



RESPIRATORY PROTECTION PROGRAM

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RESPIRATORY PROTECTION PROGRAM

I. Purpose

Towson University (TU) is dedicated to providing safe and healthful facilities for all employees and students and complying with Federal and State occupational health and safety standards. Administrators, faculty, staff and students share the responsibility to ensure protection against inhalation hazards through the correct use of respiratory protective devices. This policy is designed to identify procedures and designate responsibilities for the implementation of the University's ***Respiratory Protection Program*** as required by the Occupational Safety and Health Administration (OSHA) under Title 29, Code of Federal Regulations Part 1910.134 (See Appendix A). The ***Respiratory Protection Program*** addresses the use of respiratory protection as a method to protect University employees from exposures to airborne biological, chemical and physical agents to safe levels below regulatory exposure limits as well as from oxygen rich and deficient (<19.5% or >23.5% Oxygen) environments.

II. Policy

The Towson University Department of Environmental Health & Safety (EHS) shall establish procedures for the selection, use and care of respiratory protective devices. Respirators shall only be used to protect employees from inhalation hazards in the following circumstances: (1) When other options for hazard control are infeasible (i.e., engineering controls or substitution of less toxic materials); (2) While engineering controls are being installed or repaired; or (3) During emergencies. Wherever feasible, engineering controls and work practices will be used to maintain worker exposures below regulatory exposure limits and at a safe level. When respirators are to be used, all requirements contained within the TU ***Respiratory Protection Program*** shall be followed.

The ***Respiratory Protection Program*** shall be reviewed and evaluated for its effectiveness at least annually and updated as necessary to incorporate new or modified regulations and guidelines that affect the proper use of respiratory protective devices. For purposes of compliance with regulations, this policy and the ***Respiratory Protection Program***, a respirator shall be defined as any device worn to: (1) reduce or eliminate inhalation exposure to any hazardous biological, chemical or particulate material, or (2) supply breathing air to the wearer. This includes respirators used to protect employees in an emergency.

III. Responsibilities

A. Department of Environmental Health & Safety (EHS) shall:

1. Appoint a Respiratory Protection Program Administrator to direct the TU ***Respiratory Protection Program***;
2. Develop the TU ***Respiratory Protection Program*** with annual review and revisions as necessary;
3. Distribute the Program to each affected worksite;
4. Evaluate respiratory hazards in the workplace;

5. Provide guidance and training to the campus community regarding the need, selection, use, limitations, maintenance and storage of respirator equipment;
 6. Provide a respirator fit-testing program for respirator users;
 7. Maintain training and fit-testing records;
 8. Coordinate the University's respirator medical monitoring program with the contracted Medical Monitoring Facility (MMF);
 9. Assist with developing and implementing controls to reduce or eliminate the need for respiratory protection; and
 10. Act as an information resource for problems and questions related to respiratory protection.
- B. The Medical Monitoring Facility (MMF) that EHS contracts with to provide occupational medical monitoring shall:
1. Provide or direct all required or recommended medical examinations appropriate for evaluation of respirator users;
 2. Maintain medical records relating to consultations, examinations and medical surveillance as required by law;
 3. Provide certification that persons required to wear respirators are physically able to do so without adverse medical consequences; and,
 4. Periodically review the overall effectiveness of the **Respiratory Protection Program** pertaining to provision of medical services related to the proper use of respirators.
- C. Supervisors, Principle Investigators and Directors shall:
1. Know the hazards in their areas that require respiratory protection;
 2. Identify employees who may require respiratory protection equipment;
 3. Ensure that initial medical examinations, follow-up medical examinations, fit-testing and training as described in the **Respiratory Protection Program** are provided to employees required to wear respirators;
 4. Provide site-specific information in the **Respiratory Protection Program** detailing personnel, hazards and procedures;
 5. Ensure respiratory protection equipment is properly used, cleaned, stored and maintained;
 6. Maintain an inventory of spare parts, filters and new respirators as necessary to ensure employees access to properly functioning equipment;
 7. Ensure that defective respiratory protective equipment is removed from service immediately and not used until approved repairs are effected;
 8. Conduct periodic worksite audits of respiratory protection activities under their control;
 9. Allow employees to leave the respirator use area as necessary to prevent eye or skin irritation associated with respirator use;
 10. Ensure appropriately trained and equipped employees remain in communication with respirator users inside an IDLH atmosphere;

11. Notify Environmental Health & Safety of any problems with respirator use, or any changes in work processes that would impact airborne contaminant levels; and,
12. Notify EHS of any change in an employee's medical condition, work environment or workload that might impact the safe use of respiratory protective equipment.

D. Respirator Wearers shall:

1. Comply with all required components of the ***Respiratory Protection Program*** (medical surveillance, training & fit-testing) BEFORE using any respirator;
2. Use respiratory protection equipment as instructed and in accordance with all provisions of the ***Respiratory Protection Program***;
3. Properly store, clean, inspect and maintain all assigned respirator equipment;
4. Report any respirator deficiencies or malfunctions to a supervisor;
5. Use the correct type of respiratory protection for the hazard(s) involved;
6. Inform supervisors of new situations that may require a change in the use of respiratory protection equipment;
7. Inform supervisors of any change in medical condition that might affect the safe use of respiratory protective equipment; and
8. Immediately follow emergency procedures and leave the respirator use area if a respirator fails to provide proper protection.

IV. Information

Assistance will be provided by EHS to any Department requesting guidance, exposure monitoring, fit testing or training to satisfy implementation of this policy. Please contact EHS at (410) 296-7593 or via email at safety@towson.edu.

V. Selection of Respirators

Respirators will be selected on the basis of workplace hazard assessments, as well as guidance from 29CFR1910.134, the American National Standard (ANSI) ***Practices for Respiratory Protection Z88.2-1992***, the National Institute for Occupational Safety and Health (NIOSH) ***Guide to Industrial Respiratory Protection*** and the most current version of the NIOSH ***Pocket Guide to Chemical Hazards***. Final selection of any respiratory protection device must be made in consultation with EHS. Only NIOSH approved respirators will be used.

The use of required respiratory protection equipment at TU is strictly limited to employees who document the need to utilize such equipment, pass and maintain an appropriate medical evaluation, attend annual training and complete annual fit-testing (if required). These basic requirements are described below and elsewhere in this program.

Respirators are only to be used in situations where engineering controls are infeasible or during installation of such controls. EHS shall procure the appropriate respirators when such equipment is necessary to protect the health of the employee.

The supervisor is required to identify the respiratory hazard(s) in the workplace and have these hazards evaluated to determine appropriate respiratory protective equipment. EHS is responsible for evaluating respiratory hazards and recommending appropriate levels of respiratory protection. If the supervisor cannot identify the contaminant or if exposure levels are unknown, the exposure shall be considered Immediately Dangerous to Life and Health (IDLH). The supervisor shall

provide information as necessary to permit evaluation of hazards in the workplace that may affect respirator use.

The supervisor must initiate the Respirator User Hazard Assessment Form for each employee required to utilize respiratory protection. This form shall be forwarded to EHS for documentation of hazard evaluations and determination of appropriate level(s) of respiratory protective equipment. EHS will then forward the completed form to the Medical Monitoring Facility (MMF) to determine appropriate levels of medical surveillance for the identified tasks. Copies of the completed form will also be provided to the Supervisor and employee.

Respirators will be selected on the basis of the "worst case" anticipated health hazard considering the following:

- The nature of the respiratory hazard;
- The extent or concentration of the hazard;
- The Permissible Exposure Limit (PEL) and Immediately Dangerous to Life and Health (IDLH) levels for the hazard. In the absence of a PEL, other suitable exposure guidelines such as the ACGIH Threshold Limit Values (TLV) will be utilized;
- Work requirements and conditions;
- Characteristics and limitations of available respirators;
- Minimal equipment requirements established by regulation or policy;
- Potential for skin absorption or severe eye irritation; and
- Potential for oxygen deficiency or enrichment.

Air-purifying respirators shall not be used if:

- Atmospheres are oxygen-deficient (i.e., < 19.5% oxygen);
- Contaminant concentrations are considered Immediately Dangerous to Life and Health (IDLH);
- Contaminant concentrations are unknown; or
- In emergencies where the concentration and/or type of contaminant is unknown.

Only respirators that can provide protection in excess of the anticipated airborne concentration will be selected. (Anticipated airborne concentration = NOISH Protection Factor X PEL).

Selection criteria will be documented with the Respirator User Hazard Assessment Form. (Appendix B) It is typically necessary to perform exposure monitoring to evaluate the need for and type of respiratory protection appropriate for the task(s). EHS is responsible for final determination of employees respiratory protection needs. The MMF will must provide a respiratory protection medical certification for every employee required to wear a respirator and filed in the employees medical records.

Supervisors are required to have respirator selection criteria reassessed whenever circumstances change that may compel use of different levels of respiratory protection (e.g., introduction of new inhalation hazards or work practice modifications resulting in increased chemical exposures, etc.), or if the work environment places increased physical demands upon the employee. The supervisor will make documentation of these changes on the Respirator User Hazard Assessment Update Form. (Appendix C)

The following factors shall be taken into account by EHS when selecting the proper respirator:

- Characteristics of the Hazardous Operation or Process
- Nature of contaminant
- Concentration of contaminant
- Respirator Enclosure Design
- Location of Hazardous Area
- Physical Conditions in Work Environment
- Vision
- Communications

VI. *Voluntary Use of Disposable Filtering Facepiece (Dust Masks)*

The ***Respiratory Protection Program*** also covers employees who voluntarily use respiratory protective equipment. Voluntary use means that the employee wishes to use a respirator on the job even though the employer or regulation does not require it.

Filtering facepiece respirators (e.g., disposable dust masks) are often used to provide relief from nuisance levels of dusts and mists. They cannot be used for protection against fumes, vapors, gases, asbestos, sandblasting or paint sprays. If employees elect to voluntarily use disposable respirators, and if there are no identified inhalation hazards, disposable masks may be provided without medical certification or fit testing. Employees using these disposable masks must be provided the information contained in Appendix D. Supervisors are responsible for providing two copies of this appendix to affected employees. One copy must be signed and dated by the employee and supervisor and returned to EHS.

If the supervisor permits voluntary use of any other type of respiratory protective device, the following apply:

- The supervisor must complete the written Respirator User Hazard Assessment Form,
- The employee must receive medical clearance to use the respirator,
- The employee must receive training to understand that failure to properly clean, store and maintain the respirator may present a health hazard to the user. This training is required initially and may be satisfied by the user reading and signing the Voluntary Use of Respirator Fact Sheet contained in this Program as Appendix III, and
- Respirators fit-tests are not required.

If employees are ***required*** to wear any respirator, including filtering face piece models, they must comply with all portions of the ***Respiratory Protection Program*** including medical evaluations and annual training. Workers wearing disposable respirators as protection against bloodborne pathogens or etiologic agents (inhalation or mucous membrane contact) must be medically certified and trained. Disposable respirators with listed protection factors (e.g., N95 masks) must also be fit-tested at least annually.

VII. *Medical Evaluation*

Prior to respirator fit testing, workers must be medically certified to wear the specified respirator without adverse health consequences. Individuals not medically certified will not wear respirators. Certification of medical capability shall be provided by a physician or other licensed health care professional (PLHCP) at the MMF. Medical evaluations may be discontinued when the employee is no longer required to use a respirator.

Medical screening shall be conducted as follows:

1. All employees participating in the Respiratory Protection Medical Surveillance Program must have a current and accurate Respirator User Hazard Assessment Form on file with the EHS. Employees will be asked to verify the information contained in this form at prior to each examination. After the supervisor and EHS have completed the initial Respirator User Hazard Assessment Form, the supervisor shall contact EHS to schedule an appointment for the employee. Supervisors are responsible for assuring attendance. Fees for missed appointments will be assessed against affected departments.
2. If any of the inhalation hazard or work condition information contained in the form changes, the supervisor shall submit a Respirator User Hazard Assessment Form Update to EHS for review, action and transmittal to MMF. If substantial changes occur that may require additional medical evaluation, EHS will contact the supervisor to schedule the affected employee(s) for additional evaluation.
3. If an employee's medical certification is due for renewal, and there have been no changes affecting inhalation hazards or work conditions, the supervisor shall check the appropriate block in the Respirator User Hazard Assessment Form Update and forward it directly to EHS at least 30 days prior to the expiration date. The supervisor will be contacted by EHS to schedule the employee's re-evaluation.
4. The medical evaluation will be conducted using the questionnaire in Appendix E. The PLHCP will provide a copy of this questionnaire to all employees requiring medical evaluations.
5. The PLHCP will assist employees who are unable to read the questionnaire.
6. Medical evaluation parameters are determined by the PLHCP. Initial evaluations shall as a minimum include pulmonary function tests (FVC and FEV1) and completion of a medical history questionnaire. Subsequent medical evaluations and follow-up testing is determined by the PLHCP, the Respiratory Protection Standard or other substance-specific regulations detailing frequency of medical evaluations.
7. All employees will be granted the opportunity to speak with a physician about their medical evaluation, if they so request.
8. Employees, their supervisors and EHS will be provided a written pass/fail certification from the MMF stating parameters under which the individual is medically able to wear a respirator. Respirator approval certifications from the MMF will indicate an expiration date for the medical clearance.
9. After an employee has received clearance and begun to wear his or her respirator, additional medical evaluations will be required under the following circumstances:
 - a. Employee reports signs and/or symptoms related to their ability to use a respirator, such as shortness of breath, dizziness, chest pains or wheezing. The employee or supervisor should contact EHS immediately if this occurs.

- b. The PLHCP determines the employee needs to be reevaluated. The supervisor will be contacted by EHS to arrange scheduling.
 - c. Information from this program, including observations made during fit testing and program evaluation, indicates a need for reevaluation. The supervisor will be contacted by EHS if this occurs.
 - d. A change occurs in workplace conditions that may result in an increased physiological burden on the employee. The supervisor is responsible for notification as described in item #2, above.
10. The MMF shall assure confidentiality of all examinations and questionnaires and shall maintain records of all medical testing, medical history questionnaires and certifications of respirator use eligibility.

Any employee required for medical reasons to wear a positive pressure air-purifying respirator (e.g., PAPR) will be provided with such a device by the EHS.

VIII. Fit-Testing

The safe and effective use of respiratory protection equipment, especially negative pressure respirators, requires that the respirator be properly fitted to the employee. Poorly fitting respirators fail to provide the expected degree of protection. Additionally, no single model or size of respirator is capable of fitting all people. Several models may be needed to determine which provides an acceptable fit.

Prior to being issued a re-useable, tight-fitting respirator, the employee must successfully pass a fit-test for that specific brand, model and size of respirator. Fit testing is conducted by EHS.

An employee cannot be fit-tested nor wear a face-sealing respirator if there is any facial hair present between the skin and facemask-sealing surface. More than slight beard stubble at the sealing surface is considered excessive facial hair. Any other condition that interferes with the sealing surface of the face piece or interferes with the valve function shall be identified during fit testing and corrected.

Any employee who experiences difficulty breathing or exhibits severe psychological reaction during any phase of fit-testing shall be referred to the MMF by EHS to re-evaluate whether the employee is capable of wearing a respirator.

Fit testing shall be repeated at least annually or more frequently if any change occurs which may alter respirator fit. Such changes may include:

- Weight change of 20 pounds or more;
- Significant facial scarring in areas of the face seal;
- Significant dental changes (e.g., multiple extractions or new dentures);
- Reconstructive or cosmetic surgery in the head/face; or
- Any condition which may affect the face-respirator seal.

EHS shall maintain records of current fit-tests to assure testing currency. Supervisors are responsible for ensuring employees have been fit-tested within the past 12 months, and shall ensure that respirators are not issued to nor used by any employee who has not met this requirement.

A fit test shall be used to determine the ability of each individual respirator wearer to obtain a satisfactory fit with any air purifying or supplied-air respirator. Quantitative fit tests will be performed, if possible. Qualitative fit tests will be performed if testing equipment deficiencies preclude use of quantitative testing methods. Fit-testing methods shall conform to the minimum requirements as detailed in Appendix A of the OSHA Respiratory Protection Standard (29 CFR 1910.134). (Attached as Appendix F of this document.) Personnel must successfully pass the fit test before being issued a respirator, and at least annually thereafter.

A. Qualitative Fit Tests:

The worker is exposed to an atmosphere containing an irritating aerosol and then asked to perform several exercises to challenge the respirator fit. The wearer reports any noticeable irritation caused by mask leaks.

B. Quantitative Fit Test:

A PORTACOUNT PLUS is used to accurately measure respirator fit by comparing the dust concentration in the surrounding air with the dust concentration inside the respirator. The ratio of these concentrations is called the Fit Factor. A modified filter cartridge (or a modified respirator face piece) equipped with a sampling port is used to collect air from inside the respirator. With the sampler attached, the wearer is asked to perform several exercises to challenge the respirator fit. During these movements, any leakage is measured by the particle counting device. A computer stores the fit test data and a final fit test report is generated. For half-face or filtering face piece respirators, an acceptable fit test is a measured fit factor of at least 100. Full-face respirators must demonstrate an acceptable fit factor of at least 500.

Supervisors are responsible for ensuring employees are fit-tested at least once per year. If any conditions or circumstances are observed by the supervisor that may affect the fit of an employee's respirator, the supervisor shall ensure respirators are not worn unless fit testing is repeated.

Copies of fit-test reports (Example, Appendix G) will be given to the employee, forwarded to the Supervisor and maintained by EHS. Supervisors are to ensure that employees are provided the specific brand, model and size of respirator indicated in the fit-test report. Respirators shall not be used unless successful fit testing has been demonstrated.

IX. Training

All employees who will use a respirator will be required to complete the training program before initial use, and before their annual renewal date. Employees must pass a written examination with a score of $\geq 80\%$ and practical exercise demonstrating the proper donning and doffing of their respirator. Training program objectives will include specific procedures applicable to their work areas and assignments as contained in the written **Respiratory Protection Program**.

Each respirator wearer shall be given initial training covering the following topics:

- Contents of the OSHA Respiratory Protection Standard
- Respiratory Hazards and Health Effects
- How Respirators Work

- Engineering Controls vs. Respirator Use
- Medical Evaluation
- Respirator Selection Rationale
- Proper Use and Limitations of Respirators
- Fit Testing
- Respirator Donning/Doffing
- Fit Checks
- Maintenance, Cleaning and Storage

Training for use of self-contained breathing apparatus (SCBA) will be in addition to the training above and provided by a qualified off-campus-training provider and coordinated through EHS.

Annual re-training is required of all employees who wear respirators. Training will be scheduled and completed prior to their annual refresher due date. Training will occur prior to fit testing and achieving a passing score of $\geq 80\%$ on the training exam is a prerequisite for fit testing. Individuals who score $< 80\%$ on the training exam will not be fit tested until such time as they are able to achieve a passing score.

Re-training will be required before the annual refresher due date if:

- There are changes in the work area that impact respirator use (rendering previous training obsolete);
- The employee no longer has the skill and understanding to follow and use the respirator per previous training and terms of the **Respiratory Protection Program**; or
- Any other situations arise that cause the supervisor or program administrator to recommend the employee is retrained.

X. Respirator Cleaning, Storage, Inspection and Maintenance

Manufacturers recommended procedures are included with each new respirator. The following information is intended as a general guideline for appropriate cleaning, storage, inspection and maintenance practices and should not supercede manufacturer's recommended procedures.

A. Cleaning and Disinfecting:

Respirators should be cleaned and disinfected regularly. Respirators issued for the exclusive use of one worker may be cleaned as often as necessary. Shared respirators or emergency use respirators must be cleaned and disinfected after each use.

The following procedures are provided for employee's use when cleaning respirators. They are general in nature, and the employee as an alternative may use the cleaning recommendations provided by the manufacturer of the respirators provided such procedures are as effective as those listed below. Equivalent effectiveness simply means that the procedures used must ensure that the respirator is properly cleaned and disinfected in a manner that prevents damage to the respirator and does not cause harm to the user.

1. Procedures for Cleaning Respirators
 - a. Remove filters, cartridges or canisters. Disassemble face pieces by removing speaking diaphragms, demand and pressure- demand valve assemblies, hoses, or any components recommended by the manufacturer. Discard or repair any defective parts.
 - b. Wash components in warm (110 ° F maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. A stiff bristle (not wire) brush may be used to facilitate the removal of dirt.
 - c. Rinse components thoroughly in clean, warm (110 ° F maximum), preferably running water. Drain.
 - d. When the cleaner used does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following:
 - 1) Hypochlorite solution (50 ppm of chlorine) made by adding approximately one milliliter (one tablespoon) of laundry bleach ("Chlorox") to one gallon of warm (110 ° F maximum); or,
 - 2) Aqueous solution of iodine (50 ppm iodine) made by adding approximately 0.8 milliliters of tincture of iodine (6-8 grams ammonium and/or potassium iodide/100 cc of 45% alcohol) to one liter of warm (110 ° F maximum) water; or,
 - 3) Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
 - e. Rinse components thoroughly in clean, warm (110 ° F maximum), preferably running water. Drain. The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on face pieces may result in dermatitis (skin irritation). In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts if not completely removed.
 - f. Components should be hand-dried with a clean lint-free cloth or air-dried.
 - g. Reassemble face piece, replacing filters, cartridges, and canisters where necessary.
 - h. Test the respirator to ensure that all components work properly.

B. Storage:

When not in use, the respirator and cartridges should be kept in a sealed, airtight container (i.e., zip-lock storage bag) and stored in a clean, dry, moderate temperature and non-contaminated environment. It is especially important to keep gas and vapor cartridges in a sealed container so they do not passively adsorb gases and vapors from the storage area and thereby reduces the filter service life. Particulate filters should also be protected from dusts and dirt. Emergency use respirators should be stored in a sturdy clean compartment that is quickly accessible in the work area and clearly marked.

C. Inspection Procedures and Schedules:

Each respirator shall be inspected routinely before and after use. A respirator shall be inspected by the user immediately prior to each use to ensure that it is in proper working condition. After cleaning, each respirator shall be inspected to determine if it is properly functioning or if it needs repairs or replacement of parts.

Respirators stored for emergency or rescue use shall be inspected at least monthly and before and after each use. Monthly inspections must be documented and include the date of inspection, name or signature of inspector, inspection findings, required remedial action and a serial number identifying the respirator. SCBA cylinders for emergency use shall be maintained in a fully charged state and recharged when pressure falls to 90% of the manufacturers recommended pressure level. Inspections must include determination that the regulator and warning devices function properly.

Manufacturer recommendations shall be followed for equipment inspection, but should include at a minimum:

1. Inspection Checklist for Filtering Face piece Respirators:

- a. Holes in filter
- b. Elasticity of straps
- c. Deterioration of straps and metal nose clip

2. Inspection Checklist for Air-Purifying Respirators:

- a. Face piece:
 - ◆ Dirt
 - ◆ Cracks, tears, or holes
 - ◆ Distortion of face piece
 - ◆ Cracked, scratched, or loose fitting lenses
- b. Head straps:
 - ◆ Breaks or tears
 - ◆ Loss of elasticity
 - ◆ Broken buckles or attachments

- c. Inhalation and Exhalation Valves:
 - ◆ Dust particles, dirt, or detergent residue on valve and valve seat
 - ◆ Cracks, tears, or distortion in valve material
 - ◆ Missing or defective valve covers
 - d. Filter Elements:
 - ◆ Proper filter for the hazard
 - ◆ Approval designation
 - ◆ Missing or worn gaskets
 - ◆ Worn threads on filter and face piece
 - ◆ Cracks or dents in filter housing
 - ◆ Deterioration of canister harness
 - ◆ Service life indicator, or end of service date
 - ◆ Date filters installed
 - e. Breathing tube:
 - ◆ Cracks or holes
 - ◆ Missing or loose hose clamps
 - ◆ Broken or missing end connectors
3. Inspection Checklist for Atmosphere-Supplying Respirators:
- a. Face piece:
 - ◆ Dirt
 - ◆ Cracks, tears, or holes
 - ◆ Distortion of face piece
 - ◆ Cracked, scratched, or loose fitting lenses
 - b. Head straps:
 - ◆ Breaks or tears
 - ◆ Loss of elasticity
 - ◆ Broken buckles or attachments
 - c. Hood, Helmet, Blouse, or Full Suit:
 - ◆ Rips or torn seams
 - ◆ Headgear suspension
 - ◆ Cracks or breaks in face shield
 - ◆ Protective screens that are intact and fit correctly over face shields, hoods, or blouses

d. Air Supply Systems:

- ◆ Breathing air quality
- ◆ Breaks or kinks in air supply hoses and fittings
- ◆ Tightness of connections
- ◆ Settings of regulators and valves
- ◆ Adequate pressure and/or airflow
- ◆ Correct operations of air-purifying elements and alarm for carbon monoxide or high temperatures

D. Maintenance of Respirators

Respirators are to be properly maintained at all times to ensure that they function properly and adequately protect the employee. Maintenance involves a thorough visual inspection for cleanliness and defects. Worn or deteriorated parts will be replaced prior to use. No components are to be replaced or repairs made beyond those recommended by the manufacturer. All repairs or adjustments to regulators, reducing and admission valves, or alarms of atmosphere-supplying respirators will be conducted by the manufacturer. Consult the manufacturer or distributor for replacement parts and filters.

Compressed air cylinders must be tested and maintained as prescribed in Department of Transportation regulations 49CFR173 and 49CFR178. These regulations detail requirements for scheduled hydrostatic testing, maintenance, etc. Supervisors with compressed air respirator equipment must be thoroughly familiar with the requirements pertaining to their equipment, and shall ensure appropriate maintenance and service.

XI. Respirator Cartridge Change-Out Schedule

Air-purifying respirators function by removing contaminants from air before inhalation. Contaminants are removed by filtration (e.g., for asbestos, glass fiber), adsorption (e.g., for benzene, carbon tetrachloride), or by chemical reaction (e.g., for ammonia). Filters or cartridges designed for contaminant removal have limited effective service lives. The service life of a cartridge depends upon many factors, including environmental conditions, breathing rate, cartridge filtering capacity, and the amount of contaminants in the air. A safety factor should be applied to the service life estimate to assure that the change schedule is a conservative estimate.

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

<i>Contaminant</i>	<i>Filter Cartridge Change Schedule</i>
Formaldehyde	Every 3 hours or end of shift (whichever comes first)
HCL, SO ₂ , Chlorine	Maximum one shift (\leq 8 hrs)
Methylene Chloride	FORBIDDEN. Must use Supplied Air.
Organic Vapors (\leq 200ppm)	Maximum 8 hours use total
Emergency Use	Discard after each use.
HEPA Filters	Restricted breathing or visibly dirty, wet, or damaged.
Filtering Dust mask	Visibly dirty/contaminated

In addition to the above, respirator cartridges will be immediately changed if any of the following conditions exist:

- ◆ You sense the contaminated environment you are working in; or
- ◆ The cartridges become wet; or
- ◆ The cartridge is damaged, or
- ◆ It becomes hard to breathe.

XII. Supplied Air Respirator Requirements

Supply-air respirators pose additional hazards due to the need to assure provision of adequate air. The use, inspection and maintenance of supply air respirators require implementation of additional procedures.

A. Air Quality

Airline respirators and self-contained breathing apparatus (SCBA) must deliver an acceptable air quality to the user.

1. SCBA and other cylinder-supplied respirators:

Only Grade D breathing air shall be permitted for use in cylinders. The supervisor is required to document the acceptability of breathing air by obtaining a report of the air quality from the supplier and inserting it in Appendix II of this program. It is recommended that such documentation be obtained at least yearly from the supplier. If a new supplier is used, documentation must be obtained prior to use of the breathing air.

The supervisor is responsible for ensuring inspections are conducted and records are available for inspection. The supervisor shall include details of the inspection program (procedures, responsibilities, document locations) in Appendix I of this program.

2. Breathing air compressors:

Air compressors used to supply breathing air to respirators must be specifically approved for such use. They must be constructed and used so that:

- a. Contaminated air is not allowed into the air-supply system;

- b. Moisture content is minimized so that the dew point at one atmosphere pressure is 10°F below the ambient temperature;
- c. Suitable in-line air-purifying sorbent beds and filters are installed to ensure breathing air quality;
- d. Sorbent beds and filters are maintained and replaced per the manufacturer instructions. A tag indicating the most recent change date and the supervisors' signature shall be maintained at the compressor;
- e. Carbon monoxide concentrations must not exceed 10 parts per million;
- f. Oil-lubricated compressors have a high-temperature alarm; and
- g. Breathing airline couplings are incompatible with outlets for non-respirable gases in the workplace.

Breathing air with oxygen concentrations over 23.5% or liquid oxygen shall not be used without specific approval from the Respiratory Protection Program Administrator.

XIII. Special Situations

A. Facial Hair

All employees must be clean-shaven to remove facial hair that could interfere with the face to face piece seal area or function of the face piece whenever they wear a respirator. Employees who have a medical condition, which precludes their ability to be clean-shaven on the job, must consult with their supervisor and the Administrator. If necessary, the employee may be referred to the University's contracted MMF or the University Health Center for a medical evaluation of his condition as it regards shaving facial hair.

B. Corrective Lenses

Employees who require corrective lenses (e.g., glasses) must take special precautions to ensure that their eyeglass frames do not interfere with the respirator seal. Eyeglasses with temple bars will not be worn with full-face respirators including PAPR's and SCBA's. A spectacle kit recommended by the manufacturer of the employee's respirator will be provided by EHS to the employee at no charge. The employee is responsible for the procurement and installation of his prescription lenses in the respirator spectacle kit in accordance with the University's policy on employee safety glasses contained in the TU Personal Protective Equipment (PPE) Standard Operation Procedures.

The wearing of prescription eyeglasses with half face air purifying respirators (APR) will be done in such a manner as not to interfere with the seal of the face piece. If the employee is unable to wear his eyeglasses with a half face APR, a full face APR shall be worn with the proper spectacle kit installed.

Contact lenses may be worn with full-face respirators but will not be worn with half mask APR's.

XIV. Evaluation of Respirator Program Effectiveness

Periodic review of the effectiveness of the respirator program is essential. EHS will conduct periodic surveys to determine the effectiveness of the respirator program. This will include worksite inspections, interviews with respirator wearers, air monitoring, and review of records. Acceptance of respirators by users is especially important. Users will be consulted periodically about their acceptance of wearing respirators. This includes comfort, resistance to breathing, fatigue, interference with vision, interference with communications, restriction of movement, interference with job performance, and confidence in the effectiveness of the respirator to provide adequate protection.

The above information can serve as an indication of the degree of protection provided by respirators and the effectiveness of the respirator program. Action shall be taken to correct any deficiencies found in the program. The findings of the respirator program evaluation will be reported, and the report shall list plans to correct faults in the program and target dates for the implementation of the plans.

XV. Emergency Procedures

In the event of a respirator failure or malfunction, the employee should immediately leave the contaminated environment and move to an uncontaminated area before removing his respirator. Do not re-enter the contaminated environment until the source of the respirator malfunction has been identified and corrected.

Appendix A

Respirator User Initial Hazard Assessment Form

Respirator User Initial Hazard Assessment Form

Part 1 - (to be completed by the Supervisor)

Employee's Name: _____ Phone: _____

Supervisor's Name: _____ Phone: _____

Supervisor's Signature: _____ Date: _____

Department/Unit: _____

This form is used to provide information for employees who are required to be enrolled in the TU Respiratory Protection Program. Please answer the following questions completely.

1. Will this respirator be used for the following (Circle Yes or No):
- | | | | | | |
|----------------------------|-----|----|----------------------|-----|----|
| Emergency Response? | Yes | No | Firefighting? | Yes | No |
| In Oxygen-Deficient Areas? | Yes | | No Emergency Escape? | Yes | No |

2. How often is employee expected to wear respirator (check one block)?
- | | |
|---|---|
| <input type="checkbox"/> Escape Only | <input type="checkbox"/> 2-4 Hours per Day |
| <input type="checkbox"/> Less than 5 Hours per Week | <input type="checkbox"/> Over 4 Hours per Day |
| <input type="checkbox"/> Less than 2 Hours per Day | <input type="checkbox"/> Other: |

3. Indicate typical daily work by employee while wearing respirator:
- a. Hours performing light work: _____
(E.g., sitting while writing, light assembly work, standing while operating light machinery)
- b. Hours performing moderate work: _____
(E.g., sitting while drilling or nailing, driving a vehicle in urban traffic, transferring a moderate load)
- c. Hours performing heavy work: _____
(E.g., lifting heavy load, shoveling, standing while bricklaying, climbing stairs with a heavy load)

4. Describe work conducted by employee while wearing respirator:
- _____
- _____
- _____

5. Describe potentially hazardous conditions employee may be exposed to while using the respirator:
- _____
- _____
- _____

6. Describe protective clothing (other than respirator) that the employee will wear while using respirator:

7. Describe temperature and humidity condition extremes that this employee will experience while wearing respirator:

8. Describe any special or hazardous conditions that this employee may encounter when wearing the respirator (e.g., confined space access, hazardous materials incident response, rescue duties, use of heavy equipment, etc.):

9. Describe any responsibilities that this employee will have while wearing the respirator that may affect the safety and well being of others (e.g., rescue, security, etc.):

10. Indicate the type(s) of respirator you anticipate this employee to require:

- | | |
|---|---|
| <input type="checkbox"/> Disposable mask | <input type="checkbox"/> Tight-fitting PAPR |
| <input type="checkbox"/> Half-face APR | <input type="checkbox"/> Airline (compressed air) |
| <input type="checkbox"/> Full-face APR | <input type="checkbox"/> Airline (compressor) |
| <input type="checkbox"/> Loose-fitting PAPR | <input type="checkbox"/> SCBA |

11. If so equipped, indicate the type(s) of filters and pre-filters you anticipate are needed for this employee's respirator:

12. Is this employee expected to be facially clean-shaven when wearing the respirator? (Circle Yes or No):
Yes No

13. While wearing the respirator, will this employee be exposed to fumes, vapors or gases that are corrosive or irritating to the eyes? (Circle Yes or No):
Yes No

-
14. Indicate the type of corrective lens this employee will wear (if necessary) when using the respirator (check one box):
Spectacles Contact Lenses Not Required
-

Part 2 - (To be completed by EHS)

This section is to be completed by the Department of Environmental Health & Safety. Copies of the completed Initial Hazard Assessment Form will be forwarded to the employee, the employee's supervisor and EHS who will forward a copy to the University's Medical Monitoring facility.

EHS recommended type of respiratory protective equipment:

- | | |
|--|--|
| <input type="checkbox"/> Disposable mask | <input type="checkbox"/> Tight-fitting powered APR |
| <input type="checkbox"/> Half-face APR | <input type="checkbox"/> Airline (compressed air) |
| <input type="checkbox"/> Full-face APR | <input type="checkbox"/> Airline (compressor) |
| <input type="checkbox"/> Loose-fitting powered APR | <input type="checkbox"/> SCBA |

Special Conditions/Comments:

Industrial Hygienist Name: _____
Signature: _____

Date: _____

Appendix B

Respirator User Hazard Assessment Update Form

Respirator User Hazard Assessment Update Form

<i>Part 1 - (to be completed by the Supervisor)</i>
--

Employee's Name: _____ Phone: _____

Supervisor's Name: _____ Phone: _____

Supervisor's Signature: _____ Date: _____

Department/Unit: _____

This form is used to provide update information for employees currently enrolled in the Respiratory Protection Program. Please check the appropriate block(s) and process form as indicated:

- Employee's Medical clearance must be renewed. No changes have occurred that impact respirator use or physical working conditions. (Forward form to EHS for forwarding to the University's Medical Monitoring Facility [MMF].)
- Employee is exposed to inhalation hazards that have not previously been assessed. (Provide specific information in Part 2 of this form for new inhalation hazards, forward form to EHS.)
- Employee's physical working conditions while wearing respiratory protection have changed. (Provide specific information concerning changes in Part 1 of this form, forward form to EHS for forwarding to the University's MMF.)
- Employee's medical clearance must be renewed. Other changes have occurred that impact respirator use or working conditions. (Provide specific information concerning changes in Part 1 or Part 2 of this form, forward form to EHS.)
- Other changes have occurred that may impact the employee's use of respiratory protection. (Provide details regarding changes in Part 1 or Part 2 of this form, and/or describe changes in the space below, forward form to EHS.):

Respirator User Hazard Assessment Update Form (Part 1-A)

Employee's Name: _____

Only enter information below that has changed for this employee

1. Will this respirator be used for the following (circle yes or no):
- | | | | | | |
|----------------------------|-----|----|------------------|-----|----|
| Emergency Response? | Yes | No | Firefighting? | Yes | No |
| In Oxygen-Deficient Areas? | Yes | No | Emergency Escape | Yes | No |
-

2. How often is employee expected to wear respirator (check one block):
- | | | | |
|----------------------------|--------------------------|-------------------------|--------------------------|
| Escape Only | <input type="checkbox"/> | 2 - 4 Hours per Day | <input type="checkbox"/> |
| Less than 5 Hours per Week | <input type="checkbox"/> | Over 4 Hours per Day | <input type="checkbox"/> |
| Less than 2 House per Day | <input type="checkbox"/> | Other (describe below): | <input type="checkbox"/> |
-

3. Indicate typical daily work by employee while wearing respirator:
- a. Hours performing light work:
(E.g., sitting while writing, light assembly work, standing while operating light machinery) _____

 - b. Hours performing moderate work:
(E.g., sitting while drilling or nailing, driving a truck in urban traffic, transferring a moderate load) _____

 - c. Hours performing heavy work:
(E.g., lifting heavy load, shoveling, standing while bricklaying, climbing stairs with a heavy load) _____
-

4. Describe work conducted by employee while wearing respirator:
- _____
- _____
- _____
-

5. Describe protective clothing (other than respirator) that the employee will wear while using respirator:
- _____
- _____
- _____
-

6. Describe temperature and humidity condition extremes that this employee will experience while wearing respirator:
- _____
- _____
- _____

Respirator User Hazard Assessment Update Form (Part 1-B)

Employee's Name: _____

7. Describe any special or hazardous conditions that this employee may encounter when wearing the respirator (e.g., confined space access, hazardous materials incident response, rescue duties, use of heavy equipment, etc.):

8. Describe any responsibilities that this employee will have while wearing the respirator that may affect the safety and well being of others (e.g., rescue, security, etc.):

9. Indicate the type(s) of respirator you anticipate this employee to require:

- | | |
|---|---|
| <input type="checkbox"/> Disposable mask | <input type="checkbox"/> Tight-fitting PAPR |
| <input type="checkbox"/> Half-face APR | <input type="checkbox"/> Airline (compressed air) |
| <input type="checkbox"/> Full-face APR | <input type="checkbox"/> Airline (compressor) |
| <input type="checkbox"/> Loose-fitting PAPR | <input type="checkbox"/> SCBA |
-

10. If so equipped, indicate the type(s) of filters and pre-filters you anticipate are needed for this employee's respirator:

11. Is this employee expected to be facially clean-shaven when wearing the respirator? (Circle yes or no):

Yes No

12. While wearing the respirator, will this employee be exposed to fumes, vapors or gases that are corrosive or irritating to the eyes? (Circle yes or no):

Yes No

13. Indicate the type of corrective lens this employee will wear (if required) when using the respirator (check one box):

Spectacle Contact Lenses Not Required

Respirator User Hazard Assessment Update Form (Part 2)

Employee's Name: _____

The following information is to be provided for each ***new*** inhalation hazard (i.e., each hazardous substance) the employee is expected to encounter while wearing the respirator. Shaded sections are to be completed by EHS.

Inhalation hazard: _____

Describe activity causing this hazard: _____

Describe duration of exposure (hours per day, days per year, etc.): _____

A. Observed Employee Exposure Rate:

B. PEL/TLV or other Published Exposure Limit:

C. Method Utilized to Determine Employee Exposure:

Industrial Hygienist: _____

Date: _____

Signature: _____

Respirator User Hazard Assessment Update Form (Part 3)

This section is to be completed by EHS. Copies of the completed Hazard Assessment Form will be forwarded to the employee, the employee's supervisor and EHS who will forward a copy to the University's Medical Monitoring Facility.

Type of respiratory protective equipment approved:

Special Conditions/Comments:

Industrial Hygienist: _____

Date:

Signature: _____

Appendix C

Voluntary Use of Respirator Fact Sheet & Form

Voluntary Use of Respirator Fact Sheet

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

You should do the following:

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

Voluntary Use of Respirators

Policies and Procedures

- I. I understand I am using respiratory protection strictly on a voluntary basis.
- II. I understand the use of negative pressure respirators can pose certain hazards if not used in accordance with the manufactures instructions.
- III. I acknowledge that Towson University has a Written Respiratory Protection Program (WRP).
- IV. I further acknowledge I may obtain a copy of the WRP from the Department of Environmental Health and Safety or view this program on the Department's website.
- V. I acknowledge that I received a copy of the manufacturer's instructions on the use and limitations of the respirator for which I received.
- VI. I also acknowledge receiving a copy of Appendices D of the OSHA standard for respiratory protection 29CFR1910.134. I understand I have the opportunity to discuss any of these items with EHS.
- VII. I agree to follow the manufacturer's instructions and abide by TU policies for the use of respirators.
- VIII. ***I understand and expressly assume all the risks and dangers of voluntarily using a respirator, and I hereby release, waive, discharge, and covenant not to sue Towson University, the University System of Maryland, the State of Maryland, and their officers, agents, servants, and employees (collectively, the "Releasees") from all liability, claims, demands, actions, or causes of action whatsoever arising out of any damages, loss, or injury to me or to my property because of my use of the respirator given to me by Towson University. I also hereby release, waive, discharge and covenant not to sue the Releasees from any claims whatsoever on account of any first aid, treatment, or service rendered to me during my participation in the above activity. I hereby agree to indemnify and hold harmless the Releasees from any loss, liability, damage, or costs, including court costs and attorneys' fees, that they may incur due to my use of the respirator given to me by Towson University.***
- IX. I agree, for myself and my successors, that the above representations and agreements are contractually binding, and are not mere recitals. I agree that my failure or refusal to sign such agreements or releases shall in no way affect the validity of this Agreement, nor revoke or cancel any of the terms of this Agreement. I or any of my successors shall be liable for the expenses (including legal fees) incurred by the party or parties in defending against such claim or suit. This Agreement shall not be modified orally.

I have carefully read this form and fully understand its contents. I am aware that this is a release of liability, a waiver of claims, an agreement not to sue, an indemnity, and a contract between myself and Towson University and for the benefit of others described herein, I sign it of my own free will.

Signature of Employee: _____ Date: _____

Printed Name: _____ Respirator model: _____

Note: A signed copy must be submitted to the Department of Environmental Safety and Health.

Department of Environmental Health & Safety

Phone: (410) 296-7593

Fax: (410) 296-5076

Emergency: (410) 704-2133

Email: Safety@towson.edu

Website: <http://wwwnew.towson.edu/adminfinance/facilities/ehs>

Appendix D

OSHA Respiratory Protection Standard

Link:

Standard:

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=12716

Appendix A:

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9780

Appendix B-1:

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9781

Appendix B-2:

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9782

Appendix C:

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9783

Appendix D:

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9784