ENVIRONMENTAL HEALTH AND SAFETY
University of Nebraska-Lincoln

Safe Operating Procedure

(Revised 8/23)

RESPIRATORY PROTECTION – USE AND MAINTENANCE OF FILTERING FACEPIECE RESPIRATORS

Definition

A filtering facepiece means a NIOSH-certified, negative pressure, particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium. They differ from other respirators because the filtering media itself is the mask. Negative pressure means that the flow of air through the filter is achieved via inhalation. This type of respirator is commonly used for protection against bioaerosols and dusts.

Purpose

This SOP describes general use and maintenance of air purifying, filtering facepiece respirators. This SOP is not a substitute for information and instructions provided by the manufacturer.

General Considerations

As with other types of respiratory protection devices, required use of this type of respirator is contingent upon medical qualification, fit-testing, and training. Voluntary use of a filtering facepiece is not subject to medical qualification or fit-testing, and training is abbreviated to require only that users receive and read the EHS SOP, ***Respiratory Protection - Voluntary Use of Respiratory Protection Equipment*** (or 29 CFR 1910.134, Appendix D).

This type of respirator is appropriate only under certain use conditions. Therefore, changes in the work conditions, nature or level of airborne contaminants necessitate a new EHS assessment to assure that the protection provided by the respirator is sufficient to protect against over-exposure.

Types of Filtering Facepiece Respirators

There are several types of filtering facepiece respirators. The type of filtering facepiece respirator is distinguished with both a letter designation (N, R, P) indicating resistance to oil degradation and a filtering efficiency (95%, 99%, 100%).

The selection of N-, R-, and P-series filters depends on the presence or absence of oil particles, as follows:

- If no oil particles are present in the work environment, use a filter of any series (i.e., N-, R-, or P-series).
- If oil particles (e.g., lubricants, cutting fluids, glycerine, etc.) are present, use an R- or P-series filter.

Selection of filter efficiency (i.e., 95%, 99%, or 99.97%) depends on how much filter leakage can be accepted. Higher filter efficiency means lower filter leakage.

Limitations Applicable to All Filtering Facepiece Respirators

Filter facepiece respirators are not appropriate and cannot be used for gases and vapors, asbestos, arsenic, cadmium, lead, 4,4'-methylene dianiline (MDA) or abrasive blasting. N-series respirators may not be used in environments containing oil aerosols. R-series respirators may be used in atmospheres containing oil, but may not be used for more than 8-hours or one shift. P-series filters use in environments where oil aerosols are present are time-limited in accordance with the manufacturer's guidance and in consideration of hygiene, breathing resistance, and filter condition.

Filtering facepiece 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). Typically, a filtering facepiece respirator is appropriate when the concentration of atmospheric contaminants exceeds an exposure level, but is less than 10 times the permissible exposure limit. They cannot be used to protect against contaminant concentrations that exceed the established protection factor for this type of respirator; nor will they protect against contaminants other than particulates (i.e., vapors, gases). Filtering facepiece 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, including filtering facepieces, must be used in accordance with the manufacturer's instructions and in compliance with the conditions of the respirator's NIOSH certification.

Additional Information Regarding Respirators Used for Infection Control Purposes

It is important that healthcare workers understand the significant functional difference between surgical masks and surgical N-95 respirators. Surgical masks are not designed to prevent inhalation of airborne contaminants, and are not certified by NIOSH as respirators (although they are approved by FDA as a medical device). They are designed to trap large particulates (i.e., respiratory secretions) that are expelled by the wearer or as a physical barrier to protect against splashes of blood or bodily fluids.

A surgical N-95 respirator is certified by NIOSH as a respirator and approved by FDA as a medical device. These types of devices are designed to filter particulates (airborne bacteria and viruses) from the air and protect the wearer from exposure.

Limitation of Surgical N95 Respirators

- Surgical N95 respirators are subject to the fit testing provisions of UNL's Respiratory Protection Program. A surgical N95 respirator that has not been fitted properly may leave gaps between the respirator and face, thereby compromising the effectiveness of the device. Facial hair or unusual facial features make it difficult or impossible to achieve a proper fit.
- This type of device is disposable. It should not be reused, disinfected for reuse, shared with others, and should be changed with breathing resistance increases, or when the filtering media becomes wet from saliva or respiratory secretions.

Donning the Equipment

Employees are not permitted to wear tight-fitting respirators if they have any condition that prevents them from achieving a tight seal, including facial hair, facial scars or missing dentures. They are not permitted to wear headphones, jewelry or other articles that may interfere with face to facepiece seal. Glasses or goggles should be worn in a way that doesn't interfere with the seal.

Prior to donning the respirator, and *before* entering the hazardous environment or beginning a task that will generate an airborne hazard,

- Inspect the respirator to verify that it is not damaged, deformed, or soiled. The filter should be free of holes other than the punctures around staples. Enlarged holes resulting from ripped or torn filter material around staple punctures are considered damage. Do not use the respirator if damaged, deformed, or soiled.
- Do not alter, abuse or misuse the respirator.

- When donning the respirator, determine whether the straps hold the respirator tightly against the face, and if the metal nose clip (if applicable on the chosen model) is in place and functions properly. If not, discard the respirator.
- Conduct seal checks in accordance with the manufacturer's procedures each time the respirator is donned. Usually, the seal check involves placing both hands completely over the filtering facepiece, inhaling sharply and repositioning the respirator if air leaks are detected between the face and respirator. If a proper seal cannot be achieved, do not enter a contaminated area.
- Employees should leave a contaminated area if the respirator needs to be changed.

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 filtering facepiece respirators, if breathing becomes more difficult and the facepiece collapses slightly when inhaling, it is a sign that the respirator needs to be replaced. Leave the area and replace the respirator.

Cleaning the Respirator

Filtering facepiece respirators are designed to be disposable. Do not reuse.

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 facepiece.

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