RESPIRATORY PROTECTION

Approximately 5 million employees must wear respirators in over 1 million work areas around America. Respirators provide protection to employees who must labor in areas with insufficient oxygen and environments with hazardous dust, fog, smoke, mist, gases, vapors, aerosols, and sprays. These dangerous materials have been proven to cause cancer, impairment of lung function, numerous illnesses, or even death.

Companies that comply with the respiratory standards established by the Occupational Safety and Health Administration (OSHA) can avoid deaths by the hundreds and illnesses by the thousands every year. The following information provides references to health and safety resources which apply to protecting the respiratory system.

Construction, maritime, and general industries all have industry-specific standards for protection against respiratory hazards.

Links to these standards are provided here for your reference, as well as OSHA enforcement references such as preambles, directives, interpretations, federal registers, and letters of compliance. Some states have established more stringent standards and enforcement policies which have been approved by OSHA.

The latest revision of OSHA's Respiratory Protection Standard became effective April 8, 1998. This revision superseded the prior standards which were effective in 1971 (29 CFR 1910.134 and 1926.103).

The 1910.139 standard applied only to protection against mycobacterium tuberculosis and was withdrawn on December 31, 2003. Companies that had tuberculosis respiratory protection programs under 1910.139 had to modify their programs to ensure compliance with standard 29 CFR 1910.134 which became effective July 2, 2004.

RESPIRATORS

Remember that

- Respirators are designed for protective wear only when engineered controls are ineffective for hazard control OR until engineering controls are installed.
- This advisor does not modify or alter the requirements for respiratory protection established by 29 CFR.
- The United States Department of Labor does not endorse any products which are displayed or used as an illustration in this advisor and none is implied.

SCOPE AND APPLICATION – Who has to use respirators?

RESPIRATORY PROTECTION

The 29th Code of Federal Regulations (29 CFR), standard 1910.134, is applicable to any workplace airborne exposures. This includes employees who are
• Exposed to an airborne contaminant that has reached a dangerous concentration, or
• Employer-mandated to wear a respirator, or
• Authorized to wear respirators.

There are four primary responsibilities which are imposed by these standards. They are:
• Use engineered controls, rather than respirators, when practical to control dangers.
• Appropriate respirators must be provided.
• When respirators are provided, use is mandatory.
• A plan which ensures compliance with the standard's provisos must be instituted.

29 CFR 1910.134 – OSHA Respiratory Standard
PRIMARY REQUIRMENTS

The standard has protective requirements for General Industry (part 1910), Shipyards (part 1915), Marine Terminals (part 1917), Longshoremen (part 1918), and Construction (part 1926).

(a) Permissible Practice
• Paragraph (a) (1) outlines OSHA's preference for engineering controls to provide airborne contaminant control rather than individual respiratory protection. Individual respirators are only used if "effective engineering controls are not feasible, or while they are being instituted."
• Paragraph (a) (2) mandates that employers provide workers with "applicable and suitable" respirators in the event that "such equipment is necessary to protect the health of the employee."

(b) Definitions
Paragraph (b) defines the important terms that are used within the text of the standard.

(c) Respiratory Protection Program
• Mandates that a program administrator who is qualified to oversee the respiratory protection program must be designated.
• Employers must provide medical evaluations, training, and respirators free of charge to the employee.
• Contained within the Small Entity Compliance Guide is OSHA's criterion for selecting a program administrator and also a sample program as an example.

(d) Selection of Respirators
• Respirators must be certified and used in compliance with the conditions of certification by the National Institute for Occupational Safety and Health (NIOSH).

• Respiratory dangers must be identified and evaluated. A reasonable estimate of worker exposures must be included, and each contaminant's physical and chemical state must be identified.
• In the event that potential exposure can't be reasonably identified or estimated, the atmosphere will be considered to be IDLH – immediately dangerous to life or health.

• IDLH approved respirators –
- Must be NIOSH certified for at least 30 minutes of continuous use if the respirator is a full face, pressure demand, self-contained breathing apparatus (SCBA), OR

- Combine a full face, pressure demand, supplied-air respirator (SAR) and an auxiliary self-contained air supply.

- Any atmosphere that contains less than 19.5% oxygen will be considered to be IDLH with the following exception: If the company can demonstrate under all foreseeable conditions that workplace oxygen levels will remain within the ranges required by Table II, then "any atmosphere-supplying respirator may be used."
• Non-IDLH approved respirators –

In a gaseous or vaporous environment, the company must provide:
- A respirator that supplies atmosphere, or
- A respirator that purifies the air, provided that
1) The respirator has an end-of-service-life (ESLI) indicator which has been certified by NIOSH for the contaminant, or
2) If no ESLI is appropriate for the workplace conditions, the company must implement a change-out schedule for canisters or cartridges.

The schedule will assure that they are changed prior to the end of their service life. The schedule will also describe what information and data are relied upon for the change schedule basis.
For particulate protection, the company will provide:

- A respirator that supplies atmosphere, or
- A respirator that is an air purifier and is equipped with high efficiency particulate air (HEPA) filters that have been certified by NIOSH under 30 CFR, Part II or particulate filters that have been certified under 42 CFR, Part 84, or

- A respirator that is an air purifier and is equipped with any NIOSH certified particulate filter designed for particles which have a mass median aerodynamic diameter of 2 micrometers or larger.

(e) Medical Evaluation
- A medical evaluation must be provided by the company so that a worker's ability to use a respirator may be determined prior to pre-fit testing and use.

- A physician or other licensed health care professional (PLHCP) will be identified. He will perform a medical evaluation that utilizes the information required in Appendix C (medical questionnaire or an exam that obtains the questionnaire information).

- The PLHCP must provide a written recommendation that documents the worker's ability to properly use the respirator.
- The following circumstances require more medical evaluations
1) If a worker reports a medical condition or a symptom which inhibits his ability to use a respirator,
2) If a worker is recommended for reevaluation by the PLHCP, a program administrator, or his supervisor,
3) Observations noted during fit testing or evaluation of the program indicate a need.

4) A condition in the workplace changes and places an increased physiological load on the worker
5) A yearly review of a worker's medical status is not required.

(f) Fit Testing
• Every single worker who will be utilizing either a negative or a positive pressure tight fitting face piece respirator must first successfully complete an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT).

• Testing to assure fit will be accomplished before the initial respirator is used, if the respirator face piece is changed for a different one, and at least once per year after that.

If the worker reports a change in the worker's physical condition such as scarring of the face, changes in dental work, cosmetic surgery, or an obvious change in body weight, or if the company or PLHCP requires it, then another fit test must be accomplished to assure the respirator continues to fit properly.

• Under all circumstances, the fit test will be given using an OSHA-approved QLFT or QNFT protocol, as outlined in the mandatory Appendix A.
• QLFT Protocols
- Isoamyl acetate
- Saccharin
- Bitrex
- Irritant smoke

- QLFT will only be utilized to fit test air-purifying respirators (APRs) that are negative pressure and that have to reach a fit factor goal of 100 or less.
• QNFT Protocols:
- Generated Aerosol (corn oil, salt, DEHP)
- Condensation Nuclei Counter (Porta-Count)
- Controlled Negative Pressure (Dynatech FitTester 3000)
- Controlled Negative Pressure (CNP) REDON
- If the QNFT fit factor for a tight-fitting half face piece has been determined to be greater than or equal to 100, or for tight-fitting full face pieces is determined to be greater than or equal to 500, then the respirator has passed the QNFT.

(g) Use of Respirators

- Workers who have facial hair that interferes with the face-to-face piece seal or valve function, or any other condition which inhibits the seal, will not be allowed to wear a tight-fitting respirator.

- Any personal protective gear will be worn so that the seal of the face-to-face piece is not hindered in any fashion.

- Using the procedures which are outlined in mandatory Appendix B-1 or manufacturer's instructions which have been proven to be as effective as those in the Appendix, workers will perform a face-to-face piece seal check every single time the tight-fitting respirator is donned.

- Procedures that outline how to use a respirator in IDLH atmospheres have been previously outlined. In addition to the IDLH requirements, firefighting conducted on interior structural fires requires that SCBAs be used and also a protective procedure known to firefighters as "2 in, 2 out" be incorporated.

In "2 in, 2 out" procedures, a minimum of two firefighters should enter the structure and remain within eye or vocal contact with each other at all times.

A minimum of two firefighters must also be located outside of the structure. However, these precautions are not intended as a prohibition against firefighters performing any necessary emergency rescue activities prior to the assembly of the entire team.

(h) Maintenance and Care of Respirators
Respirators must be cleaned and disinfected utilizing either the procedures outlined in Appendix B-2 or manufacturer's instructions which have been proven to be as effective as those in the Appendix at the following intervals:

- As frequently as necessary to ensure that a sanitary condition is maintained for exclusive-use respirators.
- If respirators are shared by workers, then prior to use by any worker.
- After every single use for respirators designed for emergency use and for those respirators utilized during fit testing and training.

(i) Breathing Air Quality and Use
ANSI/CGA Commodity Specification for Air, G-7.1-1989 establishes the standards which must be met by compressed breathing air as required for Type 1, Grade D breathing air.

(j) Identification of Filters, Cartridges, and Canisters
• All filters, canisters, and cartridges that are utilized in the work area must be labeled and color-coded with a NIOSH approval label.
• Do not remove the label. Ensure it remains legible.

(k) Training and Information
• Effective training must be provided to respirator workers to include
- Why the respirator is necessary and how it can be rendered ineffective by improper fit, use, or poor maintenance.
- Respirator limits and capabilities
- Emergency situation use
- Procedures for inspecting, donning, removing, using, and seal check.
- Maintenance and storage procedures
- Medical signs and symptoms that could limit or prevent usefulness

- The standard's overall requirements
- Unless requisite training has been received by another employer within the last year, training must be completed prior to the initial use.

• Retraining is required once per year and also when
- Changes in workplace conditions are made
- New kinds of respirators are issued
- The worker demonstrates insufficient knowledge or use
• Advisory information contained in Appendix D will be given to workers who chose to wear respirators even when they are not required.

(l) Program Evaluation
The company must conduct workplace evaluations when necessary to be sure that the program is properly implemented and that workers are in compliance.

RESPIRATORY PROTECTION

(m) Recordkeeping

• Retention of medical evaluation records must be accomplished in accordance with 29 CFR 1910.1020.
• Fit test records must be maintained until the next fit test is accomplished.

Written Program

A respirator program must be written. Implementation of the program must be preplanned. Implementation includes selection, medical fitness, respirator maintenance, user training, fit testing, and evaluation of the program.

The intention of preplanning is to be sure that the worker safely uses the appropriate respirator. Program evaluation is designed to accommodate continuous improvements which are made to maintain an effective protective program.

Respirator Users

Nearly all of the respiratory protection program facets affect workers. Intimate knowledge of the principles behind respiratory protection is a key component of the program. Facets that have a direct worker impact are knowledge of selection criteria, medical examinations, plans for appropriate use, fit testing, and maintenance plans.

Careful selection and fit testing of tight fitting face pieces translates into adequate respirator protection. Medical examinations will determine if the worker is able to wear the respirator without adverse health consequences. Training reassures the worker that the respirator is being used in a safe, healthy manner.

Maintenance and Care of Respirators

A scheduled maintenance and cleaning schedule assures that respirators function appropriately and that they are not hazardous to workers.

Typically, an inspection of adequate function of the regulator should be accomplished prior to every use. Cleaning should be accomplished to prevent unsanitary conditions from occurring.

Fit Testing

Any respirator that depends upon a face-to-face piece seal should be checked yearly using either qualitative or quantitative methods to be sure that an good fit is maintained. A qualitative fit test administers a test agent to evoke a subjective sensation such as a taste, irritation, or smell.

RESPIRATORY PROTECTION

The quantitative fit test uses measuring devices to determine if the face seal leaks. The level of exposure in the work area determines if the fit is acceptable and whether a qualitative or quantitative test is required. For negative pressure respirators, workers MUST use a quantitative fit test for levels which are greater than 10 times the exposure limit. For exposure levels which are less than that, either method may be used.

Medical Requirements

Workers must be cleared by a medical professional prior to beginning use of a respirator. Respirators are typically burdensome on workers.

Breathing can be somewhat restricted on negative pressure respirators, some workers become claustrophobic while wearing a respirator, and self-contained breathing apparatuses are weighty. All of these conditions could affect the health of some workers who wear respirators. A medical professional can determine if there are special conditions under which certain employees may wear respirators.

THE
State Auto Group

Corporate Headquarters Address:
518 E. Broad Street, Columbus, Ohio 43215
Phone: (614) 464-5000