ENVIRONMENTAL HEALTH AND SAFETY

Respiratory Protection Program

29CFR1910.134

Program Objectives

OSHA requires employers to establish and implement procedures for the proper use of respirators by doing the following:

- ☑Verify the need for respiratory protection
- ☑ Identify the proper respiratory protection
- ☑ Familiarize employees on how to properly use equipment

OSHA®

Elements in a Respiratory Protection Program

- ☑ Respirators are selected on basis of hazards
- ☑ Respirator care
- ☑ Appropriate surveillance of work area/monitoring
- ☑ Program evaluation (yearly)
- ☑ Medical evaluation and approval
- ☑ Approved respirator

General Aspects of Respiratory Protection

Respirator Qualification

- Employee must be trained
- Prior medical evaluation and approval
- No facial hair to interfere with seal
- Must pass fit test

General Aspects of Respiratory Protection

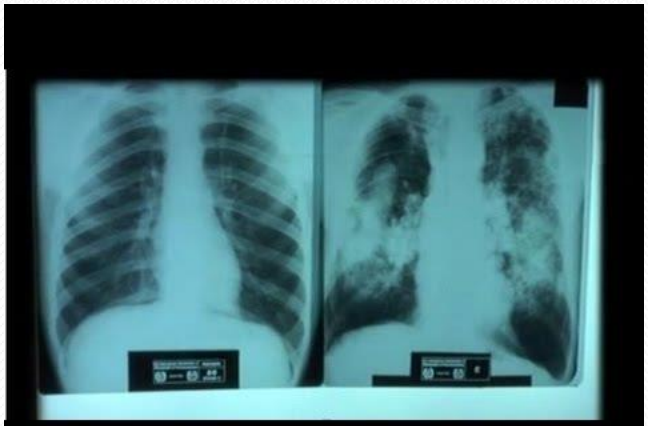
It is important to know why respirators are necessary

and

how improper fit, use, or selection can effect the purpose of the respirator.

Applicability

- OSHA sets enforceable permissible exposure limits (PELs) to protect workers against the health effects of exposure to hazardous substances
- PELs are regulatory limits on the amount or concentration of a substance in the air
- They may also contain a skin designation
- OSHA PELs are based on an 8-hour time weighted average (TWA) exposure

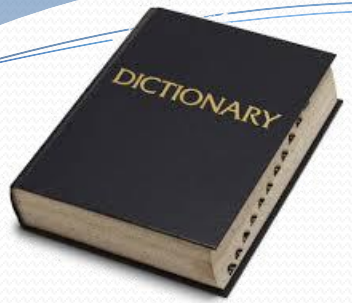


Exposure to silica dust over time:

Applicability

- Respirator use required if PEL exceeded
- If employer requires respirator use below PEL
- Voluntary use below PEL

TABLE Z-1. - LIMITS FOR AIR CONTAMINANTS				
Substance	CAS No.	PPM	Mg/m3	Skin Designation
Acetaldehyde	75-07-0	200	360	
Acetic acid	64-19-7	10	25	
Acetic anhydride	108-24-7	5	20	
Acetone	67-64-1	1000	2400	
Acetonitrile	75-05-8	40	70	
1,1,2-Trichloroethane	79-00-5	10	45	x



Definitions

- High efficiency particulate air (HEPA) filter
- Immediately dangerous to life of health (IDLH)
- Negative pressure respirator
- Oxygen deficient atmosphere
- Positive pressure respirator
- Powered air-purifying respirator
- Self-contained breathing apparatus (SCBA)
- Supplied-air respirator (SAR)

Limitations and Capabilities

- Oxygen level in atmosphere must be between 19.5% and 21%

- Will only work with corresponding filters or cartridges
- Can protect you from hazardous levels of materials
- If worn properly and in the right atmosphere, respirators can save your life

Written Program

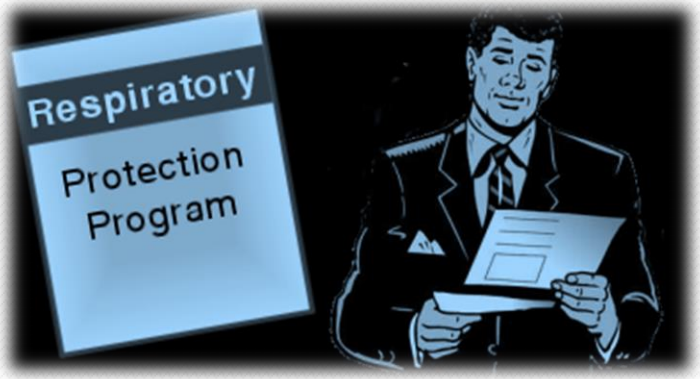
- Procedures for selecting respirators
- Medical evaluation
- Fit testing procedures
- Procedures for use of respirators
- Procedures and schedules for respirator maintenance (cleaning, disinfecting, storing, inspecting, repairing, and discarding)
- Training employees on respiratory hazards, proper use, limitations and maintenance
- Procedures for evaluating program effectiveness

Training

- ***Training is required:***
  - prior to initial use
  - annually
  - changes in workplace or respirator type

- ***Employee must be able to demonstrate knowledge:***
  - why respirator is necessary
  - limitations and capabilities of respirator

- How to use the respirator properly
- How to inspect, put on, use, check seal
- Respirator maintenance and storage
- Medical signs and symptoms that may limit the use of a respirator
- General requirement of 1910.134
- Voluntary use - train on Appendix D
- Without training injuries can occur



When Do We Use A Respirator?

- When engineering or administrative controls cannot control exposure
- Engineering controls fail
- Short term exposures, non routine situations,
  i.e., chemical mixing, maintenance
- Emergency situations/spills
- Confined space entries/rescues
- Animal cage cleaning

Accepted Engineering Controls

- Ventilation/Exhaust
  - Fume hood
- Isolation
  - Glove box
- Substitution
  - Use of less toxic chemicals

Respirator Selection

- Requires use of National Institute of Safety and Health (NIOSH) approved respirators
- Provides general guidance for selection
- Must select respirators from a sufficient number of models and sizes so it fits correctly

Respirator Selection

Air purifying respirators should be used only when the following conditions have been met:

☑ The identity and concentration levels of the contaminant are known.

☑ The oxygen content is at least 19.5%.

☑ That adequate warning properties exist for the contaminant.

☑ That the concentration does not exceed IDLH levels.

☑ Employee fit tested and trained.

Effective Use of Respirators

Respirators are only effective if properly

- ☑ Selected
- ☑ Fitted
- ☑ Worn

The N and P-95 respirators has the ability to filter particles 1 micrometer with a filter efficiency of >95%. If these respirators become wet, they are no longer effective and must be replaced.

When is a Respirator not working?

- ☑ When breathing becomes difficult
- ☑ Can smell/taste contaminant
- ☑ Detect Irritation of contaminant

Types of respirators:

Air-Purifying Respirators

Utilize ambient air which is "purified" through a filtering element prior to inhalation.

- ***Filtering Respirator(Dust Mask)***
  - Negative pressure particulate respirator with a filter as an integral part of the face piece or with the entire face piece composed of the filtering medium.

Air-Purifying Respirators

Utilize ambient air which is "purified" through a filtering element prior to inhalation.

- ***Full or ½ Mask (Chemical Cartridge)***
  - Negative pressure chemical cartridge respirator with filters as an integral part of the face piece.

PF=10

Air-Purifying Respirators

- Does not supply oxygen
- Not in IDLH situation
- Not oxygen deficient situation (<19.5 %)
- Adequate warning properties
- Know protection factor (PF) is adequate

Air-Supplying Respirators

- ***Respirators for IDLH (or Unknown Concentrations)***
  - A full face pressure demand 30 minute SCBA
  - Combination full face pressure demand airline/SCBA
- ***All oxygen deficient atmospheres are IDLH***
- ***Unknown atmosphere=IDLH***

Medical Evaluation

- Required prior to fit test
- Must be performed by a physician or other licensed healthcare professional (PLHCP) using a medical questionnaire or exam
- Follow up exam if positive answer - any tests or procedures determined by PLHCP
- Provide written procedures, respirator weight, duration and frequency of use, physical effort required, temperature and humidity to PLHCP
- Written report provided to employer and employee

Additional medical evaluation

- Employee reports difficulties using respirator
- PLHCP, supervisor or program administrator specifies the need for further evaluation
- Observations during fit testing or program observation
- Change occurs in workplace

Medical signs and symptoms

The following are signs or symptoms that may prevent the use of a respirator:

- Seizures
- Claustrophobia
- Asthma
- Emphysema
- Pneumonia
- Collapsed lung
- Lung cancer
- Broken ribs
- Chest Injuries/surgeries
- Any other lung problems
- Heart or circulation problems
- Anxiety

Fit Testing

Employees using tight-fitting face piece respirators must be fit tested:

- ☑ Prior to initial use of the respirator.
- ☑ Whenever a different respirator face piece (size, style, model or make) is used.
- ☑ At least annually thereafter.

Note: Additional fit tests must be conducted whenever conditions that could affect respirator fit develop. i.e.. Loss of weight, facial scarring, facial surgery.

Fit Testing

- Facial hair must not inhibit the sealing surface or interfere with valve function
- Must conduct a user seal check before each use

Fit Testing

Qualitative – use of approved substance

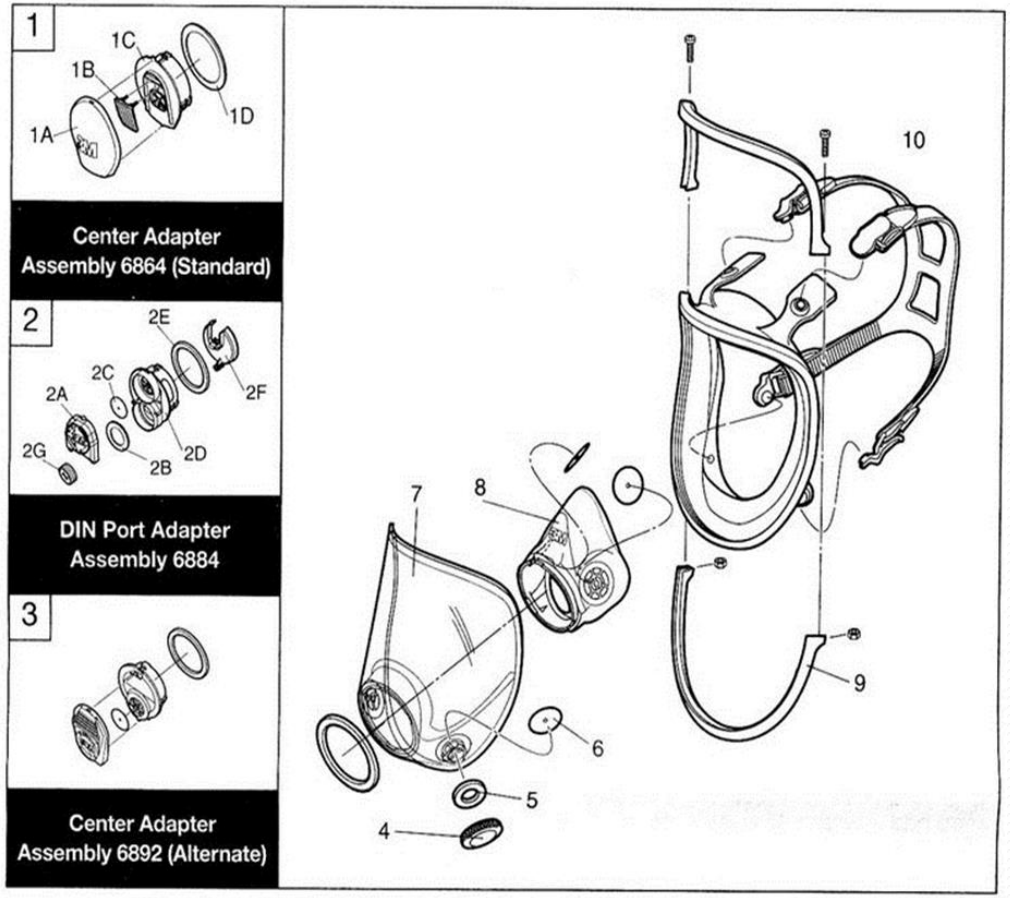
- Bitrex
- **Saccharin**
- Banana oil
- Irritant smoke

Quantitative – use of measuring device

- Measures amount outside and inside of respirator

Inspection and checking seals

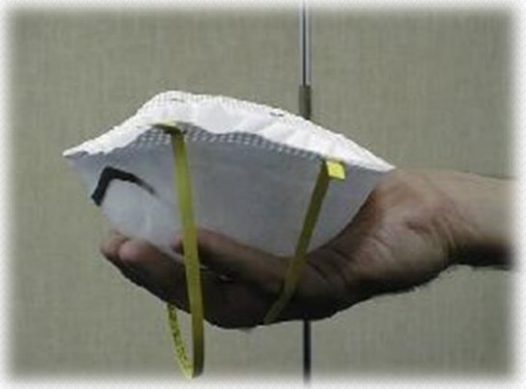
- Always inspect respirator before donning
- Check integrity of seals and cartridges before putting on respirator



Respirator Use

Step 1:
Inspect the respirator.

To begin donning, cup the respirator in your hand with the nosepiece at finger tips allowing the headbands to hang freely below hands.



Step 2 :
Position the respirator under your chin with the nosepiece up.

Respirator Use

Step 3:
Pull the top strap over your head so it rests high on the back of the head.

Step 4:
Pull the bottom strap over your head and position it around neck below ears.

Respirator Use

Step 5:
Using two hands, mold the nosepiece to the shape of your nose by pushing inward while moving fingertips down both sides of the nosepiece. Pinching the nosepiece using one hand may result in less effective respirator performance.

Respirator Use

Face fit check:
The respirator seal should be checked before each use.

To check fit, place both hands completely over the respirator and exhale. If air leaks around your nose, adjust the nosepiece as described in step 5.

If air leaks at respirator edges, adjust the straps back along the sides of your head. Recheck.

Maintenance and Care

Removing the Respirator:

After each use, remove respirator from face and DISCARD.

Each Respirator is to be used ONLY 1 TIME.

Maintenance and Storage

- Cleaning and disinfecting
- Storage
- Inspection

Program Evaluation

- Annual review of the program is required to ensure program is properly implemented and effective

- Employees are to be consulted regularly to assess their views and identify problems.