**REVISION HISTORY**

|  |  |  |  |
| --- | --- | --- | --- |
| **Revision**  | **Reserved** | **Document/ Change Summary** | **Document Lead** |
| 2018-00 |  | Incorporate student use of respirator content | EHS – THD |
| 2016-00 |  | OSHA content, program format (10-03-16) | EHS – THD |
| 2002, 2007 |  | Previous versions on file at EHS |  |

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1. **STATEMENT OF PURPOSE**

Penn State employees, and in some cases, affected students (respirator users) may be exposed to respiratory hazards during their work. These hazards may include airborne particulates, vapors and gases. The purpose of this Penn State Respiratory Protection Program is to ensure that all University employees are protected from exposure to these respiratory hazards.

When necessary to control exposures to air contaminants, engineering controls such as ventilation, and other means of control such as good housekeeping, work procedures, and substitution of less toxic materials, are the first lines of protection. Where these preferred controls are not feasible or cannot completely control the hazards, then personal protective equipment, including respirators are required. Respirators are also needed to protect employees' health during emergencies.

In addition, some respirator users may desire to wear respirators during certain tasks that do not require respiratory protection, but which may be used to reduce nuisance levels of air contaminants in their work environment. Such “voluntary use” of respirators may be provided, where approved by a respirator user’s Supervisor, and Safety Officer. Typically, Penn State can support the use of filtering-facepiece respirators (dust masks) for voluntary use. In certain special circumstances, other types of respirators may be approved for voluntary use; however, these typically necessitate the employee to be enrolled in other facets of the Penn State respiratory protection program. These requirements are further outlined in the Scope and Application section below.

1. **INTRODUCTION**

The Occupational Safety & Health Administration (OSHA) promulgated the respiratory protection standard, to address the need for respiratory protection by workers, particularly where air contaminant exposures cannot be readily or immediately controlled by other means, such as by engineering or administrative controls. The [OSHA Respiratory Protection Standard](https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=12716%20)

is cited at Title 29, Part 1910 of the Code of Federal Regulations (29 CFR 1910.134) for General Industry, and at 29 CFR 1926.103 for Construction.

The Penn State University has numerous work and academic operations across the Commonwealth of Pennsylvania. Certain task operations may require the use of respirators. Respirator use requirements are determined by the risk/ hazard assessment conducted by the responsible academic or work unit, department and/or staff organization, with assistance and support by EHS. Such task operations may be intermittent, and of a construction nature, or these may be associated with more consistent laboratory or maintenance operations.

Refer to the subsequent sections of this Penn State Respiratory Protection Program for further details.

1. **SCOPE AND APPLICATION**

This program applies to Penn State employees, and in some cases students (respirator users) at all locations except the Hershey Medical Center, College of Medicine, and the Pennsylvania College of Technology, who are required to use, and who may voluntarily use respirators. Such respirator use may occur during normal work operations, and/or during certain non-routine periods. Respirator use may also be necessary during certain emergency operations such as during or following a spill or leak, or supporting the clean-up of a hazardous substance.

Penn State respirator users participating in the Penn State Respiratory Protection Program do so at no cost to them. The expense associated with training, medical evaluations, fit testing, equipment and other aspects is incurred by Penn State.

1. **TERMS AND DEFINITIONS**

The following terms and definitions are primarily referenced from the Occupational Safety and Health Administration’s *(OSHA) Respiratory Protection Standard*. Refer to subsequent OSHA Respiratory Protection Standard definition.

*Air-purifying respirator* (APR) – a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

*Assigned protection factor* (APF) – the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when the employer implements a continuing, effective respiratory protection program as specified by the OSHA Respiratory Protection standard.

*Atmosphere-supplying respirator –* 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* – a container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.

*Demand or pressure demand respirator* – 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* – 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.

*Exposure* – exposure to a concentration of an airborne contaminant that would occur if the respirator user were not using respiratory protection.

*End-of-service-life indicator (ESLI)* – 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 or escape respirator* – a respirator intended to be used only for emergency exit.

*Filter or air purifying element* – a component used in respirators to remove solid or liquid aerosols from the inspired air.

*Filtering-facepiece (dust mask)* – 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 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* (respirator fit test) – the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. Refer also to Qualitative fit test QLFT and Quantitative fit test QNFT.

*Helmet* – a rigid respiratory inlet covering that also provides head protection against impact and penetration.

*High efficiency particulate air (HEPA) filter* – a filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent National Institute of Occupational Safety and Health (NIOSH) particulate filters are the N100, R100, and P100 filters, as specified at Title 42 CFR Part 84.

*Hood* – 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)* – 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. Refer to 29 CFR 1910.155.

Note: Penn State employees are not involved in assigned duties which involve interior structural firefighting. Certain Penn State employees may serve in a voluntary or other capacity as firefighters apart from Penn State.

*Loose-fitting facepiece* means a respiratory inlet covering that is designed to form a partial seal with the face.

*Maximum use concentration (MUC)* – the maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the required OSHA permissible exposure limit, short-term exposure limit, or ceiling limit. When no OSHA exposure limit is available for a hazardous substance, an employer must determine an MUC on the basis of relevant available information and informed professional judgment.

*Negative pressure respirator (tight fitting)* – a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.

*OSHA Respiratory Protection Standard –* The Occupational Safety and Health Administration’s respiratory protection standard as cited at 29 CFR 1910.134 applicable to general industry, 29 CFR 1926.103 (construction), 29 CFR 1915.154 (shipyards), 29 CFR 1917.92 (marine terminals), 29 CFR 1918.102 (long-shoring).

*Oxygen deficient atmosphere* – an atmosphere with an oxygen content below 19.5% by volume.

*Physician or other licensed health care professional (PLHCP)* – 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 (e) of this section.

*Positive pressure respirator* – a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.

*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. NOTE: PAPR’s are designed to operate as a positive pressure respirator, but depending on type, may also operate without blower as a negative pressure respirator.

*Pressure demand respirator* – 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)* – 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)* – an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.
*Respiratory inlet covering* – 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)* – an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

*Service life* – 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* – an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.

*Tight-fitting facepiece* – a respiratory inlet covering that forms a complete seal with the face.

*User seal check* – an action conducted by the respirator user to determine if the respirator is properly seated to the face.

1. **ROLES AND RESPONSIBILITIES**
	1. **Budget Executives and Administrators**

Primarily responsible for budgeting and overall program support.

5.1.1 Ensure that responsibilities assigned within this program are carried out within their administrative work unit.

5.1.2 Designate individuals responsible for the implementation of this program within their work unit.

5.1.3 Actively support this program as part of the work unit’s overall safety effort.

5.1.4 Ensure adequate funding is available to support this program.

* 1. **Location or Work Unit Program Administrator (LPA)**

Responsible for coordination and implementation of this RPP at the work unit level. This person is typically the work unit or college safety officer, or campus liaison, but may be an assignee.

Other responsibilities include:

5.2.1 Ensures the RPP is locally distributed to affected faculty, staff/ employees, and students and ensure that RPP requirements are understood and implemented by participants,

5.2.2 Ensures that local management is apprised of updated RPP requirements and necessary support needed to meet updated requirements,

5.2.3 Arranges/ coordinates, supports, conducts or assists with work unit personnel training,

5.2.4 Inspect or monitor respirator program and respirator use to ensure that respirators are used in accordance with Penn State requirements,

5.2.5 Verify proper storage and maintenance of respiratory protection equipment,

5.2.6 Coordinate personnel involvement in respirator medical surveillance and fit-testing,

5.2.7 Maintain records required by the program,

5.2.8 Ensure that new employees receive appropriate training, fit testing and medical evaluation, prior to beginning duties which require respirator use,

5.2.9 Verify the availability of appropriate respirators and accessories,

5.2.10 Assist the Program Manager with periodic respiratory protection program review.

5.3 **Program Manager – Environmental Health & Safety (PM)**

Responsible for general development, implementation and guidance related to the program, and related oversight of the program per PSU Safety Policy SY-1.

Other responsibilities include:

5.3.1 Evaluate and identify work areas, hazards, processes or tasks, in coordination with the college and/or work unit safety officer, or campus safety liaison to determine required or voluntary respirator use,

5.3.2 Assist LPA’s or others to select respiratory protection options for users,

5.3.3 Conduct, arrange, or refer respirator fit testing to Occupational Medicine or other qualified providers,

5.3.4 Periodically review, evaluate and update/ revise the respiratory protection program contents, as required.

5.4 **Location/ Departmental Supervisors**

Supervisors are responsible for ensuring that the Respiratory Protection Program is implemented in their particular areas, as pertinent. Supervisors must be knowledgeable in RPP requirements, and be capable to support the effective understanding by affected employees under their charge.

Other responsibilities include:

5.4.1 Ensure that employees (including new hires) and affected students have received appropriate training, fit testing and medical evaluation, prior to performing duties requiring respirators,

5.4.2 Provide for and ensure the availability of appropriate respirators and accessories,

5.4.3 Be aware of tasks requiring the use of respiratory protection,

5.4.4 Enforce the proper use of respiratory protection, when necessary,

5.4.5 Ensure that respirators are properly cleaned, maintained and stored according to the manufacturers’ recommendations and/or the Respiratory Protection Program,

5.4.6 Ensure that respirators fit well and do not cause discomfort,

5.4.7 Be aware of work areas and/or operations which may involve possible respiratory hazards, and communicate these with the work unit or college Safety Officer or safety liaison,

5.4.8 Work with the LPA\Safety Officer to identify and address respiratory hazards, and to assist the Safety Officer, and Environmental Health and Safety (EHS), with evaluating environments and apprising parties of process changes, that may impact needs for respiratory protection.

5.5 **Employees and Respirator User**

Each respirator user is responsible to wear the required respirator (s) in the manner in which they were trained, and to participate in the RPP, as required.

Other responsibilities include:

5.5.1 Maintain their respirators properly, and store them in a clean, sanitary location,

5.5.2 Inform their supervisor if the respirator no longer fits well, if parts are worn or damaged, and to request a replacement,

5.5.3 Inform their Supervisor or the Local Program Administrator of any exposure hazards which may require respirators as related to their work duties, or their work environments, and/or to obtain assistance with questions or to provide input regarding the respiratory protection program.

**6.0 PROGRAM ELEMENTS**

6.1 **Respirator Types and Usage Requirements**

6.1.1 Required Respirator Use – All Tight-Fitting, Loose-Fitting, and Filtering-Facepiece (Dust Mask) Respirators

Any respirator user who is required to wear a tight-fitting respirator, including: filtering-facepiece types and/or tight-fitting air-purifying respirators (APR’s), powered air-purifying respirators (PAPRs), air-supplying respirators (ASR’s), and self-contained breathing apparatus (SCBA’s) are subject to the medical evaluation, respirator fit-testing, training, and cleaning, maintenance and storage requirements of this program, and must be provided with information specified in the program.

6.1.2 Voluntary Respirator Use – Filtering-Facepiece (Dust Mask Respirators

Any respirator user who is approved for voluntary use of a filtering- facepiece for comfort or nuisance level protection, is NOT subject to the medical evaluation and fit-testing requirements of this program; however, they are required to receive a review of the contents of Appendix D of OSHA’s respiratory protection standard found at Title 29 Part 1910.134 of the Code of Federal Regulations. This should include clarification of limitations, proper use, maintenance and clean storage of dust masks.

6.1.3 Voluntary Respirator Use – Any Other Tight-Fitting Facepiece

Respirator users who are approved for voluntary respirator use of any other type of tight-fitting respiratory protection are subject to the medical evaluation provisions, fit testing and other required elements of this respiratory protection program.

6.1.4 Voluntary Respirator Use – Loose-Fitting Facepiece Respirators (including PAPR’s)

Respirator users who are approved for voluntary respirator use of any loose-fitting types of respirators, such as PAPR helmet or hood style respirators, are NOT required to receive medical evaluation, and respirator fit-testing, but are required to receive training in the limitations, proper use, cleaning/ maintenance and storage of respirators.

 6.1.5 Emergency Response Respirator Use

Appendix E is reserved for areas or processes that have been identified as having foreseeable emergencies. Specific procedures for each area or process are described in the appendix, as needed.

 6.1.6 Respirator Malfunction

6.1.6.1 Air-Purifying Respirator Malfunction

For any malfunction of an APR, noticeable by detectable chemical breakthrough/odor, or other means, and due to face piece leakage, an improperly working valve, etc., the respirator user shall immediately leave the work area to a safe location, to attend to the respirator malfunction.

The respirator user shall inform their supervisor that the respirator no longer functions as intended. The supervisor must ensure that the employee receives the needed parts to repair the respirator, or is provided with a new respirator of the same make, model and size. The respirator user shall not re-enter the work area without successfully performing the necessary user seal checks.

6.1.6.2 Supplied Air Respirator Malfunction

All respirator users utilizing SARs, where such use is critical to life or safety, shall work in pairs. Coworkers shall assist workers who experience an SAR malfunction as follows:

If a respirator user experiences a malfunction of an SAR, he or she should signal to the coworker that he or she has had a respirator malfunction. The coworker (wearing an SAR) shall aid the worker to immediately exit the work area.

Further notification shall be made to the respirator user’s Supervisor of the malfunction. Re-entry to the work area may only be conducted following re-issuance or provision of a properly functioning respirator.

 6.2 **Respirator Selection Procedures**

EHS, in coordination with the LPA will select appropriate respirators in accordance with OSHA and applicable regulatory standards. As part of determining needed respiratory protection, exposure assessments shall be conducted or arranged, supporting appropriate respirator selection.

Respirators shall be selected from the Approved Respirator Selection List at Appendix A, and according to procedures at Appendix C.

6.2.1 Hazard/ Task Evaluations

6.2.1.1 If a respirator user or Supervisor believes that respiratory protection is needed during a particular task, they should contact their supervisor, College or Department Safety Officer, or LPA for assistance in making the determination. The Safety Officer(s) and/or LPA should subsequently contact EHS for assistance.

 Such hazard evaluations may be requested by chemical product end-users, work area supervisors, employees, researchers, safety officers, or other parties, where hazardous exposure potentials may be suspected.

 The College or Department Safety Officer, or LPA shall consult and/or contact EHS for assistance in evaluating such exposure risks. EHS may be contacted by any parties, as needed to clarify concerns or needed action or support.

 The Safety Officer or LPA in consultation with EHS shall review work processes to determine where potential exposures to hazardous substances may occur. This review may include surveying the workplace, reviewing process records and talking with employees and supervisors, as applicable.

 Subsequent hazard/ exposure evaluations may be conducted or arranged by EHS as needed to determine exposure levels to such agents, and whether such exposure levels may exceed pertinent occupational exposure criteria, such as the OSHA Permissible Exposure Limits (PEL’s) or American Conference of Governmental Industrial Hygienists Threshold Limit Values (TLV’s), or other advisory levels, as applicable.

6.2.2.2 EHS in coordination with the Safety Officer or LPA will conduct or arrange the exposure evaluation.

6.2.2.3 The results of the assessment/evaluation shall be reported to the Safety Officer or LPA with follow-up reporting to the monitored and affected employees. Certain OSHA requirements necessitate exposure results found to exceed OSHA PEL’s, and actions being taken to reduce or control exposures must be reported to affected employees. Contact EHS for assistance.

6.2.2.4 If respiratory protection is necessary, all other elements of this program will be in effect for those tasks, and the program and procedures will be updated accordingly. A Respirator User Selection Record is provided at Appendix B, for the location to document respirator selection for a respirator user.

6.3 **NIOSH Certification of Respirators**

 The National Institute of Occupational Safety and Health (NIOSH) is responsible for testing and approving respirator systems (respirator components as a complete system). Any use or alteration of respirator manufacturer parts, not specified by the manufacturer is a violation of OSHA standard requirements. NIOSH respirator approvals were detailed previously at 30 CFR Part 11. Current NIOSH respirator approvals are regulated at 40 CFR Part 84 (effective since July 10, 1995). Since this time, NIOSH has expanded responsibilities at the new regulation.

6.4 **Medical Evaluation**

Respirator users who are required to wear tight-fitting respirators must first pass a medical evaluation. Respirator users are not permitted to obtain or wear tight-fitting respirators (except voluntary use dust masks), until a physician, or approved medical professional, has determined that they are medically fit to use the respirator. Typically, these will be coordinated through Penn State Occupational Medicine, or the Campus designated medical panel physician/ designated services.

 6.4.1 Medical Evaluation Procedures

Medical evaluation procedures are as follows:

 6.4.1.1 Medical Evaluation Questionnaire

The Penn State authorized respirator user must complete the medical evaluation questionnaire provided by Penn State Occupational Medicine, and return to PS Occupational Medicine for review. The questionnaire is based on information requirements established by OSHA. All affected employee/ users will complete the medical questionnaire, and will be permitted to complete the questionnaire during normal working hours.

6.4.1.2 Medical Review/Exams

Medical review/exams will be granted to authorized Penn State respirator users as required by the OSHA standard, and/or as deemed necessary by the medical professional in coordination with EHS and the LPA. Additional or further medical evaluations/ exams shall be conducted in accordance with the OSHA respirator standard paragraph (e), and otherwise at the discretion of the examining physician(s) and/or Penn State Occupational Medicine department.

6.4.1.3 All affected respirator users will be granted the opportunity to speak with the medical professional about their medical evaluation, as requested.

6.4.1.4 The medical evaluation professional shall be provided a copy of the OSHA respirator standard, and this program manual, upon request.

6.1.4.5 As part of the medical evaluation, the medical professional will review the hazardous substances that employees may be exposed to, work area, job title, proposed respirator type and weight, length of time required to wear the respirator, expected physical workload (light, moderate or heavy), potential temperature and humidity extremes and additional protective clothing required. EHS is also available for assistance or information, as requested.

 6.4.1.6 Medical Evaluation Records

All medical examination records and questionnaires are to remain confidential between the employee and medical professional; except that verification of successful medical and respirator fit exams shall be provided to the LPA for a give respirator user. The verification shall include the following types of information:

* Respirator user name,
* Date(s) of medical and fit tests,
* Make/model/size of respirators successfully fitted,
* Type of fit test employed,
* date due for annual fit test, and
* Specific respirator use limitations or disqualifications.

 6.4.1.7 Eyeglass Prescription – Respirator Inserts

 Respirator users who require corrective lenses must work with their LPA to secure prescription eyeglass inserts/respirator adaptor kits suitable for the respirator to be used. Such inserts must be properly inserted prior to any required respirator use.

 Contact lenses may be used supporting prescription eyeglass requirements; however, contact lenses are not advised for use in dusty environments with half-face APR respirators, and/or with full-face APRs or other types, where hazardous gases or dusts may accumulate behind the contact lens, causing damage to the cornea or eye.

6.5 **Respirator Fit Testing**

Fit testing is required for respirator users required to wear tight-fitting Air Purifying Respirators (APRs), Powered Air Purifying Respirators (PAPRs) and Supplied Air Respirators (SARs), including Self-Contained Breathing Apparatus (SCBA’s), except that employees are not required to be fit tested where approved for voluntary use of filtering face piece respirators (i.e. dust masks).

Fit testing shall be conducted by Penn State Occupational Medicine, by EHS, or by designated providers or assignees approved by EHS.

 6.5.1 Respirator Fit Testing Frequency

Employees shall be fit tested:

6.5.1.1 Prior to required use of any respirator with a tight-fitting facepiece.

 6.5.1.2 Annually thereafter, as long as respirator use is required.

6.5.1.3 When there are changes in the employee's physical condition that could affect respirator fit (e.g., obvious change in body weight, facial scarring, etc.).

6.5.1.4 Employees will be fit tested with the make, model and size of respirator they will wear on the job. Fit testing of PAPRs with tight-fitting facepieces shall be conducted in the negative pressure mode.

6.5.1.5 Fit testing shall be conducted following OSHA approved methods. Refer to Appendix C for fit testing protocol. Appendix D – EHS Respirator Fit Testing Form is provided for optional use.

 6.5.2 Respirator Fit Test Scheduling

Respirator fit testing should be coordinated through the LPA. The work unit respirator user or their supervisor shall schedule respirator fit testing with Penn State Occupational Medicine, or the approved respirator fit testing agent.

 6.5.3 Respirator Fit Testing Records Storage

6.5.3.1 Respirator fit test records shall be maintained by Penn State Occupational Medicine, EHS, or the EHS-approved respirator fit test agency that has conducted fit testing, and for the duration of applicable respirator use by the applicable employee.

6.5.3.2 Verification of a successful respirator fit test by an employee shall be provided to the employee, and to the applicable LPA or designee, also as previously noted at section 6.4.1.6.

6.6 **IDLH Procedures**

If Immediately Dangerous to Life or Health (IDLH) contaminant levels are known or suspected at any time, the area shall be vacated and EHS shall be notified immediately.

Appendix F is reserved for areas known to have the potential for IDLH conditions.

6.7 **Air-Quality for Supplied Air Respirators**

Only Grade D breathing air shall be used with SAR systems, whether supplied in cylinders, or via Grade D breathing air systems.

6.7.1 Penn State locations will coordinate deliveries of breathing air cylinders with the University’s vendor(s) and require them to certify that the air in the cylinders meets the specifications of Grade D breathing air, where such cylinders are required for use. Similarly, any compressor equipment must be certified to deliver Grade D quality air for SAR systems.

6.7.2 The location which utilizes SAR’s must maintain an emergency supply of Grade D breathing air, whenever Grade D breathing air is in use.

6.7.3 Provisions must be made to safely evacuate personnel from work environments in which Grade D breathing air is required to be used, or, to ensure that an adequate supply of Grade D breathing air is immediately available in event of equipment failure or required emergency supply.

6.8 **Respirator Cleaning, Inspection, Maintenance and Storage**

 Detailed requirements of respirator cleaning, inspection, maintenance, and storage are subsequently presented. Each work unit is responsible for the cleaning, inspection, maintenance and storage/replacement of their applicable respirators.

 6.8.1 Provision of Supplies

 Each Penn State location or work unit must ensure that an adequate supply of pertinent respirators, cleaning and disinfection supplies, and replacement parts are available for required or approved voluntary respirator use at the location.

6.8.1.1 Respirator users must notify their supervisor or designee whenever such respirator replacement materials or supplies are needed or required, and respirator program parts and supplies must be maintained ready for use.

 6.8.2 Respirator Cleaning & Disinfection

The following procedure is to be used when cleaning and disinfecting respirators:

6.8.2.1 Disassemble the respirator, removing any filters, canisters or cartridges.

6.8.2.2 Wash the face piece and associated parts (except the cartridges, which should never be allowed to get wet) in a mild detergent with warm water. Do not clean or wash with organic solvents, etc.

6.8.2.3 Rinse completely in clean warm water.

6.8.2.4 Wipe the respirator lightly with disinfectant wipes (70% Isopropyl Alcohol) to kill germs, as needed.

6.8.2.5 Thoroughly air dry in a clean area.

6.8.2.6 Reassemble the respirator and replace any defective parts.

6.8.2.7 Place in a clean, dry plastic bag or other airtight container.

 6.8.3 Respirator Inspection & Maintenance

Respirators are to be visually inspected for worn or deteriorated parts, routinely cleaned, and properly maintained to ensure effective protection at all times. Worn or defective parts must be replaced prior to use. Replacement parts must be approved by the respirator manufacturer, to comply with the NIOSH approval number for the respirator.

6.8.3.1 Inspection Procedures

 Respirators are to be inspected before and after each use. The following checklist will be used when inspecting respirators:

* Facepiece: check for cracks, tears, holes, facemask distortion, cracked or loose lenses/faceshield, etc.
* Headstraps: breaks, tears or bent or broken buckles.
* Valves: residue or dirt, cracks or tears, valves stuck or folded open.
* Filters/Cartridges: NIOSH approval designation/label clearly visible, gaskets, cracks or dents in housing, proper cartridge for hazard.
* PAPRs: hose condition, gaskets, motor function, battery charge and condition.
* Air Supply Systems: breathing air quality/grade, condition of supply hoses, hose connections, settings on regulators and valves.

Respirator users are permitted to leave their work area to perform limited maintenance on their respirator. This should be in a designated area or an area that is free of respiratory hazards. Situations may include:

* Wash their face and/or face piece to prevent eye or skin irritation,
* To replace the filter cartridge or canister if vapor odors or chemical breakthrough or leakage is detected, or
* If any other damage to the respirator or its components is detected.

 6.8.4 Filter Cartridge Change Schedules

6.8.4.1 Particulate Filter Cartridges:

Respirator users wearing respirators with particulate filter cartridges (N-, P-, R-95, 99, 100) shall change the cartridges when they first begin to experience increased breathing resistance while wearing their masks, if interior cartridge is damaged or wetted, or at least monthly.

6.8.4.2 Organic Vapor/Chemical Cartridges:

Respirator users wearing respirators with organic vapor cartridges shall change the cartridges as soon as chemical odors can be detected while wearing the respirator, in accordance with manufacturer requirements, if cartridge is wetted or damaged, or according to a specific change schedule. Cartridges shall be properly stored.

 6.8.5 Respirator Storage

Respirators must be stored in a clean, dry area, and in accordance with the manufacturer's recommendations. Each respirator user will clean and inspect his/her respirator in accordance with the provisions of this program and will store his/her respirator in a clean plastic bag.

 6.8.6 Defective Respirators

Defective respirators or parts shall be taken out of service immediately. If, during an inspection, a respirator user discovers a defect, he/she is to notify their supervisor immediately. Supervisors will decide whether to:

* Temporarily take the respirator out of service until parts can be replaced, or the respirator repaired.
* Replace necessary parts, such as replacing a head strap.
* Dispose of the respirator due to an irreparable problem or defect, and replace with the same manufacturer, model and size.

When a respirator is taken out of service for an extended period of time, the respirator will be tagged out of service, and the respirator user will be given a replacement of the same make, model, and size.

SARs shall only be repaired by the manufacturer or an approved vendor.

**7.0 INFORMATION & TRAINING REQUIREMENTS**

7.1 **Minimum Respirator Training Requirements**

7.1.1 On-Line Training (Part I) – All Penn State authorized respirator users required to use respirators must enroll in, and successfully complete the on-line training program provided by Otis-Summit, through the EHS website. On completion, a certificate should be completed for subsequent records management.

7.1.2 Hands-On Training (Part II) – All Penn State authorized respirator users required to use respirators must also complete a hands-on training with the specific respirator(s) they will use in their work assignment. Such hands-on training will consist of:

* Component parts of the respirator, and how to assemble and re-assemble the respirator, as required for periodic cleaning and inspection,
* How to properly clean, maintain, and store the respirator,
* How to inspect for damaged or defective respirator components,
* How to properly donn and doff the respirator, and how to correctly perform positive and negative pressure seal checks,
* Use of correct manufacturer’s respirator cartridges, for the job applications (air-purifying respirators),
* Review end-of-service life for respirator cartridges to be used, and in coordination with unit safety officer,
* Notice that respirators must be properly cleaned, inspected and disinfected prior to any multi-person use,
* Review voluntary use requirements and OSHA respirator standard Appendix D, pertinent to voluntary use dust masks.

7.1.3 Specialized Training (provided by Respirator Manufacturer) shall be required for Supplied Air and Self-Contained Breathing Apparatus (SCBA) systems. Such training shall minimally address the requirements outlined in the OSHA respirator standard, presented at 29 CFR 1910.134 (k), and pertinent sections of (g) – (i), pertinent to SCBA and SA systems.

7.1.4 Annual Refresher Training – All persons required to use respiratory protection must take refresher training on an annual/ periodic basis. Such training is intended to ensure users remain proficient in the respiratory protection used, and relative to the hazards encountered.

7.2 Training Proficiency – Respirator users must be able to demonstrate proficiency in pertinent respirator use.

7.3 Training Documentation – Training documents and records shall be located within the applicable work unit, and/or the EHS department. Such records shall minimally include: copies or electronic access to training program, employee completed training certificates or course roster with training title, date, content aspects, duration, sponsor, instructors name/signature, and participant name/signatures.

**8.0 Program evaluation**

8.1 **Program Manager (PM)**

 The Program Manager (EHS) shall periodically review the overall program contents to ensure these contents are updated with respect to OSHA and pertinent regulations.

8.2 **Location/Work Unit Program Administrator (LPA)**

The Location/Work Unit Administrator (LPA) shall verify that pertinent persons are included within the RPP, that necessary risk/exposure assessments are conducted, and that the respiratory protection program content remains current. The LPA shall conduct other related activities associated with program evaluation including:

8.2.1 Conduct periodic evaluations or audits of the RPP in consultation with EHS, and/or with EHS assistance, as mutually determined. Evaluations may include: consultations with employees using respirators and their supervisors, site inspections, air monitoring, and review of records. Refer to Appendix E – Program Evaluation/Auditing Checklist for available criteria and forms.

8.2.2 The LPA shall periodically update location or work unit managers and provide recommendations to location managers and to EHS for improving the respiratory protection program, and/or to address program deficiencies. Identified deficiencies should be corrected with target dates for implementation.

8.3 **Supervisors and Respirator Users**

 Supervisors and respirator users shall be responsible to participate in program evaluations by providing information and assistance to the LPA.

8.4 **Local Budget Executives and Administrators**

 Location managers shall support program improvements to the extent feasible, and particularly where needed to overcome respiratory protection program deficiencies.

**9.0 documentation & recordkeeping**

9.1 **Record Maintenance**

 Medical, respirator fit test, training, and auditing records shall be maintained by the work unit, as determined by the LPA and location management.

9.2 **Records Retention**

 9.2.1 Medical Records – shall be maintained by Penn State Occupational Medicine and/or the designated campus or regional medical provider in accordance with Penn State medical retention requirements, and according to OSHA 29 CFR 1910.1020 requirements.

 9.2.2 Exposure Records – Exposure records shall be maintained by the pertinent location and by EHS, as necessary to support inquiry of current or recent past exposure levels and necessary controls. Exposure records shall be maintained or archived according to minimum requirements presented at 29 CFR 1910.1020.

 9.2.3 Training Records – Training documentation and records shall be maintained by the location for each person that remains in the respirator program. Training records should be archived upon employee leaving employment, retirement, or when the employee is no longer active in the respiratory protection program.

 9.2.4 Respirator Fit Test Records – Current fit test records shall be maintained for current employee participants, at least 1 year, then subsequently archived.

 9.2.5 Record Retention Maintenance – Records shall be maintained in accordance with current Penn State Record Retention policy.

 9.2.6 Records Inspection – All records must remain accessible for inspection at the request of OSHA or NIOSH according to requirements of 29 CFR 1910.1020.

**10.0 REFERENCES**

 The following general references are provided for user support.

10.1 U.S. Department of Labor/ Occupational Safety and Health Administration resource information available through OSHA website:

 10.1.1 Respiratory Protection eTool (guidance for respirator selection and filter change schedules)

 <https://www.osha.gov/SLTC/etools/respiratory/index.html>

 10.1.2 OSHA Safety and Health Topics – Respiratory Protection webpage:

 <https://www.osha.gov/SLTC/respiratoryprotection/index.html>

10.1.3 OSHA Website: *Respiratory Protection – Frequently Asked Questions*

 <https://www.osha.gov/dte/library/respirators/faq.html>

10.4 American Conference of Governmental Industrial Hygienists – Documentation of the Threshold Limit Values, or, Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices; 1330 Kemper Meadow Drive, Cincinnati, OH 45240-4148. Webpage: <http://www.acgih.org/forms/store/CommercePlusFormPublic/search?action=Feature>

10.5 National Institute of Occupational Safety and Health (NIOSH)

10.5.1 *Pocket Guide to Chemical Hazards* (online version):

 <http://www.cdc.gov/niosh/npg/npgsyn-a.html>

10.5.2 Other CDC/ NIOSH Publications available from search page:

  [http://www.cdc.gov/niosh/az/a.html](%20http%3A/www.cdc.gov/niosh/az/a.html)

10.6 American National Standards Institute (ANSI) – Various pertinent National Fire Protection Association (NFPA) standards regarding breathing air quality, and both ANSI/AIHA and ANSI/ASSE standards regarding respiratory protection standards:

 <http://webstore.ansi.org/FindStandards.aspx?SearchString=Respiratory+Protection&SearchOption=1&PageNum=0&SearchTermsArray=Respiratory+Protection|Respiratory+Protection|null>

**APPENDICES**

**A Approved Respirator Selection List**

**B Respirator User Selection Record (completed by location/ work unit)**

**C Respiratory Protection Planning and Fit-Testing Requirements**

**D EHS Respirator Fit Testing Form**

**E Program Evaluation/Auditing Checklist**

**APPENDIX A – Approved Respirator Selection List**

**Mine Safety Appliances (MSA)**

**1) Advantage 200 LS ½ Mask Air-Purifying Respirator**

**2) Advantage 3000 Full-Face Air-Purifying Respirator**

**3) MSA Millenium Full-Face Air-Purifying Respirator (Riot Protection Respirator)**

**3M Corporation**

**1) Series 6000 Air-Purifying Respirators (APR’s), ½ or Full-Face**

**2) Series FR-7800 APR’s, ½ or Full-Face**

**3) 3M Model 9211, 8511, N95 Filtering Facepiece (dust mask)**

**North (Honeywell)**

**1) Series 7700 ½ Mask Air-Purifying Respirator**

**Sperian**

**1) Saf-T-Fit Plus Model N1125, N95 Filtering Facepiece (dust mask)**

Other respirator types may be individually approved in communication with Penn State EHS. This list may be periodically edited or modified.

**APPENDIX B – Respirator User Selection Basis/ Record**

The following information is recorded to support location respiratory protection program recordkeeping. The LPA or Safety Officer should complete information with signature and date:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Ref.ID | Campus | College/ Department | Employee Name | Job Title | Critical Task (s) | Exposure Assessment? A | Method? B |
| 1 |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ref. ID | Medical Pre-Qual C | Pre-QualDate | Resp. Fit-TestProvider D | Resp. FitDate | Approved Resp. Type(s) E | ApprovedMfr. / Model/ Size(s) | Resp.Training? F | Date(s) | Voluntary Use Requested? | Vol. UseApprovedInitial | Vol. UseApprovedResp. Info |
| 1 |  |  |  |  |  |  |  |  |  |  |  |

The above employee is authorized to utilize the referenced-approved respirators, for the designated task operations. Periodic respirator training and fit-testing are required. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 **Name/ Signature LPA or SO Title Date**

**Table Notes**

A Exposure Assessment: (Y)- Yes (N)- No

B Method: (S)- Sampling (Q)- Qualitative estimate of exposure (describe): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

C, D Indicate Providers

E Respirator types:

 (FF)- Full face APR, (HF)- Half face APR, (DM) dust mask, (LF/PAPR)- Loose-fitting/ PAPR (hooded PAPR), (SA)- Supplied Air (HF, FF, or LF),

 SCBA- Self-contained breathing apparatus

 NOTE: Respirator fit test and training required annually.

F Respirator training conducted through EHS on-line web access (Part I). Part II (hands-on) training conducted by Unit Safety Officer or LPA. Consult EHS for assistance. Voluntary use typically include dust masks (filtering face-piece types), intended to provide “nuisance level” protection. LPA or Safety Officer must provide/review OSHA Respiratory Protection Standard, Appendix D information to approved, voluntary respirator users. Any other tight-fitting respirator types, require provision of medical clearance, fit-testing, and respirator training.

**APPENDIX C – Respiratory Protection Planning and Fit-Testing Requirements**

**Refer to subsequent page.**

**RESPIRATORY PROTECTION PLANNING & FIT-TESTING REQUIREMENTS**

The following planning steps shall be conducted and verified by the College/ Unit Safety Officer (SO), designated Campus Coordinator (CC), or assigned designee, in behalf of new respirator users.

1. Respirator use needs shall be confirmed in coordination with the SO, Supervisor, and EHS prior to respirator use planning. Contact EHS for assistance. Exposure sampling costs, as needed, will be paid for by the work unit.
2. Confirmed respirator users must register for and complete Penn State EHS on-line respiratory protection training, in coordination with EHS at [Respiratory Protection Basic Online Course.](https://apps.opp.psu.edu/ehs_training/course_list.cfm?page_action=ViewClasses&course=423) Contact EHS for assistance, or via email to thd12@psu.edu.
3. Confirmed respirator users must be medically-cleared, prior to respirator fit-testing.
4. Voluntary respirator use must be approved by the Supervisor, and in coordination with the SO. Voluntary users requesting filtering face-piece (dust masks) must be provided a review of OSHA Respirator Standard (29 CFR 1910.134) Appendix D only. Voluntary respirator use of other types of tight-fitting respirators, shall require medical clearance, training and proper fit testing. Loose-fitting types shall require proper training and a review of Appendix D.
5. The following hand-on training elements must be provided to respirator users, and affirmed by the SO, CC, or designee prior to assigned respirator use (except voluntary use dust masks). These elements are generally reviewed during fit testing; however, verification must be conducted by the work unit:

□ Review respirator components with emphasis on valves, face-piece, head straps, filter cartridges, and proper respirator assembly. Affirm user understanding to self-inspect for fatigued or worn parts prior to use, and to replace worn or damaged parts prior to re-use.

□ Review proper donning/doffing and how to conduct a positive- and negative-pressure seal check,

□ Review necessity for respirator cleaning with mild soap and water, drying, proper respirator storage/maintenance; respirators MAY NOT BE SHARED BY MULTIPLE USERS unless properly disinfected and approved for such use by the SO or CC,

□ Review necessity for observing respirator cartridge service life, and respirator change-out schedule in coordination with the SO, and with EHS,

□ Review limitations of air-purifying respirators (including dust masks),

□ Verify the employee has received a review of the above elements, and understands they must receive necessary training as arranged by their SO or CC, prior to use.

6. Successful fit test documentation will be maintained by OM (or campus regional providers per OM procedures), or by EHS. Written verification of successful respirator fit must be provided to the employee at the time of fit-testing, and to the designee of the responsible work unit, to include:

a. Respirator User Name/ ID,

b. Date of Fit-Test,

c. Respirator Manufacturer/Model(s)/Size(s) successfully fitted,

d. Due Date for subsequent annual medical review and fit-test.

7. EHS will request records/information as needed to corroborate active and inactive participants.

End of requirements.

**APPENDIX D – EHS Respirator Fit-Test Form**

**Refer to subsequent page.**

**EHS Respirator Fit Test Form**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Employee Name/ Signature Fit Test Date

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Campus/ College/ Department PSU ID No.

Approved Respirator Type Manufacturer Model Size

\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_

\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_

\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_

\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_

**Fit Test Protocol (check as appropriate)**

\_\_\_\_\_ Bitrex Pass/ Fail \_\_\_\_\_ Irritant Smoke Pass/ Fail

\_\_\_\_\_ Saccharin Pass/ Fail \_\_\_\_\_ Banana Oil (Isoamyl acetate) Pass/ Fail

\_\_\_\_\_ Quantitative Fit Test (TSI PortaCount Plus)

**OSHA Fit Test Protocol Results**

Check as passed, indicate fit factor, or attach fit QNFT record.

Pass Fail QNFT Result Overall Results

\_\_\_\_ \_\_\_\_ \_\_\_\_\_\_\_\_\_\_ Normal Breathing Pass \_\_\_\_\_\_\_\_\_

\_\_\_\_ \_\_\_\_ \_\_\_\_\_\_\_\_\_\_ Deep Breathing

\_\_\_\_ \_\_\_\_ \_\_\_\_\_\_\_\_\_\_ Head Side-to-Side

\_\_\_\_ \_\_\_\_ \_\_\_\_\_\_\_\_\_\_ Head Up and Down

\_\_\_\_ \_\_\_\_ \_\_\_\_\_\_\_\_\_\_ Talking (rainbow passage)

\_\_\_\_ \_\_\_\_ \_\_\_\_\_\_\_\_\_\_ Bend at Waist

\_\_\_\_ \_\_\_\_ \_\_\_\_\_\_\_\_\_\_ Normal Breathing

Conditions which may impact respirator use:

\_\_\_\_ Facial hair Employee is clean-shaven? Y N Employee must be clean-shaven for

\_\_\_\_ Facial scarring tight-fitting respirator fit test

\_\_\_\_ Corrective lenses, glasses

\_\_\_\_ Dentures, dental prosthetics

\_\_\_\_ Significant weight gain or loss

I hereby certify that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Employee) has been properly fit tested on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (date), and that the above information is correct and accurate.

Fit Test Administrator: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Name)

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Signature)

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Title)

**Rainbow Passage next page**

OSHA Respirator Standard/ Fit-Test – Rainbow Passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.

**APPENDIX E – Program Evaluation/ Auditing Checklists**

**Refer to subsequent page.**

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