

CONN-OSHA QUARTERLY

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An Overview of Respiratory Protection

By Marigrace Riley, Health Consultant

Many employees use respirators in different types of workplaces to protect against airborne chemical contaminants, airborne infectious agents, and insufficient oxygen environments. Respirators protect users by either filtering out contaminants from the air or by supplying clean air from another source. It's important to assess the respiratory hazards present in the workplace before choosing which type of respirator should be used. While respirators are not a substitute for effective engineering controls such as ventilation, they must be used when controls do not reduce or eliminate respiratory hazards.

Types of Respirators

There are different types of respirators that can be used depending on what the respiratory hazards are that workers will be exposed to. They are either "air purifying" or "atmosphere supplying".

Air Purifying Respirators

- Filtering facepiece respirators are tight-fitting, disposable half-facepiece respirators that filter out particles such as dusts, mists, and fumes. These include N95s which filter at least 95% of airborne particles.
- Elastomeric half-face and full-face respirators are tight-fitting air purifying respirators (APRs) that are reusable and are equipped with replaceable filters or cartridges. These types of respirators protect against airborne contaminants including particulates, vapors, and gases depending on the types of filters or cartridges they are equipped with.
- Tight-fitting and loose-fitting powered air-purifying respirators (PAPRs) use a battery-powered fan that draws air through filters or cartridges. They provide protection against airborne contaminants including particulates, vapors, and gases depending on the types of filters or cartridges they are equipped with.

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Credit: osha.gov

Atmosphere Supplying Respirators

- Supplied-air respirators (SARs) receive air through a hose that is connected to a separate source that supplies clean air.
- Self-Contained Breathing Apparatus (SCBA) contain their own breathing air supply and are used for entry and escape from atmospheres that are considered immediately dangerous to life and health (IDLH) or oxygen deficient.

OSHA's Respiratory Protection Standard

The purpose of OSHA's Respiratory Protection Standard ([29 CFR 1910.134](#)) is to protect workers from airborne chemical contaminants, infectious airborne diseases, and insufficient oxygen environments. Under the standard, OSHA requires the employer to establish a respiratory protection program when over-exposure to an airborne contaminant or to low oxygen levels can cause illness or injury that can't be prevented using adequate engineering and administrative controls. OSHA may also require the employer to establish a respiratory protection program while these engineering and administrative controls are being installed or maintained and repaired, or for emergencies.

A major requirement of the standard includes developing and implementing a written respiratory protection program for employees who are required to use respirators. A program administrator, who will administer and evaluate the program, must be designated within the written program. The program must include worksite-specific procedures including procedures for selecting respirators for use in the workplace.

The plan must include procedures for employee medical evaluation and fit testing. Employees who are required to wear respirators must be medically cleared to do so because wearing a respirator may place a burden on an employee's health. The medical evaluation must be provided prior to an employee being fit tested. This evaluation can be conducted by providing the employee with the medical questionnaire found in [Appendix C](#) of the Respiratory Protection standard. The employer must identify a physician or other licensed health care provider to review the completed questionnaires and who will make a medical determination as to whether an employee is medically able to wear a respirator.

Employees need to be fit tested prior to the use of tight-fitting respirators and at least annually thereafter. Fit testing is also required if a different make, model, style, or size is used or if a physical change such as weight loss affects the fit of the respirator. The purpose of fit testing is to ensure that the respirator forms a good seal on the user's face so that it provides the level of protection that it was designed to provide. There are two different types of fit testing, qualitative and quantitative. Qualitative fit testing uses a test agent such as irritant smoke, isoamyl acetate, or saccharin and relies on the wearer's response to that test agent while wearing the respirator. If the employee detects the test agent while wearing the respirator the fit test has failed. Quantitative fit testing measures the amount of leakage into a respirator. A sampling probe or other measuring device is used to measure aerosol concentrations outside and on the inside of the respirator facepiece.

The written respiratory protection program must include procedures for proper use of respirators in routine and reasonably foreseeable emergency situations as well as procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators. There should also be procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators.

The employer must also provide annual training for employees that are included in the respiratory protection program. Training must include information on the respiratory hazards to which they are potentially exposed during routine and emergency situations. Employees must also be trained in the proper use of respirators, including putting on and removing them, any limitations on their use, and maintenance including cleaning and storage.

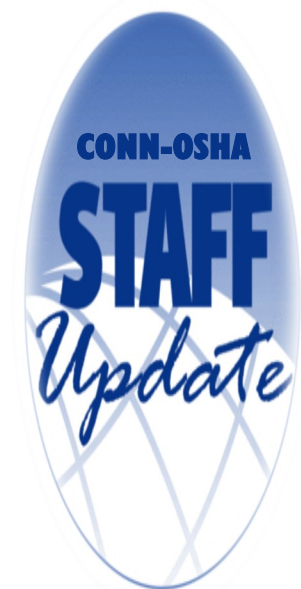
The plan must include procedures for regularly evaluating the effectiveness of the program. The employer must evaluate the program often enough to ensure that all elements of the respiratory protection program are being effectively implemented.

If an employer allows employees to wear a respirator on a voluntary basis, there are other requirements. If the respirator used is only a filtering facepiece, such as an N95, the employer must provide the employee with the information in [Appendix D](#) of the OSHA standard.

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If the employer allows voluntary use of any type of respirator other than a filtering facepiece, the employer must determine that the respirator itself does not create a hazard. The employer would also need to provide the employee with the information contained in Appendix D and establish and implement the elements of a written respiratory protection program necessary to ensure that the employee is medically able to use the respirator.

Several useful publications can be found on OSHA's website including the [Small Entity Compliance Guide for the Respiratory Protection Standard](#).



Requesting a Consultation

**To learn more or request your free consultation from CONN-OSHA:
Call us at 860-263-6900, or visit our [webpage](#)**

WORKERS HAVE RIGHTS!

The law says that employers cannot retaliate against workers for exercising their rights to a safe and healthful workplace under the Occupational Safety and Health Act. For example, workers have a lawful right to:

- Notify a supervisor or employer about a hazardous condition
- Report a workplace injury or illness
- Refuse to perform an extremely dangerous task where there is insufficient time to contact OSHA and the employee has requested and been unable to obtain abatement of the hazard
- Ask OSHA to inspect a workplace

If an employer has retaliated against you, *act quickly!* Workers must file a retaliation complaint with OSHA **within 30 days** after the alleged adverse action occurred or you became aware of it.

Public employees must file a retaliation complaint with the Connecticut Department of Labor **within 180 days** after the alleged adverse action. Visit CT DOL's [Whistleblower Protection Program webpage](#) for more info.

Welcome Benjamin Stephens

Ben joins our Compliance Division as an Occupational Hygienist. Before joining CONN-OSHA he worked for the Connecticut Department of Energy and Environmental Protection (DEEP). During his 12 years with DEEP he was employed by the Division of Emergency Response and Pollution Prevention where he worked as an emergency response coordinator and an environmental analyst.



Welcome Kim McLaughlin

Kim has joined CONN-OSHA's Administrative Team. Before joining our program, Kim had worked for the State of Connecticut for over 6 years. She was employed by the Department of Labor's Mediation and Arbitration Division as well as multiple departments at UCONN Health. Kim has been a volunteer EMT for over 15 years.



Save the
DATE

Virtual Training Schedule



OSHA Reporting and Recording Requirements

8/8/23

This workshop will introduce the requirements and procedures related to OSHA Injury & Illness Recordkeeping, including the electronic reporting of injuries and illnesses requirements. The class will help develop skills to accurately report occupational injuries and illnesses. If you are responsible for completing the documents required by this rule (OSHA 300, OSHA 300A and OSHA 301), or if you supervise the person that completes the forms, or if you are a safety committee member, this class is a must!

Chat with a CONN-OSHA Consultant: Respiratory Protection

9/26/23

During this session you will have the opportunity to hear from a CONN-OSHA Consultant. The focus topic will be on Respiratory Protection. Even though personal protective equipment should be used as a last resort for the protection of a worker, we do find ourselves having to utilize such protection. We will discuss the requirements of the OSHA Respiratory Protection standard, 29 CFR 1910.134, to help provide a better understanding. Feel free to bring questions for the Consultant!

Control of Hazardous Energy (LO/TO)

10/24/23

The OSHA standard for The Control of Hazardous Energy (Lockout/Tagout), 29 CFR 1910.147, addresses the practices and procedures necessary to disable machinery or equipment, thereby preventing the release of hazardous energy while employees perform servicing and maintenance activities. Employers are to develop, implement, and enforce an energy control program, and inspect the energy control procedures at least annually. The standard gives the employer flexibility to develop an energy control program suited to the needs of the particular workplace and the types of machines and equipment being maintained and serviced. If you are new to Lockout/Tagout this program will give you the basics you need to know. For those who are more familiar with the standard, this program will serve as a valuable review.

New England Roundtable

Every Wednesday of the Month

**** Sessions resume 9/6/23 ****

Bringing business together to network and share ideas in the occupational safety and health community. The roundtable meetings are held from 9:00 am to 10:15 am every Wednesday. For more information on the New England Roundtable visit: oshaedne.com/roundtables

[Visit this link for more info and to sign up.](#)

Fatality & Casualty Reporting

State & Town:

- Report to CONN-OSHA
- (860) 263-6946

Private Employers:

- Report to Federal OSHA
- (800) 321-OSHA (6742)

Hazard Corner: Fatalities When Air Line Respirators Are Inadvertently Hooked Up to Inert Gas Supplies.

If an inert gas (e.g., helium, argon, nitrogen) is inadvertently supplied to an air-line respirator rather than breathable air, the results can be fatal.

Air-line respirators are typically used in painting, cleaning, some manufacturing operations, and abrasive blasting. An air-line respirator, whether configured with a hood, helmet, coverall, or facepiece, must have a hose with terminal detachable couplings. Individuals responsible for the use of air-line respirators are urged to review their respiratory protection programs to ensure that the couplings of the respirator air lines are incompatible with any other fittings used at the worksite. When a respirator's air line is connected to a source of inert gas rather than to breathable air, the worker may have little warning before losing consciousness.

Case Study

An employee was using an air hammer to chip residue out of a furnace at an aluminum foundry. He was wearing an air-line respirator. Two compressed gas lines with universal access couplings were attached to a nearby post. The one on the right was labeled "natural gas." The gas line on the left had a paper tag attached with the word "air" handwritten on it; however, this line actually contained pure

nitrogen. A splitter diverted one part of the gas stream to the air hammer and the other part of the stream to the air-line respirator. The employee was asphyxiated and killed when exposed to pure nitrogen.

Conclusion

To help ensure that workers do not inadvertently hook up to inert gas supplies, the following recommendations should be implemented:

- Ensure that all requirements related to respiratory protection as outlined in 29 CFR 1910.134 are met. Written standard operating procedures governing the selection and use of respirators must be developed and implemented. Requirements for training and instruction in the proper use of respirators and their limitations must be met at all facilities.
- Ensure (determine) that the couplings of the respirator air lines are incompatible with any other couplings/fittings for non-respirable air or gas delivery systems. Replace couplings on non-breathing air systems with another, incompatible type of coupling.
- Ensure that breathable air systems are not in any way interconnected to nonbreathable air systems.
- Develop a maintenance procedure to address supply-line identification (labeling) and painting. Stress the purpose of color coding and the importance of completing detail painting in a timely fashion to ensure that this visual cue is always available to aid workers.

Reference: USDOL/OSHA Directorate of Science Technology and Medicine, Office of Science and Technology Assessment. SHIB 04-27-2004

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