Personal Protective Equipment (PPE) and Respiratory Protection

- Personal Protective Equipment, PPE
- Regulated by OSHA 1910.132
- Requires employers to supply PPE and have workers use the equipment to protect them from harm.
Types of PPE

- Foot Protection- Hard toe shoes & Rubber boots,
- Eye and face protection- Safety glasses, Goggles, face shields, Welding glasses.
- Respirators- Dust Masks, full and half face mask respirators with filters or canisters, Self Contained Breathing Apparatus, powered air respirators.
- Hand Protection- Special gloves of a wide variety to protect against physical nicks, cuts, bruises or, friction, Chemical protection, electrical,
Respiratory Protection
Inspection and Maintenance

- PPE needs to be properly maintained and in safe condition.
- Respirators must be inspected Monthly.
- Workers must be trained in its use. New Emphasis by OSHA on this.
- We are required to do an assessment of plant areas to document what needs to be worn and under what conditions.
PPE Hazard Assessment

- Areas of the facility are to be evaluated for the presence of hazards associated with foot, head, eye, face, hand, ears, respiratory and skin injury possibility.

- Grain elevator facilities
  - a. Head house and other grain handling areas
  - b. Grain receiving and shipping
  - c. Rail operations
  - d. General grounds
  - e. Barge loading/unloading
  - f. Maintenance shops
  - g. Grain storage.
  - h. Electrical control and MCC Rooms.
**PPE Hazard Assessment**

### Certification of Hazard Assessment

<table>
<thead>
<tr>
<th>Area Assessed:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person performing assessment:</td>
<td>Title:</td>
</tr>
</tbody>
</table>

#### Hazards

<table>
<thead>
<tr>
<th>Hazard Description</th>
<th>Yes</th>
<th>No</th>
<th>Continuous</th>
<th>Conditional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Temperature</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Extreme Cold</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Chemical Exposure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust or Flying Particles</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Light Radiation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Welding/Cutting</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>High-Intensity Lights</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Noise</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Falling or Flying Objects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slippery Surfaces</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharp Objects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rolling/Pinching Objects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dropping Objects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall from Heights Above 4'</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Personal Protective Equipment Required (Continuously)**

- Hard Hat
- Footwear
- Safety Glasses
- Other Respirator
- Face Protectors
- Arm Protectors
- Hearing Protectors
- Electrical Protective Equipment
- Gloves
- Other

<table>
<thead>
<tr>
<th>Personal Protective Equipment Required (Conditionally)</th>
<th>PPE Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condition 1</td>
<td>a.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition 2</td>
<td>a.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition 3</td>
<td>a.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition 4</td>
<td>a.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition 5</td>
<td>a.</td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition 6</td>
<td>a.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Signature of Person Performing Assessment:**

<table>
<thead>
<tr>
<th>Title:</th>
</tr>
</thead>
</table>

---
Training Requirements

Training shall address:

- when PPE is necessary;
- what type is necessary;
- how to wear it properly;
- limitations of selected PPE;
- it’s proper care, maintenance,
- it’s useful life and disposal

When to do training

- Initially
- if PPE Changes
- If changes in workplace
- If workers shows they did not retain training.
- All training is to be certified (written record)
### PERSONAL PROTECTIVE EQUIPMENT

#### TRAINING CERTIFICATION

<table>
<thead>
<tr>
<th>Facility Name:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility Location:</td>
<td></td>
</tr>
<tr>
<td>Employee Name:</td>
<td></td>
</tr>
</tbody>
</table>

#### INSTRUCTION PROVIDED IN:

- [ ] WHEN PPE IS NECESSARY
- [ ] WHAT PPE IS NECESSARY
- [ ] USE, CARE, MAINTENANCE, USEFUL LIFE, LIMITATIONS AND DISPOSAL PROCEDURES FOR THE FOLLOWING:
  - [ ] HEARING PROTECTORS
  - [ ] EYE PROTECTION
  - [ ] FACE PROTECTORS
  - [ ] FOOTWEAR
  - [ ] HARD HATS
  - [ ] FALL PROTECTION
  - [ ] GLOVES
  - [ ] ARM PROTECTORS
  - [ ] ELECTRICAL PROTECTIVE EQUIPMENT
  - [ ] OTHER

#### THE ABOVE NAMED EMPLOYEE HAS DEMONSTRATED THE FOLLOWING

- [ ] A PROFICIENCY IN THE USE, CARE, MAINTENANCE AND DISPOSAL PROCEDURES OF THE ABOVE LISTED PERSONAL PROTECTIVE EQUIPMENT
- [ ] A KNOWLEDGE IN THE USEFUL LIFE, LIMITATIONS AND WHEN TO WEAR THE ABOVE LISTED PERSONAL PROTECTIVE EQUIPMENT.
- [ ] RESPIRATORY PROTECTION

<table>
<thead>
<tr>
<th>Facility Manager or Designate:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee Signature:</td>
<td></td>
</tr>
</tbody>
</table>
Respiratory Protection Standard

a) Permissible Practice
b) Definitions
c) Respiratory Protection Program
d) Selection of Respirators
e) Medical Evaluation
f) Fit Testing
g) Use of Respirators
h) Maintenance & Care of Respirators
Respiratory Protection Standard

i) Breathing Air Quality & Use
j) Identification of Filters, Cartridges & Canisters
k) Training & Information
l) Program Evaluation
m) Recordkeeping
n) Dates of Compliance
Respiratory Protection Standard

• Appendices
  • A  Fit testing Procedures
  • B 1 User Seal Check Procedures
  • B 2 Respirator Cleaning Procedures
  • C  Medical Evaluation Questionnaire
  • D  Information for Employees using Respirators Voluntarily
Respiratory Protection Standard

This section applies to:

- General Industry (part 1910)
- Shipyards (part 1915)
- Marine Terminals (part 1917)
- Longshoring (part 1918)
- Construction (part 1926)
Permissible Practice
1910.134(a)(1)

In the control of those occupational diseases caused by breathing air contaminated with harmful substances… the primary objective shall be to prevent atmospheric contamination.
Permissible Practice

Engineering
Where engineering control measures are not feasible, or are being instituted, appropriate respirators must be used.
Respirators shall be provided by the employer when such equipment is necessary to protect the health of the employee.
# Potential Respiratory Hazards

**What respiratory hazards are you concerned with?**

<table>
<thead>
<tr>
<th>SUBSTANCE</th>
<th>OSHA PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain Dust - Barley, Oats Wheat</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td>Grain Dust - PNOR (Corn, Soybean)</td>
<td>15 mg/m³</td>
</tr>
<tr>
<td>Phosphine</td>
<td>0.3 ppm</td>
</tr>
<tr>
<td>Ammonia</td>
<td>50 ppm</td>
</tr>
<tr>
<td>Chlorine</td>
<td>1 ppm</td>
</tr>
</tbody>
</table>
Identify & Evaluate Respiratory Hazards

The employer shall identify and evaluate the respiratory hazard(s) in the workplace...shall include a “reasonable estimate” of employee exposure...
Selection of Respirators

How do you make a “Reasonable Estimates” of employee exposure?

Monitoring -
Composite of Data -
Mathematical Approaches -
Respiratory Protection Program

Program is required whenever:

- Concentration > PEL,
- Employer requires respirator use.
Must establish and implement a written respirator program with worksite-specific procedures.

Are respirators:
- necessary to protect the health of the employee; or
- required by the employer?

**YES**

Must establish and implement a written respirator program with worksite-specific procedures.

**NO**

Does the employer permit voluntary use of respirators?

**YES**

Does the only use of respirators involve the voluntary use of filtering facepieces (dust mask)?

**YES**

- Respirator itself does not create a hazard,
- Provide copy of Appendix D,
- No Respirator Program required.

**NO**

- Respirator itself does not create a hazard,
- Provide copy of Appendix D,
- Medical approved to use the respirator

**STOP**
Program Requirement Clarification

- Required Use = Full Program
- Voluntary Use = Appendix D (Exception - When traditional style respirators are used a “Medical Evaluation” is required).
General Requirement
1910.134(c)(3)

Trained Program Administrator

The employer shall designate a program administrator who is qualified by appropriate training or experience to oversee the program.
1910.134(c)(1)

- Develop and implement worksite-specific procedures and elements for required respirator use.
Selection of Respirators

1910.134(d)(3)

Select respirators that are adequate to protect the health and to ensure compliance with all other OSHA standards.

Routine;

Reasonably foreseeable emergency situations.
Selection of Respirators
1910.134(d)(1)(ii)

ONLY USE

CERTIFIED RESPIRATORS
Selection of Respirators

1910.134(d)(3)

The respirator selected shall be appropriate for the chemical state and physical form of the contaminant.
Selection of Respirators
1910.134(d)(3)(iii)(b)(2)

ESLI or Schedule

Employer must implement a change out schedule for canisters and cartridges... changed before the end of its service life.
Selection of Respirators
1910.134(d)(1)(iii)

Identify & Evaluate Respiratory Hazards

If you cannot identify or reasonably estimate the employee exposure...must consider the atmosphere to be IDLH.
Selection of Respirators

Definition

- Immediately Dangerous to Life and Health (IDLH)

...is an atmosphere that poses an immediate threat to life, would cause irreversible adverse health effects, or would impair an individual’s ability to escape from a dangerous atmosphere.
Selection of Respirators

- Atmosphere at or above the NOISH IDLH level.
- Oxygen-deficient atmospheres.

SCBA 30min  SAR with Auxiliary SCBA
Use of Respirators

When Entering IDLH Atmospheres

- One person or more, trained, equipped & located outside the IDLH area ready to provide effective rescue,
- Communication,
- Notify / additional assistance if rescue is needed,
- Retrieval equipment,
- SCBA or SA with escape SCBA.
Use of Respirators

1910.134(g)

- The standard requires the employer to establish and implement procedures for the proper use of respirators.
Use of Respirators

Face piece seal protection

• Prohibited Conditions:
  • Removing the respirator in a hazardous environment
  • Facial hair...between face/facepiece
  • Glasses or goggles
  • Any condition that interferes with the face-to-facepiece seal or valve function
The employer shall provide a medical evaluation to determine the employee’s ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace.
Respiratory Medical Evaluation
Physiological burden associated with respirator use varies with:

- Type of respirator worn
- Job tasks
- Workplace conditions
- Medical status of the employee
Job/Workplace Conditions

- Nature of exposure hazard(s)
- Duration of respirator use
- Frequency of respirator use
- Level of physical work effort
- Use of heavy and/or impervious protective clothing
- Temperature and humidity extremes
Scope of Examination

- Use the Medical Evaluation Questionnaire found in Appendix C
- Identify a physician or other licensed health care professional to perform evaluations
Administration Of Questionnaire Examinations

- Confidentiality
- During employee’s normal working hours
- In manner that ensures understanding
- Including opportunity for employee to discuss questionnaire and examination results
Supplemental Information for Health Care Professional

- Written Respiratory Protection Program,
- Selected respirator(s)
- Substance(s)
Medical Recommendation

- Respirator
- User
- Medical Recommendation
- Job
- Program
FIT TESTING
1910.134(f)
FIT TESTING
1910.134(f)

- All employees required to use tight fitting negative or positive pressure respirators must be fit tested.
Tight-Fitting Respirators

Half Mask

Filtering Facepiece
Use of Respirators

Appendix B-1

User Seal Check

Positive

Negative

Employees must perform a user seal check each time they put on a tight fitting respirator.
Fit Testing Requirements

Employees using tight fitting respirators must pass an appropriate qualitative (QLFT) or quantitative (QNFT) fit test.
Tight-Fitting Respirators

Half Mask

Full Facepiece
Loose Fitting Respirators

Hood

Helmet

Facepiece
Fit Testing

- Qualitative fit testing methods are subjective in nature and rely on the judgment of the test subject. A proper fit is determined if the respirator wearer does not detect the taste of the test solution in an controlled environment.
Qualitative Fit Testing
Qualitative Fit Testing (QLFT)
Appendix A

• Four accepted protocols (OSHA)
  • **Bitrex** (denatonium benzoate)
  • Saccharin
  • Isoamyl acetate (banana oil)
  • Irritant smoke (stannic chloride)
Fit Testing

- Quantitative fit testing methods rely on objective data to determine a proper fit. As a result, the test produces quantifiable results.
FIT TESTING
1910.134(f)

• For tight-fitting PARPs, SAR and SCBA must fit tested in the negative pressure mode.
Fit Testing

What type of fit test must be done when using this type of respirator?

QLFT or QNFT?
## Acceptable Fit testing Methods

<table>
<thead>
<tr>
<th>Type of Respirator</th>
<th>QLFT</th>
<th>QNFT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half-face, Negative Pressure APR (Up to 10X PEL)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Full-face, Negative Pressure APR (Up to 10X PEL)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Full-face, Negative Pressure APR (Over 10X PEL)</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Phosphine PEL is 0.3 ppm

QLFT (up to 10 X PEL)
0.3 - 3.0 ppm

QNFT (over 10 X PEL)
0.3 - 15 ppm
Fit Testing Frequency

- Prior to initial use
- Annually thereafter
- Whenever a different facepiece is to be used
- Whenever changes affecting respirator fit are observed
- Whenever employee determines fit is unacceptable
Maintenance & Care of Respirators
1910.134(h)
Maintenance & Care of Respirators

• Cleaning / Disinfecting
  • Respirators must be clean and maintained in a sanitary condition.
  • According to Appendix B-2
Maintenance & Care of Respirators

Properly store all respirators:

- Protected from damage

- Emergency Respirators:
  - Stored in compartments or covers marked as “Emergency Respirators
  - According to the Manufacturer
Insure Respirators are Inspected:
- Respirators used routinely:
  - Before each Use and during cleaning
- Emergency use respirators:
  - Before and after each use.
  - At least monthly
  - According to manufacturer instructions.
Maintenance & Care of Respirators

- Certification of Inspections (Emergency Use Respirators):
  - Documentation
  - Tag attached to the storage compartment or other record.
1910.134(k) TRAINING
Training and Information

General Requirements

- Training must be provided to all employees who are required to wear a respirator.
- Must be: Comprehensive, Understandable,
Training and Information

Employees must be able to demonstrate knowledge of:

- Why a respirator is necessary
- What are the limitations and capabilities of the respirator
- How to use the respirator effectively in emergency situations, including malfunction
- How to inspect, don/doff, use and check the seals of the respirator
Training and Information

Employees must be able to demonstrate knowledge of:

- The procedures for respirator maintenance and storage
- How to recognize medical signs & symptoms that may limit the effective use of the respirator
- General requirements of 1910.134
Training and Information Frequency

- Prior to initial respirator use,
- Annually thereafter,
- Changes in the workplace or respirator type,
- Inadequacies in the employee’s knowledge,
- Any other situations in which retraining appears necessary to ensure safe respirator use.
Training and Information
Voluntary Use

The employer is to provide basic information on respirators to employees wearing respirators on a voluntary basis (Appendix D).
1910.134(l)

To insure that the program is properly implemented and continues to be effective.
The employer must establish and retain written information:

- Program
- Medical Recommendation
- Fit Testing
- Training
Questions?