RESPIRATORY PROTECTION

CAP Safety Meetings

Revision: 03-2012
WHAT IS A RESPIRATOR

Any device that covers the nose and mouth that improves the quality of air being supplied to the lungs.

Common examples:
- Dust Mask
- Gas Mask
- Sandblasting Hood
- Self Contained Breathing Apparatus
WHEN ARE RESPIRATORS NEEDED?

- In an oxygen-deficient atmosphere
- When permissible exposure limits are exceeded
- When you require it by company policy
- When ventilation cannot sufficiently reduce contaminant levels
OXYGEN DEFICIENCY

- Oxygen deficiency can occur in confined or enclosed spaces, during fires or large chemical releases.

- Normal air contains 21% oxygen. An area with oxygen content below 19.5% is considered “oxygen deficient”.

- Only a self contained breathing apparatus (SCBA) should be used to protect against the effects of oxygen deficiency.
PERMISSIBLE EXPOSURE LIMITS (PELs)

- Most chemicals and dusts have limits in the air that will cause adverse health effects if exceeded.

- If airborne levels cannot be reduced below these limits by other means, respirators must be provided to protect exposed employees.
IDLH

- “IDLH” means immediately dangerous to life or health

- Most chemicals have a listed IDLH level, any concentration over that amount is considered IDLH

- Oxygen deficiency is also IDLH

- Unknown atmospheres are considered IDLH

- When required to work in IDLH environments workers must wear a positive pressure SCBA
How to Avoid Using Respirators

One or more of the following controls to reduce exposure to airborne chemicals:

- Ventilation
- Dust suppression with water
- Eliminate use of chemical
- Substitute with a less toxic chemical
- Isolate or enclose the chemical processes
- Other processing changes

Respirators should be used only if these methods are not feasible or do not reduce exposure.
WHY RESPIRATORS ARE THE LAST Choice

Respirators have major limitations:

- They can leak, wear out, or be the wrong kind
- They can be hot, uncomfortable and make it hard to communicate
- They can be hard to breathe through
- They are easily removed in contaminated air
RESPIRATOR SELECTION

❖ One of the most important tasks is selecting the correct respirator for the hazard.

❖ Knowledge of chemical identity, extent of use, levels in the air and permissible limits is needed.

❖ You must conduct a workplace hazard assessment – air sampling may be necessary.
TYPES OF RESPIRATORS

- Air-purifying respirators (APR)– filters air through filters, chemical cartridges or filtering face pieces
- Powered air-purifying respirators (PAPR)– filters air through cartridges with assistance of a blower.
- Supplied air respirators (SAR)– provides clean air from a compressor or compressed air bottles
- Self-contained breathing apparatus (SCBA) – provides clean air from a tank worn by the user, and come in different styles and sizes.
AIR-PURIFYING RESPIRATOR LIMITATIONS

When required to use APRs, there are many precautions that must be taken to ensure their safe use:

- Cartridges must be changed periodically to provide protection from breakthrough of chemicals.
- The right cartridge for the contaminant of concern must be chosen.
- Air-purifying respirators provide protection up to 10 or 100 times the PEL, but will not provide adequate protection when working with certain highly toxic chemicals or at high levels of contaminants.
AIR SUPPLY REQUIREMENTS

When using respirators that supply air to user certain precautions must be taken:

❖ Breathing air must be at least “grade D”

❖ If compressors are used they must have sufficient pressure to provide adequate air supply.

❖ When using compressors place them away from exhaust from other equipment to prevent carbon monoxide exposure

❖ If using hose lines the fittings must be incompatible with other gas fittings, and hoses can never exceed 300 ft.
RESPIRATOR FIT

- Respirators must fit properly

- Fit-testing must be done before first wearing a respirator

- Fit test should be performed on every type of respirator that the worker is expected to use

- Tight-fitting respirators must fit properly to prevent leaks around the edges

- Beards are not allowed when wearing a tight-fitting respirator because they will leak
RESPIRATOR FIT-TESTING

- Required for all tight-fitting respirators.

- Two types of fit tests: Qualitative and Quantitative

- The qualitative fit test procedures rely on a subjective sensation (taste, irritation, smell) of the respirator wearer to a particular test agent.

- The quantitative fit test apparatus utilizes controlled negative pressure (CNP) to measure the volumetric leak rate and replicate the negative force of inhalation; quantifying the respirator fit

- Quantitative methods are more accurate.
SEAL CHECK

- Prior to workers entering areas that require respiratory protection, the worker should perform a negative pressure and positive pressure seal check.

- Negative pressure check- hold hands over the inhalation ports and breathe in, this should create a suction in the mask pulling it towards the face.

- Positive pressure check- hold hand over exhalation port and slightly breathe out which should cause the mask to push away from the face without breaking the mask’s seal.

- These seal check will ensure that the mask is properly fitted to the worker before entering these hazardous areas.
MEDICAL EVALUATIONS

- Medical evaluations are required for anyone wearing respirators.
- Respirator use places a burden on the body.
- Respirators can be hazardous to people with heart or lung problems.
**MEDICAL QUESTIONNAIRE**

- First step in medical evaluation is a confidential medical questionnaire

- Employee completes it and sends it directly to medical provider

- Medical provider decides if medical exam needed

- The results are only used to determine if respirators can be worn.
RESPIRATOR CLEANING & MAINTENANCE

- Respirators must be inspected prior to each use

- Clean respirators in a mild detergent and water, rinse them, and allow them to air dry; strong chemicals and alcohols may deteriorate the respirator

- Store in a clean, dry place in a container or sealed bag

- Respirator maintenance and repair are essential for proper functioning; only allow trained personnel to perform repairs to respirators
EMPLOYEE TRAINING

- Training is required for any employee wearing respirators

- Training must cover why respirators needed, their limitations, how to clean and maintain and how to use

- Hands-on training is especially important for emergencies and SCBA use
RESPIRATORY PROTECTION PROGRAM

Companies are required to develop a written respiratory protection program. This program should include information such as:

- Program administrator
- Written procedures and records
- Proper respirator selection
- Medical evaluation of respirator users
- Fit-testing of respirators to each user
- Respirator maintenance, inspection, repair & storage
- Assured air quality for supplied-air respirators
- Employee training

Employees should be trained and familiar with the specific requirements of their in-house respiratory protection program.