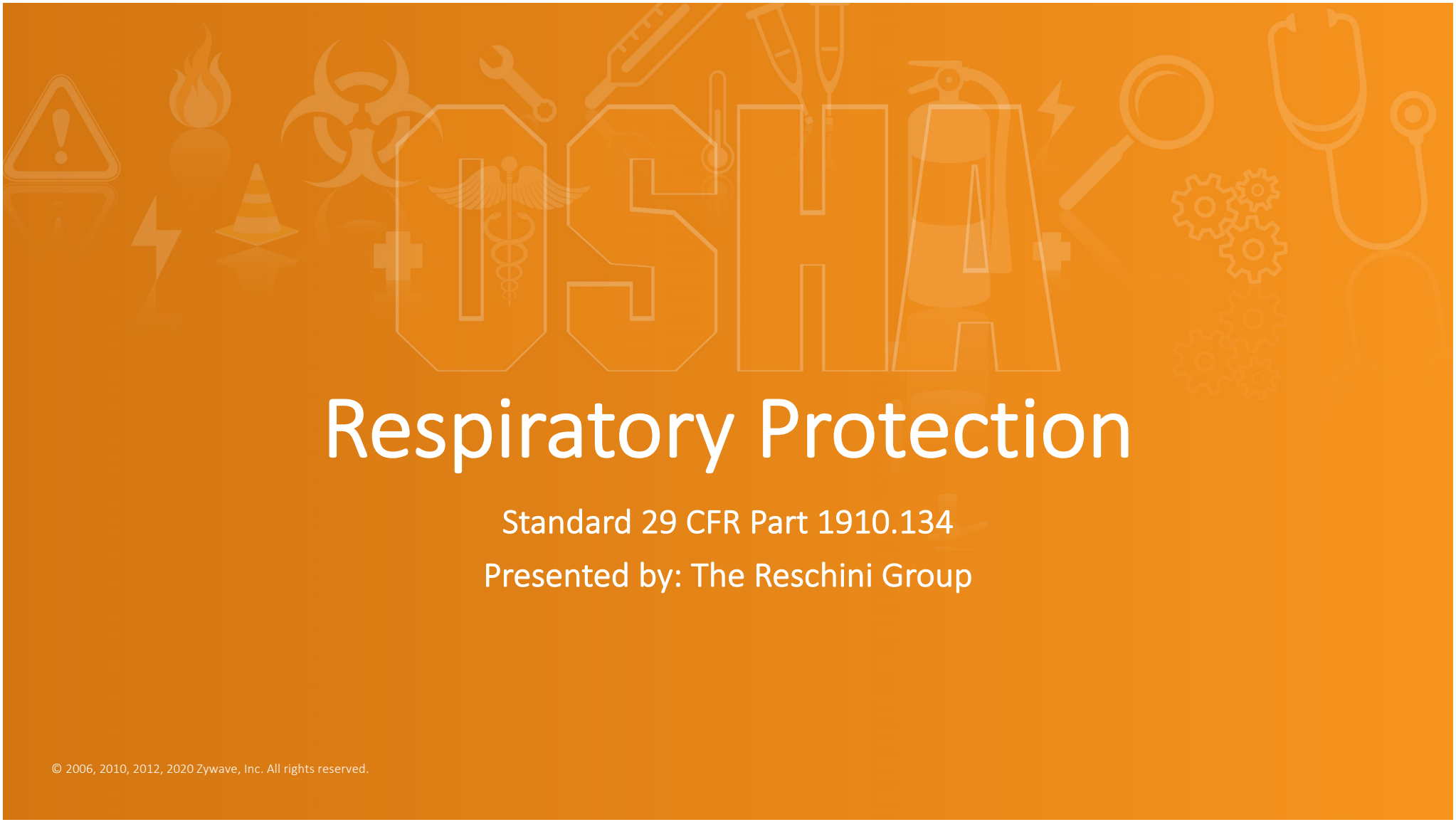


Respiratory Protection

Standard 29 CFR Part 1910.134

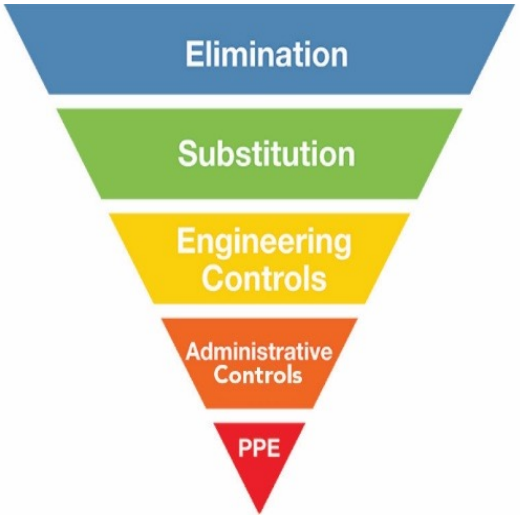
Presented by: The Reschini Group

Learning Objectives

- After this training program, participants will understand:
  - What the different types of respirators are
  - How respirators work
  - How to select the appropriate respirator
  - How to ensure an effective respirator fit
  - How to maintain a respirator

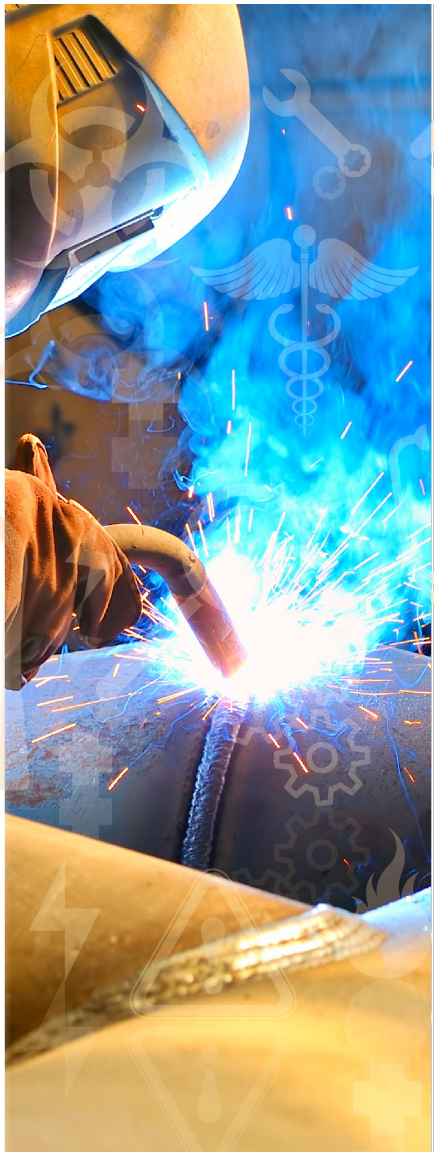
Hierarchy of Controls

- Particulates, dust, fumes, vapors and mists may be hazardous to an employee's health.
- The hierarchy of controls should be followed to reduce workplace risks. This can involve eliminating hazards, substituting substances for ones that are less hazardous or using engineering controls (e.g., increasing ventilation).
- Any respirators used must be appropriate for the task and worn correctly in order to be effective.
- Personal protection equipment (PPE), such as a respirator, is not the most effective hierarchy of control, as it must be appropriate for the task and worn correctly in order to effectively reduce risks.



Respiratory Protection: What Is It?

- Respirators are PPE that either supply air from a known, clean source, or purify the air surrounding the wearer.
- To ensure respirators are used effectively, a respiratory protection program must be in place. This program should account for:
  - Hazard evaluation
  - Training
  - Medical certification
  - Fit testing



Hazard Determination

- has evaluated the facility and determined where hazardous concentrations of chemicals may be present. We will discuss these areas now.
- periodically reevaluates contaminant concentrations to verify that our respiratory protection program is still adequate.

Types of Respirators - Atmosphere-supplying Respirators

- Atmosphere-supplying respirators supply breathing air directly to the user from a source other than the air surrounding the user.
- Common types of these respirators include self-contained breathing apparatuses (SCBAs) and airline respirators.
- Pros of atmosphere-supplying respirators:
  - They use an air supply that is known to be of good quality.
  - They can be used in higher concentrations of chemicals.
- Cons of atmosphere-supplying respirators:
  - They tend to be heavier.
  - They often have a limited air supply, particularly for SCBAs.
  - They are more complicated to use.

Types of Respirators – Air-purifying Respirators (APRs)

- Air-purifying respirators have filters, cartridges or canisters that remove contaminants from the air by passing the ambient air through the air-purifying element before it reaches the user.
- Common types of these respirators include cartridge respirators, N95 respirators and powered air purifying respirators (PAPRs).
- Pros of APRs:
  - They are simpler to use than atmosphere-supplying respirators.
  - They are lighter than atmosphere-supplying respirators.
- Cons of APRs:
  - They require the right cartridge for the hazard.
  - They have a lower protection factor.

How APRs Work

- APRs clean and/or filter the air in the work area—they do not supply any air or oxygen. Never use APRs in a fire, an oxygen-deficient atmosphere, or areas of unknown contaminants or concentrations.
- APRs either use a chemical “sorbent” to remove contaminants from the air, or they mechanically filter contaminants from the air.
- When you breathe in, the contaminated air is cleaned by the canister, cartridge or filter. The clean air then enters your lungs.
- APRs require a tight face-to-facepiece seal in order to provide protection. Failure to create a proper seal will result in contamination.

APR Protection

- APRs will protect you from these known chemical forms, specifically when the concentration is known and is within the capability of the respirator:
  - Dust (e.g., wood or metal)
  - Chemical vapor (e.g., solvent vapor)
  - Metal fume (e.g., welding or torching metals)
  - Mist (e.g., droplets of liquid in air)
- With APRs, the filter you use must be appropriate for the hazard. Many manufacturers will color code their cartridges to denote what vapors the respirator protects against. Choosing the incorrect filter may put you in danger.

Color Coding for 3M™ Chemical Cartridges		
6001	Organic Vapor	Black
6002	Acid Gases	White
6003	Organic Vapor/Acid Gases	Yellow
6004	Ammonia/Methylamine	Green
6005	Formaldehyde/Organic Vapor	Olive/Black
6006	Multi-Gas/Vapor	Olive
6009	Mercury Vapor/Chlorine Gas	Orange

Cartridge, Canister and Filter Replacement

- Always follow the schedule and procedure for replacing the cartridges, canisters and filters of your respirator. You may replace the entire respirator if it's disposable.
- If you ever smell or taste the chemical you are using the respirator to protect against, either the respirator is not fitted properly or the cartridge, canister or filter must be replaced.
- If the respirator becomes difficult to breathe through, it may be necessary to change respirators.
- If the canister or cartridge is equipped with an end of service life indicator (ESLI), make note of it.

Medical Requirements

- Respirators can place a burden on the body and cause physical harm to some people.
- Prior to being assigned to a job were you are required to use a respirator, you must be medically certified through a special questionnaire and/or through a medical evaluation that's provided at no cost to you.
- Periodic medical reevaluations will be required. A health care provider will decide what schedule is appropriate.
- Do not use a respirator until you are cleared by a health care provider.

Fit Testing

- Fit testing is required before wearing a respirator, both when you first wear one and on an annual basis.
- Fit testing is critical for knowing that:
  1. You have the correct size respirator.
  2. You are able to put the respirator on correctly to achieve a good fit.
- You shouldn't have any facial hair during fit testing to ensure the respirator seals to the face. **You are not allowed to have any facial hair or facial characteristic that interferes with the sealing surface of the respirator.**

Fit Testing (Continued)

- There are two types of fit testing—quantitative and qualitative.
- **Quantitative fit testing:**
  - Uses a machine to measure the actual amount of leakage into the facepiece and does not rely upon your sense of taste, smell or irritation in order to detect leakage
  - Requires special equipment, making it less common
- **Qualitative fit testing:**
  - Uses a pass/fail test method that leverages your sense of taste or smell, or your reaction to an irritant to detect leakage into the respirator facepiece
  - Relies on the wearer to be truthful and accurate

User Seal Checks

- While fit tests are done annually, you should perform a user seal check every time you put on a respirator. There are two main types of user seal checks—positive pressure and negative pressure seal checks.
- To perform a positive pressure seal check:
  - Place your hand over the exhalation valve and exhale gently.
  - Ensure that the facepiece bulges, but does not leak air between the face and respirator.
- To perform a negative pressure seal check:
  - Place your hands over the filters and inhale gently.
  - Check that, after stopping inhalation, the respirator remains sucked into the face.

Additional User Requirements

- Always inspect respirators before each use. Do not use the respirator if parts are missing or if the unit is damaged.
- Always double-check to ensure that the correct cartridge, canister or filter is in place, and that it has not exceeded its lifespan.
- Clean or discard the respirator according to manufacturer instructions.

Additional User Requirements (Continued)

- Always store the respirator in a clean and secure location away from the contaminants and **never** in the work area.
- Do not lend your respirator to others.
- All users must be trained and authorized in order to use respirators.
- Clean and sanitize respirators between uses.

Summary

- To wear a respirator you must be:
  - Medically certified
  - Fit tested
  - Trained
  - Free of facial hair and/or facial characteristics that could interfere with the seal of the facepiece
- Only use your respirator to protect against contaminants in known concentration. Never use it in a fire, in an oxygen-deficient atmosphere, or in areas of unknown contaminants or concentrations.
- Only wear the brand, model and size of respirator that you were fit tested for.
- Always wear the respirator when and where it is required.

For More Information

For more information regarding respiratory protection or other safety issues, please contact:

The Reschini Group

http://www.reschini.com

724.349.1300