OSHA: Respiratory Protection Programs

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Outline

• Do we need Respirators?
• Program
• Voluntary use

• Program elements
  • Respirator selection
  • Medical evaluation
  • Fit testing
  • Use of respirators
  • Maintenance
  • Air quality
  • Training
  • Program evaluation

Respiratory Protection Standard: Small Entity Compliance Guide
(OSHA 3384 - 2011) [PDF]
Requirements for SDS and shipped labels

Each class and category of hazard requires a harmonized:

- **Signal word**
  - e.g. Danger or Warning

- **Pictogram**
  - e.g. Skull and crossbones

- **Hazard statement**
  - e.g. Fatal if swallowed

- **Precautionary Statement**
  - Examples, but not formally harmonized
  - Currently assigned numbers

Precautionary Statements

- **P:** Prevention
  - Controls including PPE

- **R:** Response
  - Containment, First Aid and Medical Treatment

- **S:** Storage
  - Holding the product on site

- **D:** Disposal
  - Final disposal of waste

Examples of PPE: Respirator Req

- P260: Do not breathe dust/fume/gas/mist/vapours/spray.

- P261: Avoid breathing dust/fume/ gas/mist/vapours/spray.

- P284: [In case of inadequate ventilation] wear respiratory protection.

- P271: Use only outdoors or in a well-ventilated area.
Programs

Program
- Designated program administrator
  - Qualified by appropriate training or experience
- Provide respirators, training and medical evaluation at no cost to the employee
- Written program with worksite specific procedures

Voluntary Use
- General
  - Training
    - Appendix D
  - Program
    - Medical Evaluation
    - Maintenance
    - Cleaned
    - Stored
    - Maintained
- Filtering Facepiece
  - Training
    - Appendix D
Program Elements

• Respirator Selection
• Medical Evaluations
• Fit testing
  ▪ Quantitative and Qualitative
• Proper Use
• Maintenance Procedures and Schedules
  ▪ Including change schedules
• Training of Employees
• Program Evaluation

Selection

Respirators to be Used Only:

♦ When engineering controls are
  ▪ Not feasible
  ▪ Not effective
  ▪ Being Installed
  ▪ Being Repaired

♦ For emergencies

♦ Other temporary (intermittent) operations
Background: Types of Respirators

- Air Purifying
- Air Supplying

Chemical Cartridges

- Organic vapor
- Acid gas
- Combinations

- Ammonia
- Methylamine
- Formaldehyde
- Hydrogen fluoride
- Mercury
- Chlorine
- Ozone
- Others
Background: Types of Respirators

**Air Purifying:**
- Negative Pressure
- Powered (PAPR)

**Air Supplying:**
- Airline
- Self Contained

**Fitting:**
- Tight Fitting
- Loose Fitting
Selection of Respirators

Employer must select and provide an appropriate respirator based on the respiratory hazards to which the worker is exposed and workplace and user factors that affect respirator performance and reliability.

End-of-Service-Life Indicator (ESLI)

A system that warns the user of the approach of the end of adequate respiratory protection, e.g., the sorbent is approaching saturation or is no longer effective.

Decision Logic
NIOSH Decision Logic

- If Firefighting
- If Oxygen Deficient (<19.5%)
- Emergency Use?
- Concentration below Appropriate Limits?
- IDLH environment if respirator fails?
- Eye irritant or eye damage from exposure?
- Calculate Hazard Ratio (for normal and emergency conditions)
- If gas or vapor, and if there are not adequate warning properties
- Select air purifying element suitable to the contaminant
- Select respirator with suitable APF (APF > HR) that has not been eliminated

Assigned Protection Factors

- Half Mask
  - PF=10
- Loose-Fitting Facepiece
  - PF=25
- Full Facepiece
  - PF=50

Medical Evaluation
Medical Evaluation

- Evaluate ability to wear a respirator
- Prior to fit testing or required use.
- Start with questionnaire
  - in appendix
- Follow-up by PLHCP may include
  - Additional tests
  - Consultations
  - Diagnostic procedures

Information Exchange

- To PLHCP
  - Type and weight of respirator
  - Duration and frequency of use
  - Physical work effort
  - Additional protective clothing
  - Temperature and humidity extremes
  - Written program and OSHA standard

- Back to Employer limited to:
  - Limitations of use
    - Related to either medical conditions or workplace conditions
    - Includes whether or not the employee is medically able to use the respirator
  - The need for follow-up medical evaluations
  - A statement that the employee has been given with a written copy of the recommendations

Fit Testing
Fit Testing
Required for tight fitting facepiece

Types

- Qualitative
- Quantitative

Fit Testing: Qualitative Fit Tests

- APF up to 10
  - (FF up to 100)
- Methods
  - Irritant smoke (stannic chloride)
  - Isoamyl acetate (banana oil)
  - Saccharin aerosol
  - Bitrex aerosol
- Subjective
Fit Testing: Quantitative Fit Tests

- FF
  - 100 or greater (HF)
  - 500 or greater (FF)
- Adapter for N95 testing

Employer Specific Procedures

- Prohibit conditions that may result in facepiece seal leakage
  - Facial hair
  - Glasses or other PPE that interfere
- Prevent employees from removing respirators in hazardous environments
- Ensure effective respirator operation throughout the work shift
Use of Respirators Procedures

- Ensure user seal checks for tight fitting respirators

Positive Pressure Check

Negative Pressure Check

Maintenance of Respirators

- Cleaning
- Disinfecting
- Storing
- Inspecting
- Repairing
- Discarding
- Otherwise maintaining

Maintenance of Respirators: Gasses and Vapors

- Change Schedules
  - Based on expected concentrations
  - Amount of time at that concentration, then changeout is necessary
  - Cannot rely on odor detection alone

- End of Service Life Indicators
Special Use Conditions

- Emergencies
- IDLH Environments
- Structural Firefighting
- Escape Only

Training

Potential respiratory hazards

Proper use of respirators
- Putting on and removing the respirator
- Limitations on use of respirator
- Maintenance of respirator
Written Program

Written Respirator Program

- Respirator Selection
- Medical Evaluations
- Fit testing
  - Quantitative and Qualitative
- Proper Use
- Maintenance Procedures and Schedules
  - Including change schedules
- Training of Employees
- Program Evaluation

Annual Program Evaluation

- Purpose of evaluation
  - To ensure that program is implemented
  - To ensure that employees are properly wearing respirators
- Conduct of evaluation
  - Consult employees
  - Assess respirator fit
  - Assess proper selection
  - Assess proper use
  - Assess proper maintenance
Resources

References
OSHA respiratory protection standard
  • 29 CFR 1910.134
American National Standard for Respiratory Protection
  • ANSI Z88.2-1992
American Industrial Hygiene Association
Respiratory Protection Manual

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