial seal with the face.
Negative pressure respirator (tight fitting)	means a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.
Oxygen deficient atmosphere	means an atmosphere with an oxygen content below 19.5% by volume.
Physician or other licensed health care professional (PLHCP)	means an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required by paragraph I of this section.
Positive pressure respirator	means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.
Powered air-purifying respirator (PAPR)	means a positive pressure air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.
Pressure demand respirator	means a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.
Qualitative fit test (QLFT)	means a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.
Quantitative fit test (QNFT)	means an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.
Respiratory inlet covering	means that portion of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a facepiece, helmet, hood, suit, or a mouthpiece respirator with nose clamp.
Self-contained breathing apparatus (SCBA)	means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.
Service life	means the period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer.
Supplied-air respirator (SAR) or airline respirator	means an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.
Tight-fitting facepiece	means a respiratory inlet covering that forms a complete seal with the face.
User seal check	means an action conducted by the respirator user to determine if the respirator is properly seated to the face by conducting positive and negative pressure checks.

University of Vermont

APPENDIX A

Site-Specific Respiratory Protection Plan

University of Vermont

Department of Environmental Health & Safety
Occupational Health & Safety Office

321 Ryan Street,
Essex, Vermont 05452

Site-Specific Respiratory Protection Plan

Identifying Respiratory Hazards

In accordance with OSHA regulations and industry best work practices, any time UVM Personnel (employees (faculty/staff), students, and visitors, including contractors and consultants) may be exposed by inhaling dangerous substances, chemicals or infectious particles, a respiratory hazard exists.

When a hazard can be eliminated, it is the employer's obligation to do so either by changing procedures, redesigning the work environment, or using passive fall protection (e.g., guardrails, handrails, etc.). When this is not possible, use of respiratory protection devices may be required.

This Respiratory Protection Plan applies to all UVM Personnel assigned or working in the Department/College/Unit listed below who are required to wear a respirator during normal assigned job tasks, work operations, courses of study in a classroom, research in a laboratory, or workshop, and during some non-routine or emergency operations. This Respiratory Protection Plan is intended to ensure that all UVM Personnel who use respirators have had their health evaluated and the results documented.

Applicable VOSHA Regulation:

OSHA 29 CFR 1910.134 Respiratory Protection
NIOSH 42 CFR 84 Approval of Respiratory Protective Devices
ANSI Z88.2 2015 The American National Standard Practices for Respiratory Protection

Department/College/Unit		
Building/Location(s)		
Respiratory Protection Plan Supervisor		
Print Name	Email	Phone

The Supervisor's duties are to oversee the development of this respiratory protection plan and make sure it is carried out at the workplace. The Supervisor will also evaluate the program regularly to make sure procedures are followed, respirator use is monitored, and respirators continue to provide adequate protection when job conditions change.

For EHS Use Only	
Reference No.:	Date Approved:

The Department/College/Unit of _____

has evaluated the use of or working around dangerous substances, chemicals, and infectious particles at this facility and found respirators must be used by UVM Personnel in the following locations or positions or doing the following duties, tasks or activities:

List of Building(s)/Location(s)/Room Number(s) *(please list and describe specific areas respirator use is required)*

Job Position Title/Activity	**Chemicals, Products Used, Identified Hazard**	**Frequency of Use** *(routinely, rarely, or emergency use)*

Copies of or access to Safety Data Sheet(s) (SDS) are required. SDS links or locations, where to find SDS are listed below or attached.

Safety Data Sheets (SDS)

Selection of Respirators

The following respirators were selected and available:

Manufacturer/Make	Model	Sizes

Selection of Filter/Canister/Cartridge

The following Filter/Canister/Cartridge were selected and available:

Manufacturer/Make	Model	Replacement Schedule

These respirators were selected based on the information attached.

Provide Initial Assessment Information, Historical Data or Objective Data, and other information.
[o*ptional: attach air sampling results that show where respirators are required*]

Storage

Respirators (Disposable and Non-disposable), filters, canisters, and cartridges will be stored in the following clean location(s):

Building/Location/Room Number

It is the responsibility of the respirator user that assigned non-disposable respirators be stored in a clean, dry area free from excessive dust, sunlight, temperatures, moisture, and chemicals when not in use. Cartridges will be stored separately from the respirator in a clean, dry space. The storage area should be large enough to accommodate the respirator without disfiguring it.

Recordkeeping

The following records will be kept:

A copy of this completed Respirator Protection Plan
Employees' latest fit-testing results
Employee training records
Written recommendations from our medical provider

The records will be kept at the following location(s):

University of Vermont

APPENDIX B

Respiratory Hazard Assessment Form

University of Vermont

Department of Environmental Health & Safety
Occupational Health & Safety Office

321 Ryan Street,
Essex, Vermont 05452

Respiratory Hazard Assessment Form

Instructions to UVM Supervisors/Managers:

Prior to the selection of respiratory protection, a Hazard Assessment must be completed and UVM Personnel must be aware of the potential respiratory hazards within a work area. The hazard assessment may be conducted of a single individual, a single task, or a group of individuals if all are performing an identical task. Please complete the following form and submit to ohealth@uvm.edu.

Activity and Processes *Please describe the type of work, name, title, or activity involved*		
Assessment Type		
☐ Initial Assessment	☐ 3 Year Review	☐ Revision

Name of Department/College/Unit
Chartfield Value/Dept. Code or other reference number of Department/College/Unit

Work Area Location (*Building, Room Number, Address, etc.*)		
Room Function or Type of Work Area		
☐ Laboratory	☐ Greenhouse	☐ Confined Space
☐ Indoors, temperature controls	☐ Mechanical Space	☐ Outdoors
☐ Indoors, no temperature controls (no A/C or Heat)	☐ Workshop (wood shop, metal shop, paint shop)	☐ Other (*specify*):
Type of Work Activity		
☐ Research and Academic	☐ Facilities Management	☐ Welding, Brazing, Soldering
☐ Animal Care Management/ Services	☐ Healthcare	☐ Confined Space Entry
☐ Emergency Response Services	☐ Chemical Spill Response	☐ Other (*specify*):

Level of Exertion		
☐ Light (ex: standing)	☐ Heavy (ex: lifting >50lbs, construction work, digging)	☐ Varies
☐ Moderate (ex: light lifting and walking)	☐ Strenuous	☐ Other (*specify*):

Other Personal Protective Equipment (PPE) Used		
☐ Head Protection (hard hat, bump cap, hair net)	☐ Hearing Protection	☐ Skin or Body Protection (lab coat, Tyvek suite)
☐ Eye Protection (safety glass, goggles)	☐ Hand Protection	☐ Other (*specify*):

Please provide specific details and/or describe any other work activities or requirements not listed above.

Oxygen Deficient Atmosphere?
If "Yes", additional evaluation will be required. EHS or other Safety Staff may contact you to schedule a workplace evaluation.

☐ Yes

☐ No

Immediately Dangerous to Life or Health Atmosphere?
If "Yes", additional evaluation will be required. EHS or other Safety Staff may contact you to schedule a workplace evaluation.

☐ Yes

☐ No

Identified or Potential Respiratory Hazards			
☐ Chemical	☐ Nuisance Dust	☐ Biological Agents	☐ Radiological Agents
☐ Gas	☐ Smoke	☐ Acids	☐ Infectious aerosols/ droplets/particles
☐ Organic Vapor	☐ Fumes	☐ Bases	☐ Cleaning Infectious/ Contaminated Area
☐ Organic Material	☐ Mist	☐ Asbestos	☐ Chemical/Biological Hazard Clean-up
☐ Aerosol Generating Procedure	☐ Spray	☐ Lead	☐ Confined Space Entry
☐ Particulates	☐ Mold or Fungi	☐ Heavy Metals	☐ In case of Escape/ Emergency Evacuation
☐ Hazardous Material	☐ Pesticides	☐ Silica	☐ Other (*specify*):

☐ Need to block or filter users' airborne droplets from others or tasks

Extreme Temperature			
☐ None	☐ Extreme Heat	☐ Low Temperature	☐ Varies

High Humidity		
☐ Yes	☐ No	☐ Varies

Controls in place:			
☐ Elimination	☐ Substitution	☐ Engineering	☐ Administrative
☐ Personal Protective Equipment (PPE) – *PPE should be used as the last line of defense to respiratory hazards*			
Types Engineering and Administrative Controls in Place			
☐ Isolation	☐ Enclosure	☐ Dilution	☐ Job Rotation
☐ Local Exhaust	☐ Chemical Fume Hood	☐ Ventilation	☐ Job Training
☐ Special Ventilation System	☐ Best Industry Work Practice Standards	☐ Shielding	☐ Other (*specify*):
Please provide specific details or describe any other work conditions not listed above.			

Exposure Assessment
☐ Use of Objective Data – this is the use of data obtained from industry studies, trade associations, or from tests conducted by chemical manufacturers.
☐ Historical Data – this is the use of data obtained from minimum of: utilize sampling methods appropriate for contaminants(s), sampling presenting the worst-case exposures, and represent enough shifts and operations to determine the range of exposure.
☐ Initial Assessment – this is the use of data obtained from initial sampling utilizing methods appropriate for contaminants(s) collection for personal exposure monitoring.
☐ Request an Initial Assessment – no data available.
Occupational Exposure Limit(s) (OEL) List any OSHA Permissible Exposure Limits (PEL) or NIOSH Recommended Exposure Limits (REL) for each contaminant and respiratory hazards.
Hazard Ratio Provide the Hazard Ratio (HR) per contaminant and respiratory hazard here to determine the appropriate Assigned Protection Factor in order to select the appropriate type of respirator. Divide the concentration of an air contaminant by the occupational exposure limit (OEL). (HR = air contaminant concentration / OEL)
Maximum Use Concentration (MUC) Provide the maximum atmospheric concentration (MUC) of a hazardous substance from which an employee can be expected to be protected when wearing a respirator. The MUC is the upper limit at which the class of respirator is expected to provide protection. It is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. Multiply the assigned protection factor (APF) specified for a respirator by the permissible exposure limit (PEL). (APF x PEL = MUC)

Type of Respirator Use
☐ **Required Use** ☐ **Voluntary Use** For Voluntary Use, provide OHSA 29 CFR 1910.134 Appendix D ("Information for Employees Using Respirators When Not Required Under the Standard")? ☐ YES ☐ NO

Minimum Assigned Protection Factor (APF)	Respirator Selection
☐ 5	☐ Quarter Mask Air Purifying Respirator (APR)
☐ 10	☐ Disposable Filtering Facepiece (N95, Dust Mask) ☐ Elastomeric Half Face Air Purifying Respirator (APR) ☐ Half Face Supplied-Air Respirator (SAR) in demand mode[1] ☐ Half Face Self-Containing Breathing Apparatus (SCBA) in demand mode[1]
☐ 25	☐ Loose Fitting Powered Air Purifying Respirator (PAPR) ☐ Helmet or Hood Powered Air Purifying Respirator (PAPR) ☐ Helmet or Hood Supplied-Air Respirator (SAR) in continuous flow mode[1] ☐ Loose Fitting Supplied-Air Respirator (SAR) in continuous flow mode[1]
☐ 50	☐ Elastomeric Full Face Air Purifying Respirator (APR) ☐ Elastomeric Half Face Powered Air Purifying Respirator (PAPR) ☐ Full Face Supplied-Air Respirator (SAR) in demand mode[1] ☐ Half Face Supplied-Air Respirator (SAR) in continuous flow, pressure-demand, or other positive-pressure mode[1] ☐ Full Face Self-Containing Breathing Apparatus (SCBA) in demand mode[1] ☐ Helmet or Hood Self-Containing Breathing Apparatus (SCBA) in demand mode[1]
☐ 1,000	☐ Elastomeric Full Face Powered Air Purifying Respirator (PAPR)* ☐ Helmet or Hood Powered Air Purifying Respirator (PAPR)** ☐ Full Face Supplied-Air Respirator (SAR) in continuous flow, pressure-demand, or other positive-pressure mode[1]
☐ 10,000	☐ Full Face Self-Containing Breathing Apparatus (SCBA) in positive pressure or other pressure demand mode[1] ☐ Helmet or Hood Self-Containing Breathing Apparatus (SCBA) in positive pressure or other pressure demand mode[1]

[1] *If selected, additional evaluation will be required. EHS or other Safety Staff may contact you to schedule a workplace evaluation.*

* must be fit tested utilizing quantitative protocol, otherwise must be treated as a full face APR with a APF of 50.

** must have evidence provided by the respirator manufacturer that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater to receive an APF of 1,000. Absent such testing, all other PAPRs and SARs with helmets/hoods are to be treated as loose-fitting facepiece respirators, and receive an APF of 25.

Filter, Cartridge or Canister Type *Select all filters, cartridge or canister, or combination required*		
☐ Particulate Filter	☐ Formaldehyde	☐ Multi Gas/Vapor
☐ Acid Gas	☐ Hydrogen Fluoride	☐ Organic Vapor
☐ Ammonia/Methylamine	☐ Mercury Vapor	☐ Ozone
☐ Other (*specify*):		

Particulate Filter Type		
☐ N95	☐ N99	☐ N100 High Efficiency Particulate Air (HEPA)
☐ R95	☐ R99	☐ R100 High Efficiency Particulate Air (HEPA)
☐ P95	☐ P99	☐ P100 High Efficiency Particulate Air (HEPA)

Selection of N-, R-, and P-series filters,
N for Not resistant to oil,
R for Resistant to oil
P for oil Proof
Selection of filter efficiency (i.e., 95%, 99%, or 99.97%) depends on how much filter leakage can be accepted.

Change Out Schedule for Filter, Cartridge, Canister
☐ Dispose after each use (*e.g., infectious agents*)
☐ When it becomes harder to breathe or sooner if cartridge becomes wet or damaged (*for particulate filters only*)
☐ 8 hours total from the time the cartridges are opened and unsealed
☐ Whichever comes first: (1) When it becomes harder to breathe, (2) Cartridge becomes wet or damaged, (3) 8 hours from the time the cartridges are opened
☐ 3 hours (*e.g., formaldehyde, certain acid gases*)
☐ Other (*specify*):

Additional Comments or Requirements Not Listed Above

For EHS Use Only	
Reference No.:	Date Approved:

University of Vermont

APPENDIX C

Respirator Use Request Form

University of Vermont

Department of Environmental Health & Safety
Occupational Health & Safety Office

321 Ryan Street,
Essex, Vermont 05452

Respirator Use Request Form

Instructions to UVM Students and Employees:

Please complete the following form to receive approval to wear a respirator at work. Please submit the completed form to ohealth@uvm.edu.

Employee/Student Information		
Last Name	First Name	Middle Initial (*optional*)
UVM NETID	Email	Phone (*optional*)
Job Title		
Department/College		
Work/Office Location (Building Name, Room No., Address)		
Supervisor Information		
Last Name	First Name	Middle Initial (*optional*)
Email	Phone (*optional*)	
Request Type		
☐ Initial Request	☐ Revision	☐ 3 Year Renewal
Type of Respirator Use		
☐ **Required Use**		
☐ **Voluntary Use** For Voluntary Use, have you been provided OHSA 29 CFR 1910.134 Appendix D ("Information for Employees Using Respirators When Not Required Under the Standard")? ☐ YES ☐ NO		
Have you been assigned a respirator at UVM? ☐ YES ☐ NO		
If Yes, What type of respirator?		
☐ Disposable Filtering Facepiece (N95, dust mask)	☐ Loose Fitting or Hood Powered Air Purifying Respirator (PAPR)	☐ Full Face SCBA in demand mode

☐ Elastomeric Half Face Air Purifying Respirator (APR)	☐ Elastomeric Half Face Powered Air Purifying Respirator (PAPR)	☐ Full Face SCBA in positive pressure mode
☐ Elastomeric Full Face Air Purifying Respirator (APR)	☐ Elastomeric Full Face Powered Air Purifying Respirator (PAPR)	☐ Other (*specify*):

If Yes, what size, make and model respirator(s)?

Work Activities

Please check all that apply to your work at UVM

Type of Work Activity

☐ Research and Academic	☐ Facilities Management	☐ Other (*specify*):
☐ Animal Care Management/ Services	☐ Healthcare	
☐ Emergency Response Services	☐ Chemical Spill Response	
☐ Confined Space Entry	☐ Welding, Brazing, Soldering	

Location or Type of Work Area

☐ Laboratory	☐ Greenhouse	☐ Outdoors
☐ Indoors, temperature controls	☐ Mechanical Space	☐ Other (*specify*):
☐ Indoors, no temperature controls (no A/C or Heat)	☐ Workshop (wood shop, metal shop, paint shop)	

Frequency of Use

☐ Rarely (less than 30 days/year)	☐ Monthly	☐ Other (*specify*):
☐ Daily	☐ Yearly	
☐ Weekly	☐ Varies	

Duration of Shift

☐ 0 – 30 minutes	☐ 1 – 2 hours	☐ Varies
☐ 30 – 60 minutes	☐ > 2 hours	☐ Other (*specify*):

Level of Exertion

☐ Light (ex: standing)	☐ Heavy (ex: lifting >50lbs, construction work, digging)	☐ Varies
☐ Moderate (ex: light lifting and walking)	☐ Strenuous	☐ Other (*specify*):

Other Personal Protective Equipment (PPE) Used

☐ Head Protection (hard hat, bump cap, hair net)	☐ Hearing Protection	☐ Skin or Body Protection (lab coat, Tyvek suite)
☐ Eye Protection (safety glass, goggles)	☐ Hand Protection	☐ Other (*specify*):

Work Conditions

Please select the choices below that describe the work area conditions while needing to wear a respirator.

Form of Contaminants

☐ Biological Agents	☐ Fumes	☐ Lead
☐ Radiological Agents	☐ Mist	☐ Heavy Metals
☐ Nuisance Dust	☐ Spray	☐ Mold or Fungi
☐ Organics	☐ Aerosol	☐ Pesticides
☐ Vapor	☐ Acids	☐ Silica
☐ Smoke	☐ Bases	☐ Other (*specify*):
☐ Gas	☐ Asbestos	

Extreme Temperature

☐ Extreme Heat	☐ Varies	☐ Other (*specify*):
☐ Low Temperature	☐ None	

High Humidity

☐ Yes

☐ No

☐ Varies

Are engineering and administrative controls in place?

☐ Yes	☐ No	☐ I do not know

If Yes, the Controls in place:

☐ Elimination	☐ Engineering	☐ Personal Protective Equipment
☐ Substitution	☐ Administrative	☐ Other (*specify*):

Please describe any other work conditions not listed above.

Do you have any questions or concerns about the use of a respirator?

☐ Yes ☐ No

Please enter your questions here or describe your concerns or select ☐ Please Contact Me.

University of Vermont

APPENDIX D

OSHA Respirator Medical Evaluation Questionnaire

Respiratory Protection Program
OSHA Respirator Medical Evaluation Questionnaire (Mandatory)

UVM employees who are required to wear a respirator must complete this form and be medically cleared by the University's designated Physician or Licensed Health Care Professionals (PLHCP) initially before wearing a respirator, and every three years thereafter (unless certain conditions are met as specified in the UVM Respiratory Protection Program). The completed form will be maintained in accordance with the Health Insurance Portability and Accountability Act (HIPPA), which in this case means that only designated PLHCP and clinic staff that require this information to support the employee's health and safety will be the only people who have access to these records. Employees found to have risk factors that require further medical evaluation will be contacted by the designated PLHCP to schedule an appointment.

Submission Instructions:

If your primary designation is a student and have a MyWellbeing Account, questionnaires shall be completed and sent to UVM Center for Health and Wellbeing, Student Health Services.

Option 1 – Go to MyWellbeing Account Login
Under the Home menu enter "messages". Select the "new message" tab to find "I want to submit an OSHA Respiratory Screening"

Option 2 – Scan the completed this questionnaire into portable document format (PDF) and send using UVM's File Transfer system to Student Health Services.

Option 3 – Completed this questionnaire and arrange through Student Health Services to mail a hardcopy.

If you are a UVM Employee (Staff and Faculty Members Only).

Option 1 – Go to the University's designated Physician or Licensed Health Care Professionals (PLHCP) website to submit an online questionnaire.

Option 2 – Scan this completed questionnaire into portable document format (PDF) and email to University's designated Physician or Licensed Health Care Professionals (PLHCP).

Option 2 – Mail a hardcopy to University's designated Physician or Licensed Health Care Professionals (PLHCP).

You must sign the next page to consent or decline the review of your questionnaire by the designated Physician or Licensed Health Care Professionals (PLHCP).

Respiratory Protection Program
OSHA Respirator Medical Evaluation
General Consent for Review and Release of Medical Information

UVM Personnel Information		
Last Name	First Name	Middle Initial (*optional*)
UVM NETID	Email	Phone (*optional*)
Job Title		
Department/College		
Work/Office Location (Building Name, Room No., Address)		
Supervisor Information		
Last Name	First Name	Middle Initial (*optional*)
Email	Phone (*optional*)	

I certify that the statements herein are true, complete, and correct to the best of my knowledge and belief.

I consent that University of Vermont's designated Physician or Licensed Health Care Professionals (PLHCP) may review this information provided. I understand that this review is undertaken for my safety in the job environment and understand that I may be further contacted by a medical provider either for clarifications or further evaluation. Further evaluation may include, but is not limited to, a physical examination, blood tests, an evaluation of lung function, and other diagnostic tests as necessary. Costs for evaluation and testing will be covered by the UVM Occupational Health Program or affected Department/College/Unit.

I further understand that the determination of whether I can safely wear a respirator will be based on the information gathered and this determination as it relates to my job and the performance of essential job functions will be released to me, my supervisor and the Respiratory Protection Program Coordinator.

Signature Date

OR

I decline the review of this information and I understand that if I decline participation in the Respiratory Protection Program, my employment status might change to meet acceptable safety and wellbeing standards.

Signature Date

University of Vermont

Respiratory Protection Program
OSHA Respirator Medical Evaluation Questionnaire

To the employer: Answers to questions in Section 1, and to question 9 in Section 2 of Part A, do not require a medical examination.

To the employee: Can you read English (check one): ☐ Yes ☐ No

Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient for you. To maintain your confidentiality, your employer or supervisor must not look at or review your answers, and your employer must tell you how to deliver or send this questionnaire to the health care professional who will review it.

Part A. Section 1. (Mandatory)

The following information must be provided by every employee who has been selected to use any type of respirator (please print).

1. Today's date: _____
2. Your name: _____
3. Your age (to nearest year): _____
4. Sex (check one): ☐ Female ☐ Male ☐ Non-Binary ☐ Other ☐ Prefer Not to Answer
5. Your height: _____ ft. _____ in.
6. Your weight: _____ lbs.
7. Your job title: _____
8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include the Area Code): _____
9. The best time to phone you at this number: _____
10. Has your employer told you how to contact the health care professional who will review this questionnaire (circle one): Yes/No
11. Check the type of respirator you will use (you can check more than one category):
    a. _____ N, R, or P disposable respirator (filter-mask, non-cartridge type only).
    b. _____ Other type (for example, half- or full-facepiece type, powered-air purifying, supplied-air, self-contained breathing apparatus).
12. Have you worn a respirator (check one): ☐ Yes ☐ No

If "yes," what type(s):

_____

_____

_____

Part A. Section 2. (Mandatory)

Questions 1 through 9 below must be answered by every employee who has been selected to use any type of respirator (please check "yes" or "no").

1. Do you *currently* smoke tobacco, or have you smoked tobacco in the last month: ☐Yes ☐No

2. Have you *ever had* any of the following conditions?
   - a. Seizures: ☐Yes ☐No
   - b. Diabetes (sugar disease): ☐Yes ☐No
   - c. Allergic reactions that interfere with your breathing: ☐Yes ☐No
   - d. Claustrophobia (fear of closed-in places): ☐Yes ☐No
   - e. Trouble smelling odors: ☐Yes ☐No

3. Have you *ever had* any of the following pulmonary or lung problems?
   - a. Asbestosis: ☐Yes ☐No
   - b. Asthma: ☐Yes ☐No
   - c. Chronic bronchitis: ☐Yes ☐No
   - d. Emphysema: ☐Yes ☐No
   - e. Pneumonia: ☐Yes ☐No
   - f. Tuberculosis: ☐Yes ☐No
   - g. Silicosis: ☐Yes ☐No
   - h. Pneumothorax (collapsed lung): ☐Yes ☐No
   - i. Lung cancer: ☐Yes ☐No
   - j. Broken ribs: ☐Yes ☐No
   - k. Any chest injuries or surgeries: ☐Yes ☐No
   - l. Any other lung problem that you've been told about: ☐Yes ☐No

4. Do you *currently* have any of the following symptoms of pulmonary or lung illness?
   - a. Shortness of breath: ☐Yes ☐No
   - b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: ☐Yes ☐No
   - c. Shortness of breath when walking with other people at an ordinary pace on level ground: ☐Yes ☐No
   - d. Have to stop for breath when walking at your own pace on level ground: ☐Yes ☐No
   - e. Shortness of breath when washing or dressing yourself: ☐Yes ☐No
   - f. Shortness of breath that interferes with your job: ☐Yes ☐No
   - g. Coughing that produces phlegm (thick sputum): ☐Yes ☐No
   - h. Coughing that wakes you early in the morning: ☐Yes ☐No

i. Coughing that occurs mostly when you are lying down: ☐Yes ☐No

j. Coughing up blood in the last month: ☐Yes ☐No

k. Wheezing: ☐Yes ☐No

l. Wheezing that interferes with your job: ☐Yes ☐No

m. Chest pain when you breathe deeply: ☐Yes ☐No

n. Any other symptoms that you think may be related to lung problems: ☐Yes ☐No

5. Have you *ever had* any of the following cardiovascular or heart problems?

a. Heart attack: ☐Yes ☐No

b. Stroke: ☐Yes ☐No

c. Angina: ☐Yes ☐No

d. Heart failure: ☐Yes ☐No

e. Swelling in your legs or feet (not caused by walking): ☐Yes ☐No

f. Heart arrhythmia (heart beating irregularly): ☐Yes ☐No

g. High blood pressure: ☐Yes ☐No

h. Any other heart problem that you've been told about: ☐Yes ☐No

6. Have you *ever had* any of the following cardiovascular or heart symptoms?

a. Frequent pain or tightness in your chest: ☐Yes ☐No

b. Pain or tightness in your chest during physical activity: ☐Yes ☐No

c. Pain or tightness in your chest that interferes with your job: o ☐Yes ☐No

d. In the past two years, have you noticed your heart skipping or missing a beat: ☐Yes ☐No

e. Heartburn or indigestion that is not related to eating: ☐Yes ☐No

f. Any other symptoms that you think may be related to heart or circulation problems: ☐Yes ☐No

7. Do you *currently* take medication for any of the following problems?

a. Breathing or lung problems: ☐Yes ☐No

b. Heart trouble: ☐Yes ☐No

c. Blood pressure: ☐Yes ☐No

d. Seizures: ☐Yes ☐No

8. If you've used a respirator, have you *ever had* any of the following problems?
(If you've never used a respirator, check the following space ☐ and go to question 9

a. Eye irritation: ☐Yes ☐No

b. Skin allergies or rashes: ☐Yes ☐No

c. Anxiety: ☐Yes ☐No

d. General weakness or fatigue: ☐Yes ☐No

e. Any other problem that interferes with your use of a respirator: ☐Yes ☐No

9. Would you like to talk to the health care professional who will review this questionnaire about your answers to this questionnaire: ☐Yes ☐No

Questions 10 to 15 below must be answered by every employee who has been selected to use either a full facepiece respirator or a self-contained breathing apparatus (SCBA). For employees who have been selected to use other types of respirators, answering these questions is voluntary.

10. Have you *ever lost* vision in either eye (temporarily or permanently): ☐Yes ☐No

11. Do you *currently* have any of the following vision problems?

a. Wear contact lenses: ☐Yes ☐No

b. Wear glasses: ☐Yes ☐No

c. Color blind: ☐Yes ☐No

d. Any other eye or vision problem: ☐Yes ☐No

12. Have you *ever had* an injury to your ears, including a broken ear drum: ☐Yes ☐No

13. Do you *currently* have any of the following hearing problems?

a. Difficulty hearing: ☐Yes ☐No

b. Wear a hearing aid: ☐Yes ☐No

c. Any other hearing or ear problem: ☐Yes ☐No

14. Have you *ever had* a back injury: ☐Yes ☐No

15. Do you *currently* have any of the following musculoskeletal problems?

a. Weakness in any of your arms, hands, legs, or feet: ☐Yes ☐No

b. Back pain: ☐Yes ☐No

c. Difficulty fully moving your arms and legs: ☐Yes ☐No

d. Pain or stiffness when you lean forward or backward at the waist: ☐Yes ☐No

e. Difficulty fully moving your head up or down: ☐Yes ☐No

f. Difficulty fully moving your head side to side: ☐Yes ☐No

g. Difficulty bending at your knees: ☐Yes ☐No

h. Difficulty squatting to the ground: ☐Yes ☐No

i. Climbing a flight of stairs or a ladder carrying more than 25 lbs: ☐Yes ☐No

j. Any other muscle or skeletal problem that interferes with using a respirator: ☐Yes ☐No

Part B

Any of the following questions, and other questions not listed, may be added to the questionnaire at the discretion of the health care professional who will review the questionnaire.

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen: ☐Yes ☐No

   If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you're working under these conditions: ☐Yes ☐No

2. At work or at home, have you ever been exposed to hazardous solvents, hazardous airborne chemicals (e.g., gases, fumes, or dust), or have you come into skin contact with hazardous chemicals: ☐Yes ☐No

If "yes," name the chemicals if you know them:

_____

_____

_____

3. Have you ever worked with any of the materials, or under any of the conditions, listed below:

   a. Asbestos: ☐Yes ☐No

   b. Silica (*e.g.*, in sandblasting): ☐Yes ☐No

   c. Tungsten/cobalt (*e.g.*, grinding or welding this material): ☐Yes ☐No

   d. Beryllium: ☐Yes ☐No

   e. Aluminum: ☐Yes ☐No

   f. Coal (for example, mining): ☐Yes ☐No

   g. Iron: ☐Yes ☐No

   h. Tin: ☐Yes ☐No

   i. Dusty environments: ☐Yes ☐No

   j. Any other hazardous exposures: ☐Yes ☐No

   If "yes," describe these exposures:

   _____

   _____

   _____

   List any second jobs or side businesses you have:

   _____

   _____

List your previous occupations:

_____

_____

_____

List your current and previous hobbies:

_____

_____

_____

7. Have you been in the military services? Yes/No ☐Yes ☐No
   If "yes," were you exposed to biological or chemical agents
   (either in training or combat): ☐Yes ☐No
8. Have you ever worked on a HAZMAT team? ☐Yes ☐No
9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications): ☐Yes ☐No

   If "yes," name the medications if you know them:

   _____

   _____

   _____

10. Will you be using any of the following items with your respirator(s)?
    a. HEPA Filters: ☐Yes ☐No
    b. Canisters (for example, gas masks): ☐Yes ☐No
    c. Cartridges: ☐Yes ☐No
11. How often are you expected to use the respirator(s) (check "yes" or "no" for all answers that apply to you)?:
    a. Escape only (no rescue): Yes/No ☐Yes ☐No
    b. Emergency rescue only: Yes/No ☐Yes ☐No
    c. Less than 5 hours *per week:* Yes/No ☐Yes ☐No
    d. Less than 2 hours *per day:* Yes/No ☐Yes ☐No
    e. 2 to 4 hours per day: Yes/No ☐Yes ☐No
    f. Over 4 hours per day: Yes/No ☐Yes ☐No

12. During the period you are using the respirator(s), is your work effort:

a. *Light* (less than 200 kcal per hour): ☐Yes ☐No

If "yes," how long does this period last during the average shift: _____hrs._____mins.

Examples of a light work effort are *sitting* while writing, typing, drafting, or performing light assembly work; or *standing* while operating a drill press (1-3 lbs.) or controlling machines.

b. *Moderate* (200 to 350 kcal per hour): ☐Yes ☐No

If "yes," how long does this period last during the average shift: _____hrs._____mins.

Examples of moderate work effort are *sitting* while nailing or filing; *driving* a truck or bus in urban traffic; *standing* while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; *walking* on a level surface about 2 mph or down a 5-degree grade about 3 mph; or *pushing* a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

c. *Heavy* (above 350 kcal per hour): ☐Yes ☐No

If "yes," how long does this period last during the average shift: _____hrs._____mins.

Examples of heavy work are *lifting* a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; *shoveling; standing* while bricklaying or chipping castings; *walking* up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you're using your respirator: ☐Yes ☐No

If "yes," describe this protective clothing and/or equipment:

_____

_____

_____

14. Will you be working under hot conditions (temperature exceeding 77 °F): ☐Yes ☐No

15. Will you be working under humid conditions: ☐Yes ☐No

16. Describe the work you'll be doing while you're using your respirator(s):

_____

_____

_____

17. Describe any special or hazardous conditions you might encounter when you're using your respirator(s) (for example, confined spaces, life-threatening gases):

_____

_____

_____

18. Provide the following information, if you know it, for each toxic substance that you'll be exposed to when you're using your respirator(s):

Name of the first toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

Name of the second toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

Name of the third toxic substance: _____

Estimated maximum exposure level per shift: _____

Duration of exposure per shift: _____

The name of any other toxic substances that you'll be exposed to while using your respirator:

_____

_____

_____

19. Describe any special responsibilities you'll have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, security):

_____

_____

_____

University of Vermont

APPENDIX E

Fit Test Standard Operating Procedures

(SOPs for QLFT and QNFT)

	Department:	Environmental Health and Safety		
	SOP Owner:	Occupational Health and Safety Office		
	SOP Title:	Qualitative Fit Testing Procedure		
	Date Created:	2025.03.12	**Updated:**	n/a

Standard Operating Procedure – Qualitative Fit Testing Procedure

1. Purpose

The purpose of this Standard Operating Procedure (SOP) is to identify the steps and procedures while conducting a qualitative fit test (QLFT) under the University of Vermont's (UVM) Respiratory Protection Program (RPP) while ensuring all regulations and safety expectations are being upheld.

Procedures in this SOP are intended for the use of specific protocols using testing agents Bitrex or Saccharin.

2. Scope

This SOP applies to UVM Personnel who have been properly trained and are the qualified or competent person able to perform fit testing for those required to utilize a respirator to conduct their work tasks and duties on and around campus at UVM. Style respirators include, but are not limited to, disposable filtering facepiece, tight fitting elastomeric half face or full facepiece, air-purifying, and powered air-purifying respirator (PAPR).

If administrative and engineering controls are ineffective in preventing atmospheric contamination potentially exposing a student, UVM will provide appropriate NIOSH approved respirators that shall be used pursuant to OSHA 1910.134. UVM Written Respiratory Protection Program can be found at this link: UVM's RPP.

3. Hazards

Air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors can caused illness and/or injury and even death when inhaled. Additional hazards include biohazardous agents, infectious agents, chemicals, oxygen deficient atmospheres, and pharmaceuticals.

If a UVM Personnel is not properly fitted to their assigned respirator, they are at risk to the aforementioned respiratory hazards.

4. Roles and Responsibilities

Department Administration:

1. Maintain and update Design Guidelines requiring that projects be designed according to current VOSHA standards and that hazard elimination, engineering controls, and administrative controls, for occupant use and maintenance work be designed into projects wherever feasible.
2. Provide administrative and financial support for this program within individual units.
3. Ensure that PPE is provided and maintained within the department.

Managers and Supervisors:

1. Ensure that employees are informed, trained, and provided with the appropriate PPE to be protected from identified hazards or potential hazards.
2. Coordinate the corrective actions required of hazards brought to their attention by employees.

3. Complete a "First Report of Injury" report and produce any additional documentation needed to investigate and work-related injuries and illnesses.

UVM Employees and Students:

1. Comply with safety regulations and recommendations provided by the supervisor and/or Occupational Health and Safety Office.
2. Complete training and request further instructions if unclear.
3. Conduct assigned tasks in a safe manner and wear all assigned PPE.
4. Report any unsafe or unhealth work conditions and job-related injuries and illnesses to the supervisor immediately.

5. Procedure

If instructed that it is required or recommended to utilize a respirator to conduct work tasks and duties on and around campus at UVM, a fit test is required prior to performing those tasks.

Preparation:

1. Attach hood to collar by placing drawstring between flanges on collar. Tighten drawstring and tie with square knot or bow.
2. Utilizing eye dropper #1, place a small amount (approximately one teaspoonful) of the Sensitivity Test Solution (#1) into the nebulizer labeled "#1 Sensitivity Test Solution."
3. Utilizing eye dropper #2, place the same amount of Fit Test Solution (#2) into the second nebulizer labeled "#2 Fit Test Solution."
4. Immediately recap the bottles.

Sensitivity Test:

This test is done to assure that the person being fit tested can detect either the sweet or the bitter taste of the test solution at very low levels. The Sensitivity Test Solution is a very dilute version of the Fit Test Solution. The test subject should not eat, drink (except water), or chew gum for 15 minutes before the test.

1. Have the test subject put on the hood and collar assembly without a respirator.
2. Position the hood assembly forward so that there is about six inches between the subject's face and the hood window.
3. Instruct the test subject to breathe through his/her mouth with tongue extended.
4. Using Nebulizer #1 with the Sensitivity Test Solution (#1), inject the aerosol into the hood through the hole in the hood window. Inject ten (10) squeezes of the bulb, fully collapsing and allowing the bulb to expand fully on each squeeze. Both plugs on the nebulizer must be removed from the openings during use. The nebulizer must be held in an upright position to ensure aerosol generation.
5. Ask the test subject if they can detect the sweet or bitter taste of the solution. If tasted, note the number of squeezes as 10 and proceed to the Fit Test.
6. If not tasted, inject an additional ten squeezes of the aerosol into the hood. Repeat with ten more squeezes if necessary. Note whether 20 or 30 squeezes produced a taste response.

7. If 30 squeezes are inadequate, in that the subject does not detect the sweet or bitter taste, the test is ended. Another type of fit test method must be used.
8. Remove the test hood and give the subject a few minutes to clear the taste from his/her mouth. It may be helpful to have the subject rinse his/her mouth with water.

Fit Test:

1. Have the test subject don the respirator and perform a user seal check per the manufacturer's instructions provided in the respirator package.
2. Have subject wear any applicable safety equipment that may be worn during actual respirator use that could interfere with respirator fit. The respirator must be worn at least 5 minutes before testing.
3. Have the subject put on and position the test hood as before and breathe through their mouth.
4. Using Nebulizer #2 with Fit Test Solution (#2), inject the fit test aerosol using the same number
5. of squeezes as required in the Sensitivity Test (10, 20, or 30). A minimum of ten squeezes is required, fully collapsing and allowing the bulb to expand fully on each squeeze. The nebulizer must be held in an upright position to ensure aerosol generation.
6. To maintain an adequate concentration of aerosol during this test, inject one-half the number of squeezes (5, 10, or 15) every 30-60 seconds, or between each exercise (a-g see below) for the duration of the fit test procedure.
7. Periodically check the nebulizer to make sure that it is not clogged. If clogging is found, clean the nebulizer and retest.
8. After the initial injection of aerosol, ask the test subject to perform the following test exercises for 60 seconds each:
    a. Normal breathing — In a normal standing position, without talking, the subject shall breathe normally.
    b. Deep breathing — In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.
    c. Turning head side to side — Standing in place, the subject shall slowly turn their head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.
    d. Moving head up and down — Standing in place, the subject shall slowly move their head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).
    e. Talking — The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite the alphabet.
    f. Bending over — The test subject shall bend at the waist as if they were to touch their toes. Jogging in place may be substituted for this exercise.
    g. Normal breathing — Same as exercise a.
9. The test is terminated at any time the sweet or bitter taste of aerosol is detected by the subject because this indicates an inadequate fit. Wait 15 minutes and perform the fit test again.

10. Repeat the fit test after redonning and readjusting the respirator. A second failure may indicate that a different size or model respirator is needed.
11. If the entire test is completed without the subject detecting the aerosol and without them touching or adjusting the respirator the test is successful, and respirator fit has been demonstrated.
12. Have the test subject doff the respirator properly and then clean or dispose of the respirator.
13. A hardcopy of the fit test record shall be filled out, signed by the operator and test subject, scanned and emailed to ohealth@uvm.edu, and the signed hardcopy goes with the test subject.

Cleaning:

At the end of each session or at least every four hours, discard the unused solutions from the nebulizers. DO NOT pour unused solutions back into bottles. Rinse the nebulizers with warm water to prevent clogging and shake dry. Wipe out the inside of the hood with a sanitizing wipe, damp cloth or paper towel to remove any deposited Test Solution. Sanitizing and cleaning methods as per respirator manufacturer's instructions may be used to clean non-disposable type respirators facepieces between fit tests.

6. Related Documents

- OSHA 1910.134 – https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134
- OSHA Informational Video – https://www.osha.gov/video/respiratory-protection/fit-testing

7. Definitions

Air-purifying respirator	a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.
Exposure	exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.
Filtering facepiece	a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.
Fit Test	the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual.
Loose-fitting Facepiece	a respiratory inlet covering that is designed to form a partial seal with the face.
Negative pressure Respirator	Tight Fitting respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.
NIOSH -	National Institute for Occupational Safety & Health
OSHA -	the Federal Occupational Safety and Health Administration.
Oxygen deficient atmosphere	an atmosphere with an oxygen content below 19.5% by volume.
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.

Tight-fitting facepiece	means a respiratory inlet covering that forms a complete seal with the face.
Voluntary Use	employee/student chooses to wear a respirator when use is not required by the employer or by an OSHA standard.

8. Photos

1. 3MTM Qualitative Fit Test Apparatus FT-10 (Sweet) and FT-30 (Bitter)

2. Illistration of fit test being conducted.

9. Resources

- 3M Occupational Health and Environmental Safety Division – 4075 Qualitative Fit Test Apparatus FT-10 (Sweet) and FT-30 (Bitter) Instructions for Use.
- OSHA 1910.134 Appendix A Part I Accepted Fit Test Protocols: https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134AppA

	Department:	Environmental Health and Safety		
	SOP Owner:	Occupational Health and Safety Office		
	SOP Title:	Quantitative Fit Testing Procedure		
	Date Created:	2025.03.12	**Updated:**	2025.11.25

Standard Operating Procedure – Quantitative Fit Testing Procedure

1. Purpose

The purpose of this Standard Operating Procedure (SOP) is to identify the steps and procedures while conducting a quantitative fit test (QNFT) under the University of Vermont's (UVM) Respiratory Protection Program (RPP) while ensuring all regulations and safety expectations are being upheld.

Procedures in this SOP are intended for the use of specific protocols utilizing either TSI Incorporated PortaCount® Pro Model 8038 or Model 8048 and TSI Incorporated Particle Generator Model 8026.

2. Scope

This SOP applies to UVM Personnel who have been properly trained and are qualified or competent person able to perform fit testing for those required to utilize a respirator to conduct their work tasks and duties on and around campus at UVM. Style respirators include, but are not limited to, disposable filtering facepiece, tight fitting elastomeric half face or full facepiece, air-purifying, and powered air-purifying respirator (PAPR).

If administrative and engineering controls are ineffective in preventing atmospheric contamination potentially exposing a student, UVM will provide appropriate NIOSH approved respirators that shall be used pursuant to OSHA 1910.134. UVM Written Respiratory Protection Program can be found at this link: UVM's RPP.

3. Hazards

Air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors can caused illness and/or injury and even death when inhaled. Additional hazards include biohazardous agents, infectious agents, chemicals, oxygen deficient atmospheres, and pharmaceuticals.

If UVM Personnel is not properly fitted to their assigned respirator, they are at risk to the aforementioned respiratory hazards.

4. Roles and Responsibilities

Department Administration:

1. Maintain and update Design Guidelines requiring that projects be designed according to current VOSHA standards and that hazard elimination, engineering controls, and administrative controls, for occupant use and maintenance work be designed into projects wherever feasible.
2. Provide administrative and financial support for this program within individual units.
3. Ensure that PPE is provided and maintained within the department.

Managers and Supervisors:

1. Ensure that employees are informed, trained, and provided with the appropriate PPE to be protected from identified hazards or potential hazards.
2. Coordinate the corrective actions required of hazards brought to their attention by employees.

3. Complete a "First Report of Injury" report and produce any additional documentation needed to investigate and work-related injuries and illnesses.

UVM Employees and Students:

1. Comply with safety regulations and recommendations provided by the supervisor and/or Occupational Health and Safety Office.
2. Complete training and request further instructions if unclear.
3. Conduct assigned tasks in a safe manner and wear all assigned PPE.
4. Report any unsafe or unhealth work conditions and job-related injuries and illnesses to the supervisor immediately.

5. Procedure

If instructed that it is required or recommended to utilize a respirator to conduct work tasks and duties on and around campus at UVM, a fit test is required prior to performing those tasks.

Preparation -

Setting Up and Using the TSI Particle Generator

The particle generator is intended to supplement the naturally occurring particles in the air when performing a quantitative respirator fit test using the TSI PortaCount.

1. Fill the reservoir jar with room temperature or warm water to the fill line.
2. Drop one salt tablet into the reservoir. Each tablet contains 100 mg of salt. Break or crush the tablet before dropping it into the reservoir to dissolve it more quickly.
3. Place the cover on the temporary cover on the reservoir jar and shake it gentle.
4. Once the solution is mixed, remove the temporary cover and screw the jar onto the particle generator.
5. Place the particle generator on the floor in the testing room. Make sure the ventilation louvers are not blocked or obstructed to prevent overheating.
6. Ensure the power cord is connected to the particle generator and the wall outlet and turn on the particle generator.
7. Run the particle generator in the testing room, with the door closed for 15 minutes before beginning a fit test.

Inserting a Test Probe in a Disposable Respirator

1. Choose a location to install the sample probe. For proper fit testing, the sampling point must be in the "breathing zone" of the respirator user. For most respirators, this is in the center of the respirator between the person's nose and mouth.
2. Slide the sampling probe onto the piercing tool. **As the pointed end of the piercing tool is very sharp, be extremely careful when handling it!**
3. Choose a location on the mask that is in front of the person's nose/mouth region. For most respirators, this is in the center of the respirator between the person's nose and mouth. For Flat "Duckbill" Style Respirators, install the probe near the outer edge of the bottom panel where it cannot be blocked by the person's chin. For Respirators with Center-Mounted Exhalation Valves, install the probe to the left or right of the valve. DO NOT install the probe above or below the

valve because this risks having the probe blocked by the person's nose or chin.Avoid seams and folds in the mask.

4. Pierce the mask at the selected location, using the piercing tool with the loaded sampling probe. **Be sure to pierce the mask from the inside!**
5. Load a sample probe onto the PortaPunch™ piercing tool.
6. Load a push nut onto the magnetic push nut tool on the PortaPunch™ tool. MAKE SURE THE CONCAVE SIDE OF THE PUSH NUT IS FACING UP.
7. Use the PortaPunch™ Probe Insertion Tool (with probe loaded) to puncture the respirator from the inside. It is not necessary to push the probe all the way through. All you need to do is get the point through far enough to be seen from the other side.
8. Next, press down on the PortaPunch™ lever arm to engage the push nut onto the exposed point poking through the respirator and firmly push them together as far as possible.
9. Release the PortaPunch™ lever arm and remove the respirator and inspect the sample port to make sure it is tightly secured and will not leak. You should not be able to rotate the probe with your fingers. If necessary, use the PortaPunch™ Probe Insertion Tool again to tighten the port.
10. Inspect the sampling probe to be sure it is not plugged. Try to rotate the probe with your fingers. If it moves freely, use the probe insertion tool kit to press the push nut firmly onto the sampling probe and pinch the mask material more tightly.

Using a Sampling Adaptor for Elastomeric Respirators

There are a growing number of respirator manufacturers who provide sampling adapters that permit fit testing. UVM's Fit Testing Room has in stock:

3M 601 Fit Test Adaptor
Honeywell North 770021 Fit Test Adaptor

The adaptor should replace the cartridge or filter on the side that places the port of the adaptor facing down. A P100 filter cartridge shall be placed on the other side on the respirator. The adaptor and filter cartridge shall be placed in a manner that they are not loose or too tight.

Preparing the TSI PortaCount

Step 1 – Alcohol Cartridge

Keep the storage cap and alcohol cartridge clean. Maintaining an adequate alcohol supply inside the PortaCount Pro fit tester is critical for its operation and requires strict adherence to the directions that follow.

1. Make sure the PortaCount Pro fit tester is turned off.
2. Remove the Alcohol Cartridge from the PortaCount Pro fit tester by twisting it counter-clockwise.
3. Open the Alcohol Fill Capsule by twisting the Storage Cap off (counter-clockwise).
4. Set the Storage Cap and Alcohol Cartridge down on a clean surface to prevent contamination.

5. Open a bottle of alcohol. Invert the bottle and insert the nozzle end into the Alcohol Fill Capsule as far as possible to make certain alcohol is not inadvertently sprayed anywhere except into the Capsule.
6. Squeeze alcohol into the Alcohol Fill Capsule until it is even with or slightly above the fill-line.
7. Recap the alcohol bottle immediately.
8. Make certain the alcohol cartridge is clean. If it has been contaminated, refer to the Service and Maintenance chapter in the manual and follow the instructions to replace it. If it is clean, insert the Alcohol Cartridge into the Alcohol Fill Capsule and turn the capsule clockwise until it locks in place.
9. Set the Alcohol Fill Capsule down and wait at least 2 minutes while the alcohol wick inside the Alcohol Cartridge soaks up alcohol.
10. Remove the Alcohol Cartridge from the Capsule and gently shake it to allow excess alcohol to drip back into the Alcohol Fill Capsule. Stop when excess alcohol is no longer dripping; it is not necessary to wait until the outside surface of the Alcohol Cartridge is dry.
11. Insert the Alcohol Cartridge into the Cartridge Cavity of the PortaCount Pro Respirator Fit Tester. It should slide in with little effort. **DO NOT FORCE IT**. As you approach full insertion, firmly twist the Alcohol Cartridge clockwise until it locks into position.
12. Recap the alcohol fill capsule with the storage cap.

Step 2 – Turning on Porta Count and Run Daily Checks

1. Ensure that the sampling tubes are connected to the correct ports.
2. Ensure that the AC Adaptor is connected to the instrument and turn on the PortaCount Pro fit tester using the O/I button. The PortaCount Pro fit tester goes through a warm-up period before it is ready to use.
3. Ensure the USB cable is connected to the desktop computer and open the FitPro+ software.
4. Open and Start the PortaCount Fit Tester and FitPro Ultra Software on the computer.
5. Enter the operators initials in the Operator Login screen, and hit continue.
6. Select connect to the PortaCount in the Main menu and then select Daily Check from the PortaCount menu. The Daily Check screen will be displayed.
7. The automated Daily Check program will give you step-by-step instructions. Ensure that the “N95 Companion” is selected when fit testing for respirators with less then a 99 rating.
8. TSI strongly recommends performing daily checks every day before you begin fit testing and anytime you suspect an instrument malfunction. If the instrument passes the daily check, it indicates the PortaCount Pro Fit Tester is in good working order.

Step 3 – Begin the Fit Test

1. Once FitPro+ is running, start a fit test by selecting PortaCount | Fit Test from the menu or click the icon in the Activities Tabs.
2. Make certain the exercise protocol OSHA 29CFR1910.134 is shown beneath 'Protocol'.
3. Enter the operator's first initials and last name in the Operator field. This is a required field.
4. Select the name of the test subject from the database. The default search value is Last Name, but you can also select in settings to search different values: First Name, ID Number, Company or

Location. You can add a new person to the People Tab by selecting <ADD NEW PERSON…>. A window opens to enter the information for record, click SAVE and EXIT. When the correct subject is displayed, information is automatically filled in. (First Name, Last Name, ID Number, etc.).

5. Select an available Respirator for the subject using the drop-down box. The list of available respirators is limited by the model of the connected PortaCount Fit tester. A new Respirator can be added by selecting, <ADD NEW RESPIRATOR…> from the Respirator drop down list. A window opens to enter the information for record, click SAVE and EXIT.
6. Select a Mask Size for the subject using the drop-down box. The drop-down box will include sizes entered previously for other fit tests. A new size can also be entered.
7. Make certain the PortaCount Pro Fit Tester sample tube (clear tube) is connected to the respirator and ask the test subject if they are ready to begin the exercise protocol.

Fit Test

1. Have the test subject don the respirator and perform a user seal check per the manufacturer's instructions provided in the respirator package.
2. Have subject wear any applicable safety equipment that may be worn during actual respirator use that could interfere with respirator fit. The respirator must be worn at least 5 minutes before testing.
3. Have the subject put on and position the lanyard to hold the sampling tube from pulling on the respirator during the fit test.
4. Click START. Fit testing begins immediately, and the first exercise description appears. The exercises proceed one after another without pause.
5. Ask the test subject to perform the following test exercises for 60 seconds each:
    a. Normal breathing — In a normal standing position, without talking, the subject shall breathe normally.
    b. Deep breathing — In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as not to hyperventilate.
    c. Turning head side to side — Standing in place, the subject shall slowly turn their head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.
    d. Moving head up and down — Standing in place, the subject shall slowly move their head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).
    e. Talking — The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from 100, or recite the alphabet.
    f. Bending over — The test subject shall bend at the waist as if they were to touch their toes. Jogging in place may be substituted for this exercise.
    g. Normal breathing — Same as exercise a.

6. The dialog box displays “Fit Test Completed” when the fit test is complete. The Test Status box displays either “Pass” or “Fail” and the Fit Test fit factor. Pass or fail is determined by comparing the overall fit factor to the Fit Factor Pass Level.
7. If the fit test failed, repeat the fit test after redonning and readjusting the respirator. A second failure may indicate that a different size or model respirator is needed.
8. If the entire test is completed without the subject touching or adjusting the respirator and the overall required fit factor is met to pass, the test is successful, and respirator fit has been demonstrated.
9. Have the test subject doff the respirator properly and then clean or dispose of the respirator.
10. A hardcopy of the fit test record shall be printed, signed by the operator and test subject, scanned and emailed to ohealth@uvm.edu, and the signed hardcopy goes with the test subject.

Post Fit Test and Cleaning -

Turn off the PortaCount, return the alcohol cartridge to the alcohol fill capsule, and then put the storage cap back onto the cartridge cavity.

Turn off the particle generator and detach the reservoir jar. The salt solution can be saved and re-used storing it with the temporary cap. Do Not mix old solution with new or fresh solution. After removing the jar, switch the generator back on for about 40 seconds.

Wipe any salt solution spills and occasionally wipe down working surfaces and outside of the equipment if visually contaminated.

At the end of each session sanitizing and cleaning methods as per respirator manufacturer’s instructions may be used to clean non-disposable type respirators facepieces between fit tests.

6. Related Documents

- OSHA 1910.134 - https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134
- OSHA Informational Video - https://www.osha.gov/video/respiratory-protection/fit-testing

7. Definitions

Air-purifying respirator	a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.
Exposure	exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.
Filtering facepiece	a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.
Fit Test	the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual.
Loose-fitting Facepiece	a respiratory inlet covering that is designed to form a partial seal with the face.

Negative pressure Respirator	Tight Fitting respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.
NIOSH -	National Institute for Occupational Safety & Health
OSHA -	the Federal Occupational Safety and Health Administration.
Oxygen deficient atmosphere	an atmosphere with an oxygen content below 19.5% by volume.
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.
Tight-fitting facepiece	means a respiratory inlet covering that forms a complete seal with the face.
Voluntary Use	employee/student chooses to wear a respirator when use is not required by the employer or by an OSHA standard.

8. Photos

1. TSI PortaCount QNFT setup.

2. TSI Particle Generator

9. Resources

- TSI PortaCount 8038 Operations and Service Manual, and User's Manual.
- OSHA 1910.134 Appendix A Part I Accepted Fit Test Protocols: https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.134AppA

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APPENDIX F

Fit Test Record

(examples for QLFT and QNFT)

University of Vermont

Department of Environmental Health and Safety
Occupational Health and Safety Office
ohealth@uvm.edu ● 802.656.7233 (SAFE)

FIT TEST RECORD

SUBJECT'S NAME: _____

NETID: _____

DATE: _____

TESTED BY: _____

TEST METHOD: **1910.134 Appendix A, Qualitative Fit Test Protocols**

TESTING AGENT: ☐ **Bittrex** ☐ **Saccharin** ☐ **Irritant Smoke**

RESPIRATOR: _____
Make/Model

SIZE: _____

RESULTS:

Sensitivity Test ☐ 10 ☐ 20 ☐ 30		
Normal Breathing	☐ PASS	☐ FAIL
Deep Breathing	☐ PASS	☐ FAIL
Turning Head Side to Side	☐ PASS	☐ FAIL
Moving Head Up and Down	☐ PASS	☐ FAIL
Talking	☐ PASS	☐ FAIL
Bending Over	☐ PASS	☐ FAIL
Normal Breathing	☐ PASS	☐ FAIL
At any point of the fit test, did the subject experience tasting the testing agent, or notice a change or sensation in nose, mouth, or throat?	☐ No	☐ Yes
The respirator should fit tight or snug, but not painful, at any point of the fit test, did the subject experience pain or discomfort?	☐ No	☐ Yes
Does the subject feel that they can wear the respirator for partial or an entire work shift?	☐ No	☐ Yes
Respirator fit has been demonstrated as a:	☐ **PASS**	☐ **FAIL**

SIGNATURES

TEST OPERATOR: _____ **Date:** _____

TEST SUBJECT: _____ **Date:** _____

RETEST DUE DATE: _____

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APPENDIX G

Respirator Inspection Checklist

University of Vermont

Department of Environmental Health and Safety
Occupational Health and Safety Office
ohealth@uvm.edu ● 802.656.7233 (SAFE)

Respirator Inspection Checklist

Employee/Student Information		
Last Name	First Name	Middle Initial (*optional*)
UVM NETID	Email	Phone (*optional*)

Type of Respirator Use

☐ **Required Use**

☐ **Voluntary Use**
For Voluntary Use, have you been provided OHSA 29 CFR 1910.134 Appendix D ("Information for Employees Using Respirators When Not Required Under the Standard")?
☐ YES
☐ NO

Type of respirator

☐ Disposable Filtering Facepiece (N95, dust mask)	☐ Loose Fitting or Hood Powered Air Purifying Respirator (PAPR)	☐ Full Face SCBA in demand mode
☐ Elastomeric Half Face Air Purifying Respirator (APR)	☐ Elastomeric Half Face Powered Air Purifying Respirator (PAPR)	☐ Full Face SCBA in positive pressure mode
☐ Elastomeric Full Face Air Purifying Respirator (APR)	☐ Elastomeric Full Face Powered Air Purifying Respirator (PAPR)	☐ Other (*specify*):

Size, Make, and Model Respirator

Facepiece	Cracks, Tears, or Holes	☐ Yes	☐ No
	Face Mask Distortion	☐ Yes	☐ No
	Cracked or Loose Lenses/Face Shield	☐ Yes	☐ No
Head Straps	Breaks or Tears	☐ Yes	☐ No
	Broken Clasps or Buckles	☐ Yes	☐ No
Valves	Residue or Dirt	☐ Yes	☐ No
	Brittle, Cracks, or Tears in Valve Material	☐ Yes	☐ No
Elastomeric Parts	Non-Pliable or Brittle	☐ Yes	☐ No
	Deterioration or Distortion	☐ Yes	☐ No
Filters/Cartridges	Improper Filter/Cartridge for Hazard(s)	☐ Yes	☐ No
	Gaskets Broken or Deteriorating	☐ Yes	☐ No
	Cracks or Dents in Housing	☐ Yes	☐ No
Air Supply Systems	Breathing Air Quality/Grade	☐ Yes	☐ No
	Good Condition of Hoses and Connections	☐ Yes	☐ No
	Proper Settings on Regulators and Valves	☐ Yes	☐ No

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APPENDIX H

Respirator Cartridge, Canister, & Filter Color Coded Selection Chart

University of Vermont

Department of Environmental Health and Safety
Occupational Health and Safety Office
ohealth@uvm.edu ● 802.656.7233 (SAFE)

RESPIRATOR CARTRIDGE, CANISTER, & FILTER COLOR CODED SELECTION CHART

Disclaimer: This chart is to be used as general guidance for respirator cartridge, canister, or filter selection. Always read the label on the product and refer to the manufacturer's manual for information and recommendations.

Reminders:

1) Cartridges, canisters, and filters should be selected based on the type and concentration of the contaminant(s) present or have potential to be present.
2) Follow manufacturer's instructions for cartridge/canister/filter change out schedule.
3) Contact EHS for assistance with proper cartridge/canister/filter selection.

Contaminant(s)	Color Coding on Cartridge/Canister/Filter	Primary Color	Secondary Color	Tertiary Color
Acid Gases	White		N/A	N/A
Acid Gases & Organic Vapors	Yellow		N/A	N/A
Acid Gases & Organic Vapors & Particulates	Yellow & Purple (Magenta) combination			N/A
Acid Gases & Particulates	White & Purple (Magenta) combination			N/A
Acid Gases and Ammonia Gas	Green with 1/2 inch white stripe completely around the canister near the bottom			N/A
Acid Gases, Organic Vapors, and Ammonia Gases	Brown		N/A	N/A
Ammonia Gas	Green		N/A	N/A
Ammonia Gas & Particulates	Green & Purple (Magenta) combination			N/A
Any Particulates - P100 (HEPA Filter)	Purple (Magenta)		N/A	N/A
Any Particulates - P95, P99, R95, R99, R100 (Non-HEPA Filter)	Orange		N/A	N/A
Any Particulates Free of Oil - N95, N99, N100	Teal			N/A
Carbon Monoxide	Blue		N/A	N/A
Chlorine Gas	White with 1/2 inch yellow stripe completely around the canister near the bottom			N/A
Hydrocyanic Acid Gas	White with 1/2 inch green stripe completely around the canister near the bottom			N/A
Hydrocyanic Acid Gas and Chloropicrin Vapor	Yellow with 1/2 inch blue stripe completely around the canister near the bottom			N/A
Mercury Vapor & Chlorine Gas & Particulates	Orange & Purple (Magenta) combination			N/A
Multi-Contaminant and CBRN Agent (Chemical, Biological, Radioactive, Nuclear)	Olive (NOTE: Must state "CBRN" on Canister)		N/A	N/A
Multi-Gases & Vapors	Olive		N/A	N/A
Multi-Gases & Vapors & Particulates	Olive & Purple (Magenta) combination			N/A
Organic Vapors	Black		N/A	N/A
Organic Vapors & Particulates	Black & Purple (Magenta) combination			N/A
Pesticides	Organic Vapor plus Particulate - Black & Purple (Magenta) combination			N/A
Radioactive Materials, except Tritium & Noble Gases	Purple (Magenta)		N/A	N/A
Formaldehyde & Organic Vapor & Particulates	Black & Olive & Purple (Magenta)			