Lead: OSHA Standards and Regulations

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Objectives

• Health effects, uses, exposure
• OSHA Lead Standard for construction - 29 CFR 1926.62
• Contrast with EPA Renovation, Repair & Painting Program
Health Effects

- Central nervous system
- Cardiovascular system
- Reproductive system
- Hematological system (blood-forming)
- Kidneys
Lead Exposure

- Inhalation
  - Dust, fume, or mist
- Ingestion (personal hygiene)
- Lead is stored in various organs and body tissues
- Stored lead has a half-life (excreted)
- Amount absorbed vs. amount excreted
At risk populations

- Children under the age of 6
  - Inhalation & ingestion
- Unborn children
  - Transferred from the mother
- Elderly & disabled
Uses

• Roofs, cornices, tank linings, and electrical conduits
• Soft solder, is an alloy of lead and tin (banned for many uses in the United States)
• Inhibits the rusting and corrosion of iron and steel
  – Bridges, railways, ships, lighthouses, and other steel structures
• Banned in residences
Work Practices that Increase Exposure

- Abrasive blasting
- Welding, cutting, and burning on steel structures
- Lead burning
- Using lead-containing mortar
- Power tool cleaning without dust collection systems
- Rivet busting
- Cleanup activities where dry expendable abrasives are used
- Movement and removal of abrasive blasting enclosures
- Manual dry scraping and sanding
- Manual demolition of structures
- Heat-gun applications
- Power tool cleaning with dust collection systems
- Spray painting with lead-based paint
OSHA Lead Standards

• 1926.62 – Construction
  – Construction, alteration, repair, painting, decorating and maintenance associated therewith

• Permissible Exposure Limit (PEL)
  – 50μg/m³ of air

• Action Level (AL)
  – 30μg/m³ of air

• 50μg = 0.0000001102311 lbs
Exposure Assessment

• No trigger level
• Initial Assessment
  – Monitoring results and,
    • Information, observation, calculations, or
    • Previous measurements, or
    • Complaint of symptoms
• Historical Data
  – Employer collected
  – Past 12 months
  – Conditions which, in all relevant and significant respects, are essentially the same as the current project
Exposure Assessment

- **Objective Data**
  - Product or material
  - Specific process, operation, or activity
  - Keep documentation on the nature and relevancy
  - Can not be used for exposure assessment of high exposure tasks

- **Pending Results**
  - PPE, hygiene facilities, biological monitoring and training
  - Respiratory protection level is task dependent (high exposure)
High Exposure Tasks

- **Group 1: Assumed exposure at PEL**
  - Manual scraping and sanding
  - Manual demolition of structures
  - Heat-gun applications
  - Power tool with dust collection systems
  - Spray painting with lead-based paint

- **Group 2: Assumed exposure at 10 x PEL**
  - Lead burning
  - Using lead-containing mortar
  - Power tool cleaning without dust collection systems
  - Rivet busting
  - Cleanup activities where dry expendable abrasives are used
  - Movement and removal of abrasive blasting enclosures

- **Group 3: Assumed exposure at 50 x PEL**
  - Abrasive blasting
  - Welding, cutting and burning on steel structures
Exposure Assessment

- Results < AL
  - Discontinue monitoring
  - Reevaluate if change in process
- Results AL > PEL
  - Follow-up monitoring 6 months
  - Two consecutive results below AL
- Results > PEL
  - Follow-up quarterly
  - Two consecutive results below PEL or below AL
- Employee Notification
  - Within 5 days of receiving results
Monitoring Equipment

MSA Escort ELF

SkC AirChek 2000

Mixed Cellulose Ester Filter (MCEF)
Calibration Equipment

Gilian Gilibrator

Bios DryCal
Air Monitoring

- Use established sampling/analytical method
  - OSHA ID-121, OSHA ID-125G, OSHA ID-206, OSHA ID-105, OSHA 1006
  - NIOSH 7082, NIOSH 7105, NIOSH 7300
- Sampling techniques
Worker Protection Program

For employees exposed to lead at or above the PEL

- Hazard determination, including exposure assessment
- Medical surveillance and provisions for medical removal
- Job-specific compliance programs
- Engineering and work practice controls
- Respiratory protection
- Protective clothing and equipment
- Housekeeping
- Hygiene facilities and practices
- Signs
- Employee information and training
- Recordkeeping
• Written Compliance Program
  – Description of activities
  – Means to achieve compliance
  – Technology considered to meet PEL
  – Air monitoring data
  – Safe work practices
  – Administrative control schedule
  – Arrangements on multi-contractor sites
  – Revised at least annually
Compliance

- Hierarchy of controls
  - Engineering
  - Administrative
  - PPE
Compliance

• Engineering
  – LEV/GEV
    • HEPA filtered
  – Modification of equipment process
  – Material substitution
  – Component replacement
  – Isolation/automation
Compliance

• Administrative
  – Housekeeping
    • HEPA vacuuming
    • Wet dusting
    • Waste sealed in impermeable bags/containers
    • No compressed air
• Administrative Cont’
  – Hygiene Facilities/Practices (Exposure above the PEL)
    • No eating, smoking, drinking, or cosmetics
    • Change areas – Don’t take it home with you
    • Showers where feasible
    • Eating facilities
    • Washing facilities (irrespective of exposure)
    • Proper disposal/laundering of clothes
Compliance

• Personal Protective Equipment (Exposed above the PEL)
  – Provided at no cost to employee
  – Cannot leave worksite – Change areas
  – Label containers used for:
    • Cleaning, laundering, disposal
  – Do not remove lead by:
    • Brushing, shaking, or blowing
• Examples of PPE
  – Coveralls or similar full-body work clothing;
  – Gloves, hats, and shoes or disposable shoe coverlets
  – Face shields, vented goggles
  – Other appropriate protective equipment
Compliance

• Respiratory Protection
  – Used w/engineering controls when exposed above PEL
  – When waiting for results or installing engineering/administrative controls
  – Upon request by employee
  – Implement a Respiratory Protection Program
    • Medical evaluation
    • Fit testing
    • Respirator Selection
    • Maintenance/Care
    • Training
Medical Surveillance

• Exposed on any day at or above AL – Initial Surveillance
  – Biological monitoring

• Exposure at or above the AL for more than 30 days a year – Surveillance Program
  – Biological monitoring
  – Physical Exams
  – Medical removal
    • Employee protections and benefits
  – Recordkeeping requirements
• Comply with Hazard Communication Standard 1926.59 (1910.1200)
• Additional requirements for exposure at/above AL or skin/eye irritation from lead compounds
• Before initial job assignment
• Repeated annually for exposures above the AL
Warning Signs

- Must post the following:

  WARNING  
  LEAD WORK AREA  
  POISON  
  NO SMOKING OR EATING
Recordkeeping

• Exposure assessment
  – Kept for 30 years
• Medical surveillance
  – Kept for length of employment plus 30 years
• Medical removal documentation
• Objective data
• Available for review
  – Employees
  – Former employees
  – Employee representatives
  – OSHA
EPA Lead-RRP Final Rule

• Persons performing renovations and dust sampling are properly trained
• Renovators, the renovation firms and dust sampling technicians are certified
• Lead-safe work practices are followed during renovations
• Training providers are accredited
• Update pre-renovation education rule to include child occupied facilities
EPA Lead-RRP Scope

- Renovation-modification of a structure with the disturbance of painted surfaces, including window replacement
- Applies to target and child occupied facilities and done for compensation
- Kindergarten classrooms and daycare facilities included (may be in public or commercial buildings)
EPA Lead-RRP Scope Exclusions

- Affected components are lead-free
- Small areas (≤6 ft² inside and ≤20 ft² outside)
- Window replacement is not excluded
- Work done by individuals in housing that they own and occupy
EPA Training, Certification, and Work Practice Requirements

• All firms must be certified (even sole-proprietors)
• Renovators must be certified
• Workers must be trained
• Lead-safe work practices must be followed
  – Work-area containment
  – Prohibition of certain work practices
    • Open-flame burning
    • Power tool use without HEPA exhaust control
  – No dry sweeping or compressed air for cleaning
  – Thorough clean-up
  – Verification procedure
Comparison

**OSHA**
- All construction work
- Any detectable levels
- Private employers/Federal Agencies
- Exposure assessment
- Written Program

**EPA**
- Pre 1978 residences/child occupied facilities
- Abatement excluded
- Renovators/Owners
- Lead free
- Minor repairs/maintenance
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Free fact sheets, guidance documents, pocket guides and hundreds of other publications.

Industry and hazard specific information.
Laminated pocket cards provide straightforward information on how to stay safe and healthy.

In English, Spanish and other languages.
QuickTakes

Twice monthly newsletter helps you track the latest trends and learn about new safety and health tools and services.
Protecting Workers from Lead Hazards

Clearing up after a flood requires hundreds of workers to remove debris and repair, tear down and dispose of, damaged or destroyed structures and materials. Repairs or renovation and demolition operations often generate dangerous airborne contamination of lead, a metal that can cause damage to the nervous system, kidney, blood forming organs, and reproductive system if inhaled or ingested in dangerous quantities. The Occupational Safety and Health Administration (OSHA) has developed regulations designed to protect workers involved in construction activities from the hazards of lead exposure.

How You Can Become Exposed to Lead

Lead is an ingredient in thousands of products widely used throughout industry, including lead-based paints, lead solder, electrical materials and conductors, tank linings, plumbing fixtures, and many metal alloys. Although many uses of lead have been banned, lead hazards continue to be used on bridges, sewers, and other metal structures around the nation. Some are coated with rust and corrosion-inhibiting chemicals. Also, many homes were painted with lead-containing paints. Significant lead hazards can also occur when paint is disturbed from surfaces previously covered with painted surfaces.

Significantly, lead that can generate lead dust includes:
- Lack of protective clothing;
- Lack of personal protective equipment;
- Lack of respirators;
- Lack of adequate ventilation;
- Lack of adequate training.

Major Elements of OSHA's Lead Standard

- Personal protective equipment
- Respirators
- Personal hygiene
- Training
- Record-keeping
- Monitoring
- Medical surveillance
- Protective clothing
- Materials and products
- Ventilation
- Maintenance
- Radiation
- Other

OSHA has produced a quick card on lead in construction and an OSHA Fact Sheet on protecting workers from lead hazards. These resources provide additional information on lead exposure and how to protect workers from its hazards. For more information, visit OSHA’s website at www.osha.gov.
Objective Review

- Why lead is hazardous
- OSHA Standards for Lead
- Brief contrast of OSHA Standards with HUD/EPA Safe Work Practices
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Any questions?

THANK YOU