

Respiratory Protection Program

I. General Policy

Employees at Keene State College are entitled to a safe, healthful, and hazard free work environment. This goal pertains to the respiratory protection standard at 29 CFR 1910.134, which outlines safe work practices, training, education, and how to assist individuals and departments.

Keene State College has a voluntary use policy with respect to respiratory protection. This means there are no known job tasks where Permissible Exposure Limits are exceeded. The respirator is provided for the employee for their comfort. If an employee wishes to wear a respirator, he/she must complete the following steps: medical evaluation, training, fit-testing, cleaning, maintenance and proper storage of the respirator.

II: RESPONSIBILITIES

1.1 Environmental Health and Safety Department

- 1.1.1 Designates the Program Administrator to over see the Respiratory Program
- 1.1.2 Evaluates and approves all respiratory protection equipment before the purchase and issuance to individuals. Only National Institute of Occupational Safety and Health (NIOSH) and Mine Safety and Health Administration (MSHA) approved respirators will be used at Keene State College.
- 1.1.3 Evaluates the nature of and extent of any potential respiratory hazard to determine whether the nature of the hazard is that of oxygen deficiency or contaminated air.
- 1.1.4 Determines circumstances when respirators must be worn.
- 1.1.5 Oversees issue of respiratory equipment. Ensures appropriate respirator selection for the expected hazard.
- 1.1.6 Evaluates and maintains records of training in respirator use and wear. May conduct training as needed.
- 1.1.7 Assists department heads on respiratory protection issues as needed.
- 1.1.8 Conducts formal inspections of respirator use, maintenance and storage.
- 1.1.9 Provides Respirator Medical Evaluation Questionnaire to individuals needing a respirator Before Use.

- 1.1.10 Conducts preliminary screening of the Respirator Medical Evaluation Questionnaire and follow up processing by Occupational Health Physician.

2.1 Individual Supervisor

- 2.1.1 Ensures all individuals have proper protection before entering a hazardous environment. If assistance in selecting a respirator is needed, contact the EHS person.
- 2.1.2 Provides for adequate storage facilities for respirators.

3.1 Individual

- 3.1.1 Visually inspects respirator before wearing and will exchange it if damaged. Uses proper fit test techniques before and during use.
- 3.1.2 Cleans respirator after use. Replaces cartridges when contaminant can be detected through the filter or breathing is difficult because of a clogged filter.
- 3.1.3 Ensures tight seal on mask by maintaining clean-shaven appearance any morning that respirator is used. Mustaches are acceptable if fit test is successful.
- 3.1.4 Reports potentially hazards environments to supervisor or EHS coordinator.

4.0 Definitions. The following definitions are important terms used in the respiratory protection.

4.1 Air-purifying respirator means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

4.1.1 Atmosphere-supplying respirator means a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.

4.1.2 Canister or cartridge means a container with a filter, sorbent, or catalyst, or combination of these items, which removes specific contaminants from the air passed through the container.

- 4.1.3 Demand respirator** means an atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.
- 4.1.4 Emergency situation** means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that may or does result in an uncontrolled significant release of an airborne contaminant.
- 4.1.5 Employee exposure** means exposure to a concentration of an airborne contaminant that would occur if the employee were not using respiratory protection.
- 4.1.6 End-of-service-life indicator (ESLI)** means a system that warns the respirator user of the approach of the end of adequate respiratory protection, for example, that the sorbent is approaching saturation or is no longer effective.
- 4.1.7 Escape-only respirator** means a respirator intended to be used only for emergency exit.
- 4.1.8 Filter or air purifying element** means a component used in respirators to remove solid or liquid aerosols from the inspired air.
- 4.1.9 Filtering facepiece (dust mask)** means 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.
- 4.1.10 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.
- 4.1.11 Fit test** means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual. (See also Qualitative fit test QLFT and Quantitative fit test QNFT.)

- 4.1.12 Helmet** means a rigid respiratory inlet covering that also provides head protection against impact and penetration.
- 4.1.13 High efficiency particulate air (HEPA) filter** means a filter that is at least 99.97% efficient in removing monodisperse particles of 0.3 micrometers in diameter. The equivalent NIOSH 42 CFR 84 particulate filters are the N100, R100, and P100 filters.
- 4.1.14 Hood** means a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.
- 4.1.15 Immediately dangerous to life or health (IDLH)** means an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual's ability to escape from a dangerous atmosphere.
- 4.1.16 Interior structural firefighting** means the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage. (See 29 CFR 1910.155)
- 4.1.17 Loose-fitting facepiece** means a respiratory inlet covering that is designed to form a partial seal with the face.
- 4.1.18 Negative pressure respirator (tight fitting)** means a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.
- 4.1.19 Oxygen deficient atmosphere** means an atmosphere with an oxygen content below 19.5% by volume.
- 4.1.20 Physician or other licensed health care professional (PLHCP)** means an individual whose legally permitted scope of practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required by paragraph (e) of this section.

- 4.1.21 Positive pressure respirator** means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.
- 4.1.22 Powered air-purifying respirator (PAPR)** means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.
- 4.1.23 Pressure demand respirator** means a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.
- 4.1.24 Qualitative fit test (QLFT)** means a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.
- 4.1.25 Quantitative fit test (QNFT)** means an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.
- 4.1.26 Respiratory inlet covering** means that portion of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source, or both. It may be a facepiece, helmet, hood, suit, or a mouthpiece respirator with nose clamp.
- 4.1.27 Self-contained breathing apparatus (SCBA)** means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.
- 4.1.28 Service life** means the period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer.
- 4.1.29 Supplied-air respirator (SAR) or airline respirator** means an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.
- 4.1.30 Tight-fitting facepiece** means a respiratory inlet covering that forms a complete seal with the face.

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

Selection of Respirator

Even though Keene State College has a voluntary use policy, respirator selection will be based on the following:

- Effectiveness of the respirator against the substance of concern
- Estimated maximum concentration of the substance in the work area
- General environment
- Known limitations of the respiratory protective device
- Comfort and fit
- Worker acceptance

Selection of the proper respirator(s) to be used in any work area or operation at Keene State College is made after a determination has been made as to the real and or potential exposure of employees to harmful concentrations of contaminants in the workplace atmosphere.

Medical Evaluation

All individuals must be medically cleared before wearing a respirator in a contaminated environment. Each individual must notify their supervisor if wearing the respirator results in claustrophobia or shortness of breath. Upon accidental exposure to a contaminant while wearing a respirator the affected individual should report the incident to their supervisor. Prompt medical attention is urged.

Before the respirator is issued, each individual must have a medical evaluation performed by a Professional Licensed Health Care Provider (PLHCP) using the medical questionnaire. A follow-up medical evaluation will be conducted if an individual gives a positive response to any question among questions one (1) through eight (8) of the medical questionnaire. Follow-up medical evaluation will be conducted under the following conditions:

1. A change occurs in workplace conditions that may result in a substantial increase in the physiological burden placed on an individual
2. An individual reports medical symptoms that are related to their ability to use a respirator

3. The PLHCP, supervisor, or EHS Coordinator that an individual needs to be re-evaluation.
4. Observations made during respirator fit testing and program evaluation indicate a need for individual re-evaluation.

Information that is provided to the PLHCP will be the following:

1. Type of respirator
2. Weight of respirator
3. Duration and use of respirator
4. Expected physical work
5. Additional PPE (Personal Protective Equipment)
6. Temperature and humidity extremes
7. Copy of OSHA Standard 1910.134

In determining the employee's ability to use a respirator, the employer must:

- Obtain written recommendation from the PLHCP including
 - Any limitations
 - The need for follow-up medical evaluation
 - A statement that the PLHCP has provided the employee with a copy of the PLHCP's written recommendation

6.1 Fit Testing Procedures

Because of the variation in face size and shape, respirators must be custom fit to insure an adequate seal between the face and face piece. Fit testing procedures are designed to find a respirator size and style that provides maximum protection and comfort. Respirator fit testing is covered in detail here. If a full-face respirator or a supplied air respirator is required, the appropriate fitting procedures will be covered in detail at the time of issuance.

Keene State College shall supply respirators from a sufficient number of respirator models and sizes so that the respirator is acceptable to, and correctly fits, the users. Individuals shall be fit-tested with the same make, model, size, and style of respirator that will be used.

Before donning a respirator an inspection must be conducted to include the following:

- General construction of respirator (not dented, cracked)
- Condition of straps (not frayed, crack, still elastic)

- Condition of valves
- Filter and cartridges (intact, unbroken)
- Cleanliness or respirator
- Flexibility of valve disk (not brittle)

Once the respirator is on, a check is performed which includes:

- Chin strap/section properly placed
- Respirator position on nose
- Temple strap tension, straps untangled
- Fit across nose bridge
- Room for glasses or safety glasses
- Tendency to slip
- Effects of smiling, talking
- Respirator comfort

The individual will now wear the respirator for two to three minutes to get accustomed to the feel of the device.

Positive Pressure Test

The wearer can do this test alone in the field. Closing off the exhalation valve and exhaling gently into the face piece. The fit is considered satisfactory if a slight positive pressure can be maintained inside the face piece without any evidence of outward leakage.

For some respirators, this method requires that the wearer removes the exhalation valve cover and then carefully replaces it after the test. Removing and replacing the exhalation valve cover often disturbs the respirator fit even more than does the negative pressure test. Therefore, this test should be used sparingly if it requires removing and replacing a valve cover. The test is easy for respirators whose valve cover has a single small port that can be closed by the palm or a finger. The wearer should do this test just before entering any hazardous atmosphere.

The test:

Cover the exhalation valve and exhale gently into the face piece. Hold the positive pressure for 10 seconds.

Care must be taken so that the individual does not exhale so strongly to force the respirator away from their face. The individual must be careful not to push hard on the exhalation valve. This will also force the respirator away from the face. No air should pass out of the respirator.

If leakage has been detected, the individual should do one or all of the following:

- Adjust tension on temple strap
- Refit respirator
- Try different size respirator

This test should be repeated until a satisfactory seal has been achieved. If leakage persists, notify the EHS Coordinator.

Negative Pressure Test

This test is very much like the positive pressure test. It has the same advantages and limitations. The wearer should conduct this test before entering any toxic atmosphere. Covering it with a piece of paper or the palm of the hand so that air does not pass, close off the inlet of the canister, cartridge, or filter. Then gently inhale so that the face piece collapses slightly and hold the breath for ten seconds. If the face piece remains slightly collapsed and no inward leakage is detected, the respirator is probably tight enough. This test, of course, can be used only on respirators with tight fitting face pieces.

The Test:

Cover the 2 cartridges with the palms of the hand and inhale for 5-10seconds. The face piece should collapse slightly. If no air leakage between face and face piece has been detected, a proper fit has been obtained. If leakage has been detected, the individual should do one or all of the following:

- Adjust tension on temple straps
- Refit respirator
- Try different size respirator

This test should be repeated until a satisfactory seal has been achieved. If leakage persists, notify the EHS Coordinator.

Cleaning, Maintenance, and Storage (for Air-Purifying Respirators)

Routine maintenance is essential towards the Respiratory Protection Program. By properly cleaning, maintaining, and storage a respirator, it is effectiveness is assured and its life increased.

All respirators will be cleaned after each days use to prevent possible infection or contamination. If the respirator has not been used, it should be cleaned monthly. Cleaning procedures are as follows:

- Remove filters, cartridges and valve flaps
- Immerse face piece in warm water and soap/disinfectants
- **DO NOT USE ALCOHOL OR ANY ORGANIC SOLVENT!**
- Use a soft brush or cloth to remove dust, grease, paint
- Towel or air dry
- Gently wash valve flaps. Inspect flaps, replace if needed
- Reassemble
- Store respirator in re-seleable bag
- See Appendix B for **Cleaning Procedure**

NOTE: Manufacturer's instructions should always be followed.

Inspection of respiratory protective equipment is extremely important to a users health. Without regular inspection, users can not be sure that they are receiving appropriate protection from airborne hazards. Neglecting to regularly inspect a respirator may allow harmful contaminants to enter through defective or worn parts. As a designated respirator user, one must ensure that the OSHA inspection schedule is followed. The following list will help determine how often respirators used in the workplace must be inspected.

Once the respirator has been cleaned it should be checked for physical damage including:

- Brittle or frayed temple straps and elastic head band
- Excessive fraying or stretching around respirator edges
- Rubber valve flap frayed or inelastic
- Warped exhaust or intake valve
- Torn face piece
- Cracked cartridge
- Damaged filter
- Excessive odor around cartridge stripped cartridge grooves

Respirators must be properly stored to protect them from conditions that may negatively affect their protection capabilities. Dust, sunlight, extreme temperatures, moisture, chemicals, and physical damage can all contribute to the deterioration of the respirator. Issued respirators must be stored in a clean and safe environment to prevent contamination and damage which may compromise the protective effect of the respirator. They shall be stored in a manner that will protect against the following: contamination, dust, sunlight, extreme temperatures, excessive moisture and damaging chemicals. They must also be stored in a manner that will prevent deformation of the facepiece. Manufacturers recommend keeping the respirators in the zip-lock bag, which they are packaged in to prevent

contamination.

Some good ideas for storage places are the following:

- Designate one cabinet for respirator storage and do not stack any heavy
- Objects on top of them.
- Keep in zip-lock bags and hang them in employee lockers
- Place them in an hard rubber/plastic containers, which will not bend if
- Under heavy objects (ex. Tupperware or Rubbermaid)
- If kept in emergency response kit, place on top of other equipment while
- In zip-lock bag, or place them in individual hard plastic container.