

**RESPIRATORY PROTECTION –
USE AND MAINTENANCE OF AIR PURIFYING
HALF-MASK RESPIRATORS**

(For assistance, please contact EHS at (402) 472-4925, or visit our web site at <http://ehs.unl.edu>)

This SOP describes general use and maintenance of air purifying, half mask respirators. This SOP is not a substitute for respirator-specific information and instructions provided by the manufacturer.

As with other types of respiratory protection devices, use of this type of respirator is contingent upon medical qualification, fit-testing, and training. This type of respirator is appropriate only under certain use conditions. Therefore, changes in the job situation or nature or level of airborne contaminants necessitate a new assessment to assure that the protection provided by the respirator is sufficient to protect against over-exposure.

Limitations

Air purifying respirators do not supply oxygen. Therefore, they must not be used in atmospheres that are oxygen deficient, or immediately dangerous to life and health (IDLH). Half-mask respirators provide a lower level of protection than full-face, air-purifying and supplied air respirators. Typically, a half-mask respirator is appropriate when the concentration of atmospheric contaminants exceeds an exposure level, but is relatively low. They can not be used to protect against contaminant concentrations that exceed the established protection factor for this type of respirator; and will only provide protection if the correct type of filters and/or cartridge(s) is/are used for the contaminant(s) of concern. Half-mask respirators do not provide skin or eye protection. Therefore, they should not be used in atmospheres where contaminants may cause eye or skin irritation. All respirators must be used in accordance with the manufacturer's instructions and in compliance with the conditions of the respirator's NIOSH certification.

Cartridge and Filter Replacement

A half-mask respirator is effective only when the correct type and combination of cartridges and/or filters are used. Cartridges and filters must be specifically designed for use with the brand of mask being worn and in consideration of the type and nature of the airborne contaminants. Cartridges and filters have a limited service life. Some cartridges are equipped with an End-of-Service-Life (ESLI) indicator. Those that are not equipped with ESLIs must be changed in accordance with a change schedule.

EHS will determine and document an appropriate change-out schedule in consideration of the conditions documented in the Respiratory Protective Equipment Hazard Assessment including manufacturer's recommendation, OSHA requirements, specific workplace parameters (e.g., humidity, contaminant concentrations, etc.), etc. A copy of

the written change schedule will be provided to the employee and their supervisor. Employees must adhere to the established schedule and report to EHS if they experience breakthrough before the end of the predicted service life so that adjustments to the schedule can be made as necessary. Under no circumstances shall a user rely on breakthrough in lieu of the written change schedule..

Face to Respirator Seal

A half-mask respirator is effective only when a good face-to-respirator seal is maintained. Growth of facial hair, scars, and weight gain/loss are some of the factors that can affect the fit of the respirator. Respirator users must be clean-shaven in the areas where the facepiece meets the face. If a respirator user experiences a change in facial configuration that may affect the fit of the respirator, such as facial scarring or extreme weight gain/loss, they should report the situation to their supervisor and contact EHS for re-testing. (**Note:** Employees that are not clean-shaven at the time of respirator fit testing will not be fitted with a respirator.)

Standard eyeglasses may interfere with the mask-to-face seal. Respirator users who wear eyeglasses should be fit-tested while wearing their eyeglasses.

Equipment Inspection

Users must inspect their respirators prior to each use. Inspection must follow all manufacturer's recommendations and include but not limited to the following checks:

- The respirator is clean and ready for use.
- The proper cartridges and/or filters are in place, securely mounted, and are not at the end of their service life.
- There are no holes, punctures, or tears in the equipment and that the mask remains flexible.
- The valves are in place and properly seated.
- The straps are in good condition and elasticity has not been lost.

Donning the Equipment

Put on the mask *before* entering the hazardous environment or beginning a task that will generate an airborne hazard.

- Hold the mask so the narrow nose-cup points upward. Grasp both of the lower mask straps and hook them behind the neck. Place the top cradle straps on top of and behind the head.
- Adjust the mask and tighten the straps enough to assure a good seal to the face without significant discomfort.
- Perform a positive seal check by closing off the exhalation valve with the palm of the hand or a flat piece of paper and blowing gently into the respirator. The mask should lift or push away from the face before air comes out.
- Perform a negative seal check by sealing off the filters or cartridges as recommended in the instructions for the brand of respirator and inhaling gently. The mask should collapse slightly on the face without leakage of air into the facepiece.
- Make adjustments, as needed, to assure a good fit.

Working While Wearing the Equipment

Know the hazards of the airborne contaminants and the signs and symptoms of exposure. Discontinue work, leave the area, and notify your supervisor and EHS immediately if experiencing signs or symptoms of exposure. Seek medical attention, if necessary.

- While using particulate filters, if breathing becomes more difficult and the facepiece collapses slightly when inhaling, it is a sign that the cartridge/filter needs to be replaced. Leave the area and replace the filter/cartridge.
- Detection of chemical odors/taste is a sign that the protection provided by the respirator has been compromised. Stop working, leave the area, wash hands and face, and check the fit. If the fit is adequate, change the cartridges/filters. If the problem persists, stop work and do not resume until the problem has been identified and corrected. Report any breakthrough that occurs before the end of the required changeout period to EHS.
- If the respirator and/or face become dirty during use, exit the area, and wash the face and hands. Clean the respirator as directed by the manufacturer.

Cleaning the Respirator

Employers must provide supplies needed to properly clean and store respiratory protection equipment.

- Clean the respirator thoroughly at the end of the day. Replace cartridges as required. Do not share respirators with other workers.
- Thorough cleaning involves removing the cartridges and other attachments, and immersing the facepiece in warm soap and water. Scrub the equipment. Rinse with water. Use a compatible disinfectant in accordance with directions provided by both the respirator and disinfectant manufacturers. Let the mask air dry or dry with a clean, lint-free towel.
- When the respirator is clean and dry, reassemble the respirator and replace defective valves, straps, or other parts. Seal the mask in a bag or box.

Storage of the Respirator

Store respirator protection equipment in a designated location away from chemicals, dust, sunlight, or temperature extremes when not in use. Store in a manner that prevents damage and deformation of the face piece.

The information provided in this SOP supplements the UNL Respiratory Protection Program. Refer to the full program document for more information.

See also 2 videos provided by the US Department of Labor, Occupational Safety and Health Administration:

1. [The Difference Between Respirators and Surgical Masks](#)
2. [Respirator Safety, Donning \(Putting on\) and Doffing \(Taking off\) and User Seal Checks](#)