



Department of

*Environmental  
Safety*

DIVISION OF ADMINISTRATIVE AFFAIRS

---

**LEAD  
MANAGEMENT  
PLAN**

Original – February 2003

Revised – November 2012

---

## Emergency and Assistance Telephone Numbers

<b>UM Emergency (Fire - Police - Rescue) - 24 hours #</b> CALL IMMEDIATELY FOR <u>ANY</u> EMERGENCY INCLUDING CHEMICAL SPILL, FIRE, PERSONAL SECURITY, INJURED OR SICK PERSON	<b>911</b>
Environmental Safety (Main Office) (Industrial Hygiene, Occupational Safety, Hazardous Waste Management, Fire Protection, Radiation Safety, Insurance Services, Hazard Communication, Accident Investigation, Air Monitoring and Safety Education)	(301) 405-3960
University Health Center - Occupational Health (Medical Consultation and Evaluation)	(301) 314-8172
Facilities Management Work Control Center (Repair of Facility Equipment Deficiencies, e.g., steam line leaks, electrical failures, ventilation problems, etc.)	(301) 405-2222
Maryland Poison Control Center	1-800-492-2414

---

## Table of Contents

Emergency Telephone Numbers	i
Table of Contents	ii
Policy Statement	1
Glossary of Terms	4
Applicable Regulations	7
Assessment Conditions	9
Monitoring and Sampling	10
Selection of Units for Testing	11
Exposure Monitoring	12
Training	15
Medical Surveillance	17
Personal Hygiene Practices	18
Respiratory Protection	19
Occupant Health and Safety	20
Signage	21
Work Practices	22
OSHA Record Keeping	24
Waste Disposal	25
MDE Notifications	28
Program Evaluation	29
Appendix A – OSHA 29 CFR 1910.1025, Appendix A and B	30
Appendix B – Lead-Based Paint Deminimus Activities	40
Appendix C – Non-Assessed Tasks	41
Appendix D – Operations and Maintenance (O&M) Tasks	42

---

this page intentionally blank

# Policy Statement

## I. Purpose.

This is a statement of official University policy to establish the process for compliance with Lead Exposure in Construction (29 CFR 1926.62), Lead Exposure in General Industry (29 CFR 1910.1025), and Procedures for Abating Lead Containing Substances from Buildings (COMAR 26.02.07).

## II. Policy.

The University is dedicated to providing safe and healthful work facilities for students and employees, and complying with federal and state occupational health and safety standards. Administrators, project managers, faculty, staff and students all share responsibility for minimizing their exposure to lead.

The Lead Management Plan shall be implemented for all facilities at the University of Maryland where potential exposure to lead may occur.

The Lead Management Plan shall be reviewed and evaluated for its effectiveness periodically, and updated as necessary.

## III. Responsibilities.

### A. Department of Environmental Safety (DES) shall:

1. Develop and distribute the written Lead Management Plan;
2. Assist in identifying employees and coordinate their training. (See Training Section for more specific training information). The training content will depend upon the nature of the activity:
  - (a) For employees who have the potential to be exposed to lead at any level, and are not working in construction, they must be informed annually of the contents of 29 CFR 1910.1025, Appendix A (Substance Data Sheet for Occupational Exposure to Lead) and Appendix B (Employee Standard Summary).
  - (b) For employees who have the potential to be exposed to lead at or above the action level of 30 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ), and are working in construction, must be provided a training program as outlined in 29 CFR 1926.62(l).
  - (c) For employees who are exposed to lead in any form, for example, painters and carpenters involved in the disturbance of lead-based paint, and are not performing lead-based paint abatement activities or construction, and are exposed to lead in excess of  $30 \mu\text{g}/\text{m}^3$  on any day during a given year, must be provided a training program as outlined in 29 CFR 1910.1025(l)(1)(ii).
  - (d) For employees performing lead-based paint inspections, or performing lead-based paint risk assessments, must attend Maryland Department of the Environment approved training courses.
  - (e) For employees performing lead-based paint abatement, must attend

- Maryland Department of the Environment approved training courses.
- (f) Depending on the job description, such as project supervisor, project designer, etc., there are other accredited MDE training courses. They are listed under the Training section of this Plan.
- 3. Maintain records of employee participation in training and provide confirmation back to the departments the list of participants;
  - 4. Perform exposure monitoring as requested by supervisors;
  - 5. Coordinate assessment of materials to determine lead content as necessary to determine exposure potential;
  - 6. Maintain lead sampling results information;
  - 7. Provide technical guidance to personnel at all levels of responsibility concerning lead, hazard evaluation, and hazard control;
  - 8. Review periodically the lead management plan and revise as necessary;
  - 9. Maintain XRF equipment and dosimetry as required; and
  - 10. Dispose of lead waste generated by either contractor or campus employee activities in accordance with local, Maryland, and federal requirements for the disposal of toxic wastes.
- B. The Occupational Health Unit of the University Health Center shall:
- 1. Coordinate and direct all required or recommended medical surveillance for employees as dictated by regulations;
  - 2. Provide medical consultations and examinations for workers who have been overexposed or believe they may have been overexposed to lead; and
  - 3. Maintain medical records relating to consultations, examinations and medical surveillance as required by law.
- C. Facilities Management Capital Projects and Facilities Management Operations and Maintenance (O&M) shall:
- 1. Oversee contracts requiring disturbance of lead-bearing materials;
  - 2. Identify requirements for compliance with applicable Federal and State lead regulations in contract specifications;
  - 3. Coordinate material assessment and provide lead-based paint inventory information to DES for projects administered;
  - 4. Provide DES with information such as lead air and dust sampling results as necessary to evaluate potential exposures to UM employees or satisfy information requests from UM employees and regulatory agencies related to construction operations;
  - 5. Interface with contractors where enforcement of related contract provisions is required;
  - 6. Maintain submittal documents and related records from abatement contracts in a manner that is readily retrievable in case of a regulatory inspection;
  - 7. Communicate requirements to contractors;
  - 8. Ensure lead waste is managed according to all applicable regulations of this Plan; and
  - 9. Ensure that paint used contains less than 0.06% lead, which is considered lead-free by the Consumers Product Safety Commission (CPSC).
- D. Department Heads shall:
- 1. Assure that all employees who have potential to contact lead containing

- 
- materials are aware of the hazards associated with lead;
  2. Assure that all employees who have potential to contact lead containing materials receive Lead-Based Paint Awareness training annually; and
  3. Ensure that paint used contains less than 0.06% lead, which is considered lead-free by the CPSC.

E. Supervisors shall:

1. Assure that all employees who have a potential to be exposed to lead have received the appropriate training;
2. Ensure that all employees who will perform abatement to lead-based paint have completed training through an approved lead abatement worker class;
3. Assure that employees under their control follow the lead-based paint work practices described in this program;
4. Arrange for exposure monitoring through DES where needed to document exposure levels or provide negative exposure assessments;
5. Initiate medical surveillance for any employee who has the potential for exposure to lead as outlined in 29 CFR 1910.1025 or 29 CFR 1926.62;
6. Coordinate assessment of materials to determine lead content as necessary to determine exposure potential; and
7. Report any problem associated with implementation of the Lead Management Plan in the work area to DES.

F. Employees shall:

1. Perform his/her work as safely as possible and follow all safety procedures;
2. Comply with the provisions of the Lead Management Plan and work practices identified for individual tasks; and
3. Report existing health or safety hazards to the supervisor

## Glossary of Terms

**Abatement:** A set of measures designed to eliminate or reduce lead-based paint hazards in residential, public, or commercial buildings, bridges, or other structures or superstructures in accordance with standards established by the Maryland Department of the Environment (MDE), which may include: (a) the removal of lead-based paint and lead-contaminated dust, the containment or encapsulation of lead-based paint, the replacement or demolition of lead-painted surfaces or fixtures, and the removal or covering of lead-contaminated soil; and (b) all preparation, cleanup, disposal, and post-abatement clearance testing activities associated with these measures.

**Accreditation:** Recognition by MDE that a contractor, supervisor, inspector, risk assessor, or training provider is in compliance with the applicable requirements of working with lead-based paint.

**Action level (AL):** Employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air ( $30 \mu\text{g}/\text{m}^3$ ) calculated as an 8-hour time weighted average (TWA).

**Construction Work:** Work for construction, alteration and/or repair, including painting and decorating. Construction includes, but is not limited to:

- Demolition or salvage of structures where lead or materials containing lead are present;
- Removal or encapsulation of materials containing lead;
- New construction, alteration, repair, or renovation of structures, substrates, or portions or materials containing lead;
- Installation of products containing lead;
- Lead contamination from emergency cleanup;
- Transportation, disposal, storage, or containment of lead or materials containing lead where construction activities are performed; and
- Maintenance operations associated with these construction activities.

**Exposure Assessment:** The initial determination to find if any employee may be exposed to lead at or above the action level. Until the assessment is completed, employees shall assume that the exposure is above the PEL, but not more than ten times the PEL. Employee protective measures shall be implemented, including respiratory, other personal protective equipment, change areas, hand washing facilities, biological monitoring, and training.

**HEPA:** High Efficiency Particulate Air. A filtering system capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 micron in diameter or larger.

**Large Scale Interior and Exterior Maintenance:** The repainting of an interior or exterior area that involves the disturbance of large areas of lead-based paint or multiple surfaces containing lead.

**Lead-based paint (LBP):** any paint, plaster, or other surface encapsulation material containing more than 0.50 percent lead by weight calculated as lead metal in the dried solid, or more than 0.7 milligram per square centimeter.

**Lead-contaminated dust:** Dust with a lead content equal to or greater than: (a) 200 micrograms per square foot ( $\mu\text{g}/\text{ft}^2$ ) in dust collected from a floor; (b)  $500 \mu\text{g}/\text{ft}^2$  in dust collected from a window sill; or (c)  $800 \mu\text{g}/\text{ft}^2$  in dust collected from a window well (trough).

**Lead-free:** (Applies to building condition assessments only. O&M work may require exposure monitoring even if the lead based paint is below the LBP definition ). Means (except for factory-applied coatings on metal components) contains no lead-based paint; or meeting all of the following conditions:

- (a) All interior surfaces of the affected property contain no LBP;
- (b) All exterior surfaces of the affected property coated with LBP that were chipping, peeling, or flaking have been restored without lead-based paint;
- (c) No exterior surfaces of the affected property coated with LBP are chipping, peeling, or flaking; and
- (d) The owner of an affected property submits to MDE, every two years, a certification by an accredited lead paint inspection contractor that no exterior painted surface containing LBP is chipping, peeling, or flaking.

**Lead paint maintenance and repainting:** In-place management or interim control of a lead containing substance including, but not limited to, the following activities: (a) removal of loose, chipping, or peeling paint; (b) limited replacement or repair of defective components or other substrates; (c) the removal and replacement of windows and related trim; or (d) other measures to prepare lead paint for recoating with a lead-free product, encapsulation, or enclosure.

**Lead paint removal and demolition:** A service that involves the stripping or other removal of a lead containing substance from a coated surface, or the removal or demolition of components coated with a lead-containing substance, excluding steel structures.

**Medical Removal Protection:** The removal of an employee from exposure to lead when the employee's blood lead level is at or above 50 micrograms per deciliter of blood ( $\mu\text{g}/\text{dl}$ ).

**O & M:** Operations and Maintenance

**Permissible Exposure Limit (PEL):** The OSHA limit for lead exposure. It is  $50 \mu\text{g}/\text{m}^3$ , averaged over an 8-hour workday, commonly referred to as the Time-Weighted Average, or TWA.

**Project Manager:** A person in Facilities Management O&M or Facilities Management Capital Projects who manages large scale projects and is responsible for ensuring that the contractor conforms to all applicable codes and regulations including, but not limited to, LBP.

**Residential building:** A privately or publicly owned structure, including a house, apartment building, rooming house, hotel, motel, or hospital, which may serve as a permanent or temporary domicile.

**Shoe Mold:** Strips off quarter round wood commonly used where baseboards meet the floor.

**$\mu\text{g}/\text{dl}$ :** Micrograms per deciliter. A deciliter is 10 milliliters or 10 cubic centimeters.

**XRF:** X-Ray Fluorescence analyzer. A device that measures the lead content in paint and other materials. Readings are expressed in milligrams of lead per square centimeter ( $\text{mg}/\text{cm}^2$ ).

## Applicable Regulations

In the State of Maryland, lead is regulated under the following statutes:

For University employees exposed to lead during routine O&M, the University is required to follow OSHA 29 CFR 1910.1025, Occupational Exposure to Lead. If the work is characterized as construction, then University employees are required to follow OSHA 29 CFR 1926.62, Occupational Exposure to Lead in Construction Work. Construction work is defined in the Standard as "construction, alteration, or repair, or all of the above, including but not limited to, renovation, demolition, reconstruction, refurbishing, restoration, painting, and decorating".

Both regulations are essentially similar, except for training requirements.

In OSHA 29 CFR 1910.1025, if employees have a potential to be exposed to lead at any level, they must be informed of Appendix A and B of the Standard. In OSHA 29 CFR 1926.62, the training requirements make reference to OSHA's Hazard Communication Standard for the Construction Industry, 29 CFR 1926.59. In addition, OSHA 29 CFR 1926.62 requires a training program for all employees who are subject to exposure to lead at or above the action level on any day or who are subject to exposure to lead compounds which may cause skin or eye irritation (for example, lead arsenate and lead azide).

For lead-based paint abatement, the Maryland Department of the Environment (MDE) has promulgated COMAR 26.02.07, Procedures for Abating Lead Containing Substances from Buildings.

Lead-based paint abatement is a complex, requirements driven operation, and is only performed by trained and qualified personnel.

Performance of maintenance, repair, or renovation work that results in disturbances of a lead-containing substance is excluded from the MDE regulations above if:

- The disturbance of a lead-containing substance is associated with plumbing or electrical work that involves 3 square feet or less of surface area in a room; or
- Other disturbances of a lead-containing substance involving 3 square feet of surface area in a room, except for window removal or replacement.

Employees must still follow either OSHA 29 CFR 1926.62, Exposure to Lead in Construction or 29 CFR 1910.1025, Occupational Exposure to Lead.

Facilities Management shall assure that contractors engaged in the refinishing of exterior wood surfaces which contain lead-based paint shall follow Section 02091, Surface Preparation for Lead-Based Paint.

Other environmental, health, and safety regulations, and codes and standards that may be applicable include:

- Environmental Protection Agency (EPA) 40 CFR Parts 260-265 and 268, Resource Conservation and Recovery Act (RCRA).

- 
- Maryland Department of the Environment (MDE) Code of Maryland Regulations (COMAR) Title 26, Subtitle 13, Hazardous Waste Regulations Maryland Department of the Environment (MDE) Code of Maryland Regulations (COMAR) Title 26.16.01, Accreditation and Training for Lead Paint Abatement Services.
  - Federal Department of Transportation (DOT) Hazardous Substances Title 49 CFR Parts 171-177.

Guidance documents on lead include:

- National Institute of Building Sciences, Lead-Based Paint Operations and Maintenance Work Practices Manual.
- Department of Housing and Urban Development (HUD), Guidelines for the Evaluation and Control of Lead-Based Paint Hazards (2012 edition)

## Assessment of Conditions

There are certain procedures to be followed when determining the existence of lead and lead-based paint and assessing the risk to employees and /or building occupants. The following situations may initiate the need for assessment:

Lead exposure from normal maintenance work, which might include lead containing materials such as solder or lead-based paint, and which falls under OSHA 29 CFR 1926.62, will be initially monitored to assess employee exposure levels. Depending on the exposure levels, steps as specified in OSHA 29 CFR 1926.62 will be taken. Lead determination in materials such as solder may be based on material safety data sheet (MSDS)/Safety Data Sheet (SDS) information. If MSDS/SDS is not available, lead exposure may be estimated from past assessments. For lead-based paint, use the methods specified under Monitoring and Sampling. In reference to abatement of lead-based paint, assessments may be made:

- At the discretion of the Project Manager, or other designated University representative;
- When proposed maintenance work may expose building occupants and/or residents to lead-containing paint and/or dust;
- When elevated blood lead levels are reported in employees or building occupants/residents;
- When an employee or building occupant experiences symptoms which are indicative of lead poisoning;
- When performing risk assessment activities in University owned buildings;
- When specifically requested by a representative of the Maryland Department of the Environment or other appropriate state agency; and
- When developing the program and/or scope of work for the planned renovation of an existing facility.

## Monitoring and Sampling

This section covers lead-based paint abatement. For construction and renovation monitoring and sampling, refer to the previous section, Assessment of Conditions.

Generally, buildings constructed after 1978 can be assumed to be lead-free. For buildings constructed prior to 1978, lead-based paint assessments must be performed for any surface that will be disturbed and is suspected of containing lead-based paint except where it is documented that the building received a complete interior renovation after all interior components were demolished and removed from the structure. Lead-based paint located under newer coatings must also be identified. The assessment may use any of the following methods:

- Referencing existing building surveys, construction notes or as-built drawings may be used where the surfaces involved are referenced. Renovation file notes and updated drawings may be used to identify surface replacements.
- Substrate testing using an XRF in-paint analyzer or by collecting a sample of the intact paint and submitting it to an accredited laboratory for lead analysis.
- Dust wipe tests.
- Lead testing on the windows and floors on surfaces in question.
- Visual inspection of condition of paint.
- Soil tests for lead contamination.

If a lead-based paint inventory exists for the surfaces involved in the work, Project Managers shall refer to the inventory for the location of lead-based paint. If an inventory does not exist, and the building was constructed or renovated prior to 1980, substrate testing will be required to ascertain the existence of lead-based paint. If possible, reference should be made to as-built drawings to ascertain the location of lead-based painted structures.

### **X-ray Fluorescence (XRF)**

XRF is used to identify lead content of flat surfaces. It is the sampling method of choice because it is accurate, results are immediate, and replaces the time-consuming method of obtaining a paint chip sample and analyzing it in a laboratory. Direct reading XRFs provide the operator with a readout of lead concentration in paint in terms of lead per square centimeter ( $\text{cm}^2$ ).

Before an XRF is used, the technician shall have passed an instructional seminar demonstrating the correct use of the instrument. Since the instrument uses a radioactive source, all UM technicians must shall be entered in the UM Radiation Safety Program.

In the State of Maryland, readings greater than  $0.7 \text{ mg/cm}^2$  indicate the presence of lead. For example, if a reading is  $0.7 \text{ mg/cm}^2$ , it is not over the limit set by Maryland.

### **Paint Chip Sampling**

Paint chip sampling may be used to:

- Clarify an inconclusive XRF result.
- Test a surface that does not lend itself to XRF instrumentation, as defined by the instrument's manufacturer (for example, moldings, windows, playground equipment, and other surfaces that are not flat).

- Determine the percent of lead to identify material that must be disposed as a hazardous waste. (However, the material must be tested according to Toxicity Characteristic Leaching Procedures (TCLP).

### **Spot Testing Using Sodium Rhodonzonate (Lead Swabs)**

This method is not intended to measure the concentration of lead but to determine if lead is present. A color change as specified in the test kit directions (i.e., pink) indicates the likely presence of lead paint. The test can alert the user to the presence of lead in paint so that proper precautions can be taken while removing it. If when using this type of spot testing no color change occurs, this should not be interpreted as the absence of lead.

Accordingly, before concluding an area or surface does not contain lead-based paint, XRF or paint chip sampling is required.

Any lead swab test kit used must be EPA approved.

### **Surface Wipe Testing**

Surface Wipe Testing may be required under the following conditions:

- To perform a risk assessment of UM buildings, such as residential or day care centers, particularly those buildings which are occupied by young children;
- To determine the effectiveness of work practices and/or decontamination activities.

Wipe samples for clearance will be conducted when required by regulation, where required by the Project Manager in consultation with Environmental Safety, or by contract specification. Samples will be in accordance with procedures contained in Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, Appendix 13.1: Wipe Sampling of Settled Lead-Contaminated Dust. Samples may be taken by the Department of Environmental Safety, by an outside contractor or by representatives of Engineering and Architectural Service's contract Industrial Hygiene Consultant.

### **Soil Sampling**

Soil samples may be collected to determine lead concentration of soil surrounding University buildings when determined by regulation, where required by the Project Manager in consultation with Environmental Safety, or by contract specification. Refer to the methods specified in Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, Appendix 13.3: Collecting Samples for Lead Contamination for more information.

---

## **Selection of Units and Locations within Units for Lead-Based Paint Testing**

Large-scale lead-based paint inspections are usually performed by a contractor to determine whether lead is present in a house, dwelling unit, a residential building, or other building and if present, to identify which building components contain lead. Where O&M work involving a wall, window, or other surface is going to be performed, the assessment can be performed by a qualified University employee. Since exposure is based on the amount of lead present and the specific operation, an assessment should be performed for each operation. See Appendix B for a list of operations that have been assessed, described as de minimus, and do not require controls.

This list will be updated as additional tasks are assessed.

When selecting units for assessment, a systematic approach should be used. Generally, each room's components should be tested. A component is defined as a door, wall, molding, window sash and trim, ceiling, stairs or other component. A standardized inspection record containing the following minimum information is to be completed as components are checked. This information will include: sample identification number, substrate, component, test location, XRF reading, result, classification (positive, negative, or inconclusive), laboratory result, units ( $\text{mg}/\text{cm}^2$ , %), and final classification. Areas that are not able to be tested with the XRF due to surface configuration may be sampled using the paint chip method.

When testing multiple units, only the project manager or DES will determine which components will be tested. Protocols for lead-based paint inspection used at the University can be found in the HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, Chapter 7.

A record of the results of all lead paint testing shall be maintained by the campus department responsible for the overall maintenance of each facility. In addition, a copy of all test results should be forwarded to the Department of Environmental Safety.

---

## Exposure Monitoring

Exposure monitoring should be conducted for maintenance activities involving the disturbance of lead-based paint, unless the same type of job has been assessed previously. In this case, a review of the previous assessment can be used to decide if additional monitoring is necessary. The University may use the services of the Department of Environmental Safety.

### **Exposure Monitoring**

If the assessment determines that lead exposure should be monitored, personal exposure monitoring may be conducted. Monitoring and sampling and analysis will be performed in accordance with NIOSH Method 7082, LEAD by Flame AAS. Analysis will be conducted by an American Industrial Hygiene Association accredited laboratory. Results in excess of the Action Level (AL) will require additional employee protection measures in accordance with either OSHA 29 CFR 1926.62 or OSHA 29 CFR 1910.1025, depending how the work is classified, that is, construction or general industry.

Exposure monitoring will be performed by a representative of the Department of Environmental Safety for maintenance work performed by University employees. Exposure monitoring for private contractors' employees will be performed by an independent industrial hygiene consultant coordinated by the Project Manager.

As required by the Project Manager, area samples may be taken during large scale maintenance work to determine if lead particulates are infiltrating into occupied spaces. Sampling and analysis will be performed as described above. Results in excess of the AL of  $30 \mu\text{g}/\text{m}^3$  will require additional employee protection measures as outlined in Personal Hygiene Practices, Respiratory Protection, and Appendix D of this Plan.

Copies of the results of all industrial hygiene monitoring must be forwarded to the Department of Environmental Safety.

Affected employees must be notified in accordance with applicable regulations.

# Training

## Lead Awareness

Where there is a potential exposure to airborne lead at any level, and the work is classified as repair or maintenance, and not construction, the employee must be informed of the contents of 29 CFR 1910.1025 Appendix A (Substance Data Sheet for Occupational Exposure to Lead) and Appendix B (Employee Standard Summary) and shall be trained of the following information:

- Health hazards associated with lead exposure;
- Lead routes of entry;
- Locations of lead materials and lead-based paint on campus;
- Approved methods of working with lead-based paint; and
- Lead hazards around the home

This information transmission must be repeated at least annually for each employee. The OSHA Lead in Construction Standard, 29 CFR 1926.62, does not require lead awareness training.

## Lead-Worker Training

OSHA 29 CFR 1910.1025 and 1926.62 require that an employee health and safety program be implemented for all employees involved in the disturbance (e.g., sanding, planning, scraping, etc.) of lead-based paint and who are exposed to lead in excess of 30 ug/m<sup>3</sup> on any day during a given year. They must attend Lead Worker Training. Departments in consultation with the Department of Environmental Safety will identify the specific individuals/positions involved so that exposure assessment can be performed.

All costs associated with training, protective equipment, and medical monitoring provided to campus employees will be assumed by the employee's department.

Training must be repeated each year that the employee may have such an exposure. This category would include employees who have the potential to disturb lead-bearing paint in the course of normal activities such as carpenters, painters and plumbers who use lead containing solders. DES will provide, as requested, the training. It will consist of:

- The hazards associated with lead;
- Employee information concerning sources of lead, including warning labels, signs and material safety data sheets (MSDS);
- Content of the Lead Standard, either General Industry or Construction, whichever is applicable;
- Specific nature of the operations which could result in exposure to lead above the action level;
- Purpose, proper selection, fitting, use and limitations of respirators;
- Purpose and description of the medical surveillance and medical removal programs, including health effects of lead exposure and potential reproductive consequences.
- Engineering controls and work practices for lead-related work;
- Content of this Plan;
- Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician; and
- Employee's right of access to records under 29 CFR 1910.20.

**Lead-Paint Abatement Worker Training** (Note: All Abatement training is driven by COMAR 26.16.01, Accreditation and Training for Lead Paint Abatement Services)

All employees involved in the abatement of lead-based paint must attend a **7-hour** Maryland Department of the Environment (MDE) approved hands-on training course and pass the exam.

Abatement means a set of measures designed to eliminate or reduce lead-based paint hazards. The course must be repeated every three years.

**Lead-Paint Abatement Project Supervisor**

All employees who will supervise employees performing a lead-based paint abatement must attend a **28-hour, 4-day** Maryland Department of the Environment approved initial lead-paint abatement supervisors course and have at least 2 years of experience in related construction trades, including but not limited to lead paint abatement, carpentry, painting, or demolition. A **7-hour** refresher course will be required every 2 years.

**Lead-Paint Abatement Project Supervisor - Maintenance and Repainting** (Involving Abatement/Removal Only)

All employees who will only supervise maintenance and repainting projects must complete a **14-hour, 2-day** Maryland Department of the Environment approved initial lead-based paint supervisors course and at least 6 months of professional experience as a carpenter, painter or other skilled construction trade. A **7-hour** refresher course will be required every 2 years for both certifications.

**Lead-Paint Abatement Project Designer**

All employees who will design a lead-based paint removal or remediation project must attend a **35-hour** Maryland Department of the Environment approved initial Project Designer course. A **7-hour** refresher course will be required every 2 years.

**Lead Paint Inspector/Risk Assessor**

All employees who will identify and measure the lead content in paint must complete a **21-hour** Maryland Department of the Environment approved initial lead paint inspector technician course. An additional **14-hours** of instruction are required for individuals who want to qualify as Risk Assessors. A **7-hour** refresher course will be required every 2 years for both certifications.

## Medical Surveillance

In accordance with OSHA 29 CFR 1910.25 and 1926.62, employees who are performing construction work and are occupationally exposed on any day to lead at or above the AL, shall have initial medical surveillance consisting of biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin (ZPP) levels. This will be provided through the University Health Center Occupational Health Unit. Additionally, employees who are or may be exposed at or above the AL for more than 30 days in any consecutive 12 months will be offered the following medical surveillance:

- Blood sampling and analysis at least every 2 months for the first 6 months and every 6 months thereafter;
- Workers with blood lead levels at or above 40 µg/dl will have a blood test at least every two (2) months until two (2) consecutive tests (a week apart) show levels less than 40 µg/dl;
- If an employee is medically removed due to elevated blood lead levels, a second (followup) blood sampling must be performed within two weeks after the employer receives the results of the first test; and,
- Blood tested upon termination of employment.

A ZPP is required on each occasion that a blood lead level measurement is made.

Employees will receive the confidential results of blood tests through the Occupational Health Unit.

All medical records remain confidential unless the employee grants permission for his/her records to be released. However, the employee's supervisor and the Department of Environmental Safety will both be notified of an employee's fitness to continue performing lead work and in the event of an employee's blood lead level exceeds 40 µg/dl so that the employee may be moved or transferred to another area until blood lead levels decrease as verified through subsequent blood testing. Environmental Safety will investigate the work practices used to determine why the employee's blood tested high for lead.

In accordance with OSHA 29 CFR 1910.1025, employees not working in construction shall have medical surveillance if they are exposed above the AL for more than 30 days per year.

Employees will be offered the following medical surveillance:

- Blood lead and ZPP analysis shall be performed at least every 6 months.
- At least every 2 months for each employee whose last blood sampling and analysis indicated a blood lead level at or above 40 µg/dl of whole blood.
- The frequency shall continue until two consecutive blood samples and analyses indicate a blood lead level below 40 µg/dl of whole blood.
- At least monthly during the removal period of each employee removed from exposure to lead due to an elevated blood lead level.
- Whenever the results of a blood lead test indicate that an employee's blood lead level is at or above 60 µg/dl and the employee is exposed to lead at or above the action level, the employer shall provide a second (follow-up) blood sampling test within two weeks after the employer receives the results of the first blood sampling test.

### Medical Consultation

A medical examination shall be provided to each person enrolled in the lead medical surveillance program if at any time the individual experiences symptoms consistent with lead intoxication, needs

consultation concerning the potential effects of past lead exposure or on the ability to procreate or carry a healthy child, or has difficulty breathing during fit-testing or the use of a respirator. The examination shall be conducted annually for any individual who has had a blood-lead level of 40 µg/dl or greater or has been medically removed in the past 12 months. The content of the physical exam shall be at the discretion of the attending physician but shall include at a minimum the elements listed in OSHA 29 CFR 1926.62 (j) (3) for construction workers or OSHA 29 CFR 1910.1025 (j)(3) for workers not involved in construction.

### **Enrollment Information**

The supervisor must provide the Occupational Health Unit with the following information with each new employee enrolled:

- A description of the affected employees duties as related to potential lead exposure;
- The employees anticipated exposure level to lead and other toxic substances (if applicable); and
- A description of personal protective equipment to be used.

The employee must provide the attending physician with prior blood lead determinations and written medical opinions related to lead exposure.

If a second opinion is sought from a physician outside of the University Health Center, a copy of Appendix I, 1926.62 must be provided to the physician along with a copy of the patients lead related history by the Occupational Health Unit.

### **Chelation**

OSHA prohibits prophylactic chelation except by a licensed physician and conducted in a clinical setting with thorough and appropriate medical monitoring. The employee must be notified by the Occupational Health Unit in writing prior to its occurrence. (External physicians must notify the employee and the Occupational Health Unit).

### **Medical Removal Protection**

Any employee who has a blood lead level of 50 µg/dl or more shall be excluded from work with potential for lead exposure until the employee has had two (2) consecutive blood samples at or below 40µg/dl.

An employee may also be excluded from lead-related work when written results of a medical consultation determine that the employee may be at increased risk of impairment to the employees' health from exposure to lead. The employee may return to former duties upon receipt of a written opinion from the consulting physician that the conditions placing the employee at increased risk are no longer present or of material concern.

---

Where the employee is unable to return to normal duties within 18 months, the Occupational Health Unit shall make a final determination based upon the employees medical evaluation identifying conditions that could allow an employee to safely return to work or a final medical determination that the employee is incapable of ever safely returning to work. In the event that the employee is found incapable of performing lead-related work, the employee's department shall attempt to find an alternate job assignment in the employee's job classification that does not have lead exposure. In the event that no acceptable alternate assignment can be found, the employee's options shall be reviewed. These may include disability retirement, termination, or other options as determined by Personnel Services.

---

## **Personal Hygiene Practices**

UM recognizes that even when airborne lead exposure levels are low, the potential exists for significant lead ingestion due to poor personal hygiene practices. No eating, drinking, application of cosmetics (including lip balm) or smoking is permitted at work sites where lead and lead-based paints are being disturbed. Workers shall wash their hands, arms and faces prior to eating, drinking, applying cosmetics or smoking.

When chemical strippers are used to remove lead-based paint, appropriate impermeable gloves and chemical resistant clothing shall be worn for worker protection as well as safety goggles or face shields to protect the eyes from chemical splashes. Portable eye wash equipment must be available on site, if applicable. The area where the chemical stripper is being used must be well ventilated to avoid exposure to potentially toxic vapors.

# Respiratory Protection

Workers engaged in lead work will require respiratory protective equipment when industrial hygiene air monitoring indicates anticipated exposures in excess of the PEL.

The use of respiratory protection shall be in accordance with OSHA 29 CFR 1910.134, Respiratory Protection, and UM's Respiratory Protection Program. All workers must be medically evaluated by the Occupational Health Unit to determine the ability of the worker to perform the work while wearing a respirator. Training in the care, use and fitting of the respirator in addition to fit-testing is conducted by DES for those employees who are authorized by Occupational Health Unit to wear a respirator. Any worker who is not authorized by the Occupational Health Unit to wear a respirator will be prohibited from engaging in activities which may expose the worker to airborne lead if exposures are anticipated to exceed the OSHA permissible exposure level.

All employee respirators worn at the work site must be placed in a plastic bag prior to leaving the site and thoroughly cleaned before being worn again. Cleaning should include inspection of the respirator and replacement of worn parts. Fit-checks should be done each time the respirator is worn. The medical exam, fit-test and training must be repeated annually.

Respirators shall be selected as follows:

<b>Airborne concentration of lead</b>	<b>Required respirator<sup>1</sup></b>
Not in excess of 50 µg/m <sup>3</sup>	Half-mask air-purifying respirator equipped with high efficiency filter <sup>2,3</sup> .
Not in excess of 250 µg/m <sup>3</sup>	Full facepiece, air-purifying respirator with high efficiency filters <sup>3</sup> .
Not in excess of 500 µg/m <sup>3</sup>	(1) Any powered, air-purifying respirator with high efficiency filters <sup>3</sup> ; or (2) Half-mask supplied-air respirator operated in positive-pressure mode <sup>2</sup> .
Not in excess of 1000 µg/m <sup>3</sup>	Supplied-air respirators with full facepiece, hood, helmet, or suit, operated in positive pressure mode.
Greater than 1000 µg/m <sup>3</sup> , unknown concentration or fire fighting	Full facepiece, self-contained breathing apparatus operated in positive-pressure mode.

1. Respirators specified for higher concentrations can be used at lower concentrations of lead.
2. Full facepiece is required if the lead aerosols cause eye or skin irritation at the use concentrations.
3. A high efficiency particulate filter means 99.97 percent efficient against 0.3 micron size particles.

---

## **Occupant Health and Safety**

Disturbance of lead paint surfaces within a building's interior should only occur under proper work controls. Methods of controlling lead exposure to other occupants may include isolating the area by use of plastic sheeting and sealing all ventilation ducts in the area of the work and/or turning off and securing the ventilation system (lockout-tagout). Other methods to minimize distribution of lead dust may include wet sanding and the use of HEPA vacuum cleaners. (See Work Practices Section).

### **Notification to Building Occupants**

Prior to the initiation of any large scale interior or exterior work involving lead-based paint, the Project Manager will forward lead-based paint information to the appropriate department chair or director. This bulletin will contain the general scope of work to be done, dates for the start and proposed completion of the work, and the precautions which will be employed to protect building occupants. This bulletin will also alert staff to the increased hazard that lead contamination may present for pregnant or nursing women. Based on a determination by the Project Manager in consultation with Environmental Safety, further measures to reduce potential lead exposure, will be taken if necessary.

---

## Signage

Warning signs shall be posted at each job site where the employees exposure to lead is above the PEL. Where an exposure assessment has not been completed, signs shall be posted until the results are known. The signs shall consist of the following wording:

**WARNING  
HAZARD  
LEAD WORK AREA  
NO SMOKING, EATING OR DRINKING**

for further information contact (Supervisor's name, location, phone) or the Dept. of Environmental Safety x53960

## Work Practices

Work practices have been divided into 3 categories:

1. Operations and Maintenance (O&M) tasks that have been assessed and do not require any precautions and/or protective measures. (See Appendix B)
2. Operations and Maintenance (O&M) tasks that have not been assessed and may require precautions and/or protective measures. (See Appendix C)
3. Operations and Maintenance (O&M) tasks that may require other precautions and/or protective measures. (NIBS Work Practices) (See Appendix D).

Acceptable Practices (Do's)

- If the condition of an interior or exterior surface (e.g. walls, trim, ceiling, doors, etc.) does not require sanding or scraping prior to repainting, and the surface is in good condition, the surface may be painted even if the paint has not been tested to determine its lead content.
- Doors or other building components which can be removed without disturbing the painted surface can be removed without the use of any special protection or requirements. The disposal of these items if found to contain lead must be disposed of according to the requirements specified in the Waste Disposal Section.
- If air monitoring has not been performed to characterize the job, it should be performed at the start of the job.
- If a lead-based painted surface is flaking or peeling, the loose paint may be removed using wet scraping. This involves wetting the surface to be scraped (in addition to the scraping tool) with water during the entire process.
- If an interior surface must be scraped, the area will be vacated of all occupants prior to the initiation of any work and all furnishings shall be removed from the area or covered with 6 mil plastic, the floor covered with 6 mil plastic and the area secured to limit access. For exterior scraping, windows and doors in the immediate area should remain closed and secured until the preparation and required cleanup is complete.
- Window sills and the floor beneath it in residential buildings should be HEPA vacuumed, washed with trisodium phosphate (TSP) and re-vacuumed following any LBP work
- When dust or debris from a window or other opening may contaminate an exterior area, 6 mil plastic sheeting must be securely fastened to the ground next to the work area. The ground should be covered and weighted with sheeting at least five (5) feet from the side of the building and extend three (3) feet per story being abated.
- Employees involved shall wear protective clothing as described in Personal Hygiene Practices, Page 18.
- Return air vents in the room or immediate area shall be covered.
- Debris and contaminated clothing shall be collected, placed in 4-mil plastic bags and disposed according to Waste Management practices. Debris should be sprayed with water prior to sweeping and placed in 4-mil plastic bags. A HEPA vacuum should be used to remove any visible dust from interior/exterior surfaces.

Unacceptable Practices (Don'ts)

- Dry sanding.
- Allowing dust to become airborne.
- Circulating dust through the ventilation system.
- Lead contamination of the floor/ground surrounding the work.

---

### **Large Scale Interior and Exterior Maintenance**

Where the repainting of an interior or exterior area of damaged and/or deteriorated LBP would involve the disturbance of large areas or multiple surfaces, and would be performed by UM employees, departments must contact DES to review the scope of work and develop specific protective measures. LBP work cannot be initiated until an agreed upon plan of action specifying work methods, required employee training and occupant protection, and testing requirements are defined and implemented. Where LBP work is contracted out, see Contract Work below.

### **Contract Work**

All specifications for work associated with LBP to be performed by contractors will be reviewed by Facilities Management Capital Projects, or Facilities Management (O&M) and DES. Departments responsible for proposing LBP associated work must forward the draft specifications to Capital Projects/Facilities Management (O&M) in advance of requesting proposals from contractors to ensure LBP requirements are included in the requests.

## OSHA Recordkeeping

In accordance with OSHA 29 CFR 1910.20, 1910.1025, and 1926.62, the following records must be kept by DES for at least 30 years:

- exposure assessments and monitoring;
- a description of the sampling and analytical methods used;
- the type of respiratory protective devices worn; and,
- name, University id number, and job classification of the employee monitored.

For respiratory protection fit testing tests, refer to the university's Respiratory Protection Program. In addition, the following medical records must be kept by the Occupational Health Unit for employees subject to medical surveillance for at least 30 years:

- name, University id number, and description of the duties of the employee;
- a copy of the physician's written opinions;
- results of any airborne exposure monitoring done on or for that employee and provided to the physician; and,
- any employee medical complaints related to exposure to lead.

In addition, Occupational Health Unit must keep the following medical records for at least 30 years:

- a copy of the medical examination results including medical and work history required under OSHA 1926.62 (j);
- a description of the laboratory procedures and a copy of any standards or guidelines used to interpret the test results or references to that information;
- a copy of the results of biological monitoring.

If the employee was removed from lead work under the medical removal provisions, the following records must be maintained by the Occupational Health Unit for at least the duration of the employee's employment:

- the name and University ID number of the employee;
- the date of each occasion that the employee was removed from current exposure to lead as well as the corresponding date on which the employee was returned to his or her former job status;
- a brief explanation of how each removal was or is being accomplished;
- a statement with respect to each removal indicating whether or not the reason for the removal was an elevated lead level.

Other information, such as ongoing maintenance and renovation activities, wipe tests, air sampling and lead paint surveys, conducted on campus by other groups, shall be kept by Capital Projects/Facilities Management.

# Waste Disposal Requirements

All disposal of lead-contaminated waste is handled by DES. This section describes the segregation, packing, labeling, and management of these waste materials generated by work on University property.

## Identification of Hazardous Materials

The following materials shall be managed as lead-contaminated hazardous waste for disposal:

- Lead paint chips, flakes and dusts removed by the contractor;
- Large-scale polyethylene material and masking tape;
- Lead-contaminated miscellaneous disposable tools, brushes, wipes, etc.;
- Lead-contaminated miscellaneous disposable personal protective equipment;
- Lead-contaminated paint remover compound (with material safety data sheet for identification);
- Lead-contaminated paint remover neutralizer (with material safety data sheet for identification);
- Lead contaminated paint rinse water;
- Lead-contaminated paint drop cloths to collect lead contaminated material;
- Lead contaminated caulking or glazing compounds.

## Packaging

The University shall provide approved drums, drum liners, containers, and labels required for the proper disposal of hazardous materials. Contractors shall provide the plastic bags to contain the hazardous material.

The Contractor shall be responsible for the pickup and delivery of DOT approved containers for each job site.

Packaging material will be available for pickup at the University of Maryland Environmental Services Facility (Building 344) between the hours of 8:30 a.m. and 4:00 p.m., Monday through Friday (except on University holidays). The Contractor shall inform Environmental Services Facility personnel what type of waste the Contractor will be generating to obtain the proper containers and labels.

The Contractor shall insure that all hazardous material is packaged and segregated according to the following parameters:

- Removed abatement compounds, including cloth and paint, shall be placed in a plastic bag(s) meeting the following requirements:

Hazardous material, e.g., lead paint chips, will be placed in an approved DOT drum and drum liner provided by the University.

Each drum shall be filled to capacity with two (2) inches of head space and sealed by installing a gasket and locking ring.

Drums containing hazardous waste may be moved from job site to job site on campus until filled. The Contractor is prohibited from transporting the drum off University roads to public roads without the approval of the supervisor of the Project Manager for the project(s).

- Liquid material (neutralizer and contaminated rinse water) shall be placed in a DOT approved container provided by the University, filled to capacity and sealed with drum bung.
- Contaminated personal protective equipment, polyethylene material, and miscellaneous tools shall be bagged and placed in a container provided by the University. Placing these items in a container with removed abatement compounds is prohibited.

The Contractor shall properly seal and keep the hazardous material container sealed during storage, except when it is necessary to add or remove hazardous material.

The mixture of municipal waste, i.e., food packaging and beverage containers, and hazardous materials is prohibited.

### **Labeling**

The University will provide appropriate label(s) for hazardous material containers. The label(s) will be affixed to the side of the container when the hazardous material is first placed in the container and the label(s) will be affixed so that they are within three inches of each other.

### **Marking**

The Contractor shall be responsible for the proper marking of each hazardous material container according to the following:

- 1) Hazardous Waste Markings
  - a) The Contractor will place the date in the designated area on the hazardous waste label when the hazardous material was placed in the container.
  - b) The Contractor will place the Proper Shipping Name, listed below, in the designated area on the label according to the following:
    - 1) Lead Paint Solids - Hazardous Waste Solid, N.O.S. / 9 / NA 3077/ PG III (D008)
    - 2) Peel-Away Solids - Hazardous Waste Solid, N.O.S. / 9 / NA 3077/ PG III (D008)
    - 3) Liquid Paints - Waste Paint Related Material / 3 / UN 1263 / PG II
    - 4) Paint Rinsate - Waste Caustic Alkali Liquids, N.O.S. / 8 / UN 1719/ PG II / (D002, D008)
    - 5) Lead Paint Chips & Soil - Hazardous Waste Solid, N.O.S. / 9 / NA 3077/ PG III (D008)
    - 6) Miscellaneous Equipment Contaminated with Lead - Hazardous Waste Solid, N.O.S. / 9 / NA 3077/ PG III (D008)
- 2) University of Maryland Project Information
  - a) The University's Project Number will be placed on the hazardous waste label in the upper of right hand corner with a permanent marker.
  - b) The University's Contract Number will be placed on the hazardous waste label in the upper of right hand corner with a permanent marker.
  - c) The University's Contract User/Agency (e.g., "Residential Facilities") will be placed on the hazardous waste label in the upper of right hand corner with a permanent marker.

### **Security and Temporary Storage**

The Contractor may temporary store the hazardous material container at the job site, provided that the Contractor complies with the following:

- Fulfills the requirements in Section A through Section E of this subsection;

- Ensures that all required labels and markings can be visually seen from a distance or without moving the container;
- Provides security of the hazardous material container to prevent the disturbance and physical contact of the waste by unknowing or unauthorized persons or livestock; and
- Removes and delivers the hazardous material container to the Environmental Services Facility within three (3) days of the container reaching its capacity or the completion of the project.

### **Transportation of Waste Material**

Hazardous material generated from a University of Maryland project shall be transported to the Environmental Services Facility, via the roads on the University campus. The transportation of hazardous material on a non-university owned road or thoroughfare is prohibited.

### **Back charges**

The University reserves the right to back charge the Contractor time and materials should the hazardous materials are not handled in a manner consistent with this specification. The segregation, packaging, labeling, and marking of hazardous materials shall comply with appropriate Federal and State regulations.

### **Environmental Protection**

The Contractor agrees to indemnify, hold harmless and defend the University of Maryland System and University of Maryland (the "Indemnities") from and against any and all liabilities, claims, penalties, forfeitures, suits, and the costs and expenses incident thereto (including cost of defense, settlement and attorneys' fees), which the Indemnities, or any on of them, may hereinafter incur, become responsible for or pay as a result of death or bodily injury to any person, destruction or damage to any property, contamination of or adverse effects on the environment, or any violation of governmental laws, regulations or orders to the extent that such damage was caused by: (i) the Contractor's breach of any term or provision of this contract; (ii) the failure of any warranty of the Contractor to be true, accurate and complete; and (iii) any negligent, intentional or willful act or omission of the Contractor, the Contractor's subcontractors or the employees or agents of any of them.

In addition, with respect to any liabilities, claims, penalties, forfeitures, suits or threatened suits, and the cost and expenses incident thereto relating to services under this contract and arising without regard to the fault of the Contractor, its subcontractors, their employees or agents, or one or more of the Indemnities, the Contractor will indemnify the University of Maryland System and the Indemnities for their costs, including cost of defense, settlement and reasonable attorney's fees. Without limitation, the foregoing sentence will apply to any governmentally imposed or privately negotiated Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response costs and related expenses.

---

## **MDE Notification**

For residential buildings, prior to the initiation of any abatement work which will disturb leadbased paint, the Maryland Department of the Environment must be notified. For abatement work performed by campus personnel, it will be the responsibility of the Project Manager to coordinate notification to MDE through the Department of Environmental Safety. For all contract work, the specifications require the contractor to notify MDE.

---

## **Program Evaluation**

The Lead Management Plan is designed to minimize exposure to lead. This information will be reviewed periodically and updated as necessary.

---

## **Appendix A**

29 CFR 1010.1025, Appendix A&B



**Regulations (Standards - 29 CFR)**

**Substance data sheet for occupational exposure to lead - 1910.1025 App A**

[← Regulations \(Standards - 29 CFR\) - Table of Contents](#)

- **Part Number:** 1910
- **Part Title:** Occupational Safety and Health Standards
- **Subpart:** Z
- **Subpart Title:** Toxic and Hazardous Substances
- **Standard Number:** [1910.1025 App A](#)
- **Title:** Substance data sheet for occupational exposure to lead

## I. SUBSTANCE IDENTIFICATION

A. Substance: Pure lead (Pb) is a heavy metal at room temperature and pressure and is a basic chemical element. It can combine with various other substances to form numerous lead compounds.

B. Compounds Covered by the Standard: The word "lead" when used in this standard means elemental lead, all inorganic lead compounds and a class of organic lead compounds called lead soaps. This standard does not apply to other organic lead compounds.

C. Uses: Exposure to lead occurs in at least 120 different occupations, including primary and secondary lead smelting, lead storage battery manufacturing, lead pigment manufacturing and use, solder manufacturing and use, shipbuilding and ship repairing, auto manufacturing, and printing.

D. Permissible Exposure: The Permissible Exposure Limit (PEL) set by the standard is 50 micrograms of lead per cubic meter of air (50 ug/m<sup>3</sup>), averaged over an 8-hour workday.

E. Action Level: The standard establishes an action level of 30 micrograms per cubic meter of air (30 ug/m<sup>3</sup>), time weighted average, based on an 8-hour work-day. The action level initiates several requirements of the standard, such as exposure monitoring, medical surveillance, and training and education.

## II. HEALTH HAZARD DATA

A. Ways in which lead enters your body. When absorbed into your body in certain doses lead is a toxic substance. The object of the lead standard is to prevent absorption of harmful quantities of lead. The standard is intended to protect you not only from the immediate toxic effects of lead, but also from the serious toxic effects that may not become apparent until years of exposure have passed.

Lead can be absorbed into your body by inhalation (breathing) and ingestion (eating). Lead (except for certain organic lead compounds not covered by the standard, such as tetraethyl lead) is not absorbed through your skin. When lead is scattered in the air as a dust, fume or mist it can be inhaled and absorbed through your lungs and upper respiratory tract. Inhalation of airborne lead is generally the most important source of occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed. If you handle food, cigarettes, chewing tobacco, or make-up which have lead on them or handle them with hands contaminated with lead, this will contribute to ingestion.

A significant portion of the lead that you inhale or ingest gets into your blood stream. Once in your blood stream, lead is circulated throughout your body and stored in various organs and body tissues. Some of this lead is quickly filtered out of your body and excreted, but some remains in the blood and other tissues. As exposure to lead continues, the amount stored in your body will increase if you are absorbing more lead than your body is excreting. Even though you may not be aware of any immediate symptoms of disease, this lead stored in your tissues can be slowly causing irreversible damage, first to individual cells, then to your organs and whole body systems.

B. Effects of overexposure to lead - (1) Short term (acute) overexposure. Lead is a potent, systemic poison that serves no known useful function once absorbed by your body. Taken in large enough doses, lead can kill you in a matter of days. A condition affecting the brain called acute encephalopathy may arise which develops quickly to seizures, coma, and death from cardiorespiratory arrest. A short term dose of lead can lead to acute encephalopathy. Short term occupational exposures of this magnitude are highly unusual, but not impossible. Similar forms of encephalopathy may, however, arise from extended, chronic exposure to lower doses of lead. There is no sharp dividing line between rapidly developing acute effects of lead, and chronic effects which take longer to acquire. Lead adversely affects numerous body systems, and causes forms of health impairment and disease which arise after periods of exposure as short as days or as long as several years.

(2) Long-term (chronic) overexposure. Chronic overexposure to lead may result in severe damage to your blood-forming, nervous, urinary and reproductive systems. Some common symptoms of chronic overexposure include loss of appetite, metallic taste in the mouth, anxiety, constipation, nausea, pallor, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, hyperactivity and colic. In lead colic there may be severe abdominal pain.

Damage to the central nervous system in general and the brain (encephalopathy) in particular is one of the most severe forms of lead poisoning. The most severe, often fatal, form of encephalopathy may be preceded by vomiting, a feeling of dullness progressing to drowsiness and stupor, poor memory, restlessness, irritability, tremor, and convulsions. It may arise suddenly with the onset of seizures, followed by coma, and death. There is a tendency for muscular weakness to develop at the same time. This weakness may progress to paralysis often observed as a characteristic "wrist drop" or "foot drop" and is a manifestation of a disease to the nervous system called peripheral neuropathy.

Chronic overexposure to lead also results in kidney disease with few, if any, symptoms appearing until extensive and most likely permanent kidney damage has occurred. Routine laboratory tests reveal the presence of this kidney disease only after about two-thirds of kidney function is lost. When overt symptoms of urinary dysfunction arise, it is often too late to correct or prevent worsening conditions, and progression to kidney dialysis or death is possible.

Chronic overexposure to lead impairs the reproductive systems of both men and women. Overexposure to lead may result in decreased sex drive, impotence and sterility in men. Lead can alter the structure of sperm cells raising the risk of birth defects. There is evidence of miscarriage and stillbirth in women whose husbands were exposed to lead or who were exposed to lead themselves. Lead exposure also may result in decreased fertility, and abnormal menstrual cycles in women. The course of pregnancy may be adversely affected by exposure to lead since lead crosses the placental barrier and poses risks to developing fetuses. Children born of parents either one of whom were exposed to excess lead levels are more likely to have birth defects, mental retardation, behavioral disorders or die during the first year of childhood.

Overexposure to lead also disrupts the blood-forming system resulting in decreased hemoglobin (the substance in the blood that carries oxygen to the cells) and ultimately anemia. Anemia is characterized by weakness, pallor and fatigability as a result of decreased

oxygen carrying capacity in the blood.

(3) Health protection goals of the standard. Prevention of adverse health effects for most workers from exposure to lead throughout a working lifetime requires that worker blood lead (PbB) levels be maintained at or below forty micrograms per one hundred grams of whole blood (40 ug/100g). The blood lead levels of workers (both male and female workers) who intend to have children should be maintained below 30 ug/100g to minimize adverse reproductive health effects to the parents and to the developing fetus.

The measurement of your blood lead level is the most useful indicator of the amount of lead being absorbed by your body. Blood lead levels (PbB) are most often reported in units of milligrams (mg) or micrograms (ug) of lead (1 mg=1000 ug) per 100 grams (100g), 100 milliliters (100 ml) or deciliter (dl) of blood. These three units are essentially the same. Sometime PbB's are expressed in the form of mg% or ug%. This is a shorthand notation for 100g, 100 ml, or dl.

PbB measurements show the amount of lead circulating in your blood stream, but do not give any information about the amount of lead stored in your various tissues. PbB measurements merely show current absorption of lead, not the effect that lead is having on your body or the effects that past lead exposure may have already caused. Past research into lead-related diseases, however, has focused heavily on associations between PbBs and various diseases. As a result, your PbB is an important indicator of the likelihood that you will gradually acquire a lead-related health impairment or disease.

Once your blood lead level climbs above 40 ug/100g, your risk of disease increases. There is a wide variability of individual response to lead, thus it is difficult to say that a particular PbB in a given person will cause a particular effect. Studies have associated fatal encephalopathy with PbBs as low as 150 ug/100g. Other studies have shown other forms of diseases in some workers with PbBs well below 80 ug/100g. Your PbB is a crucial indicator of the risks to your health, but one other factor is also extremely important. This factor is the length of time you have had elevated PbBs. The longer you have an elevated PbB, the greater the risk that large quantities of lead are being gradually stored in your organs and tissues (body burden). The greater your overall body burden, the greater the chances of substantial permanent damage.

The best way to prevent all forms of lead-related impairments and diseases-both short term and long term- is to maintain your PbB below 40 ug/100g. The provisions of the standard are designed with this end in mind. Your employer has prime responsibility to assure that the provisions of the standard are complied with both by the company and by individual workers. You as a worker, however, also have a responsibility to assist your employer in complying with the standard. You can play a key role in protecting your own health by learning about the lead hazards and their control, learning what the standard requires, following the standard where it governs your own actions, and seeing that your employer complies with provisions governing his actions.

(4) Reporting signs and symptoms of health problems. You should immediately notify your employer if you develop signs or symptoms associated with lead poisoning or if you desire medical advice concerning the effects of current or past exposure to lead on your ability to have a healthy child. You should also notify your employer if you have difficulty breathing during a respirator fit test or while wearing a respirator. In each of these cases your employer must make available to you appropriate medical examinations or consultations. These must be provided at no cost to you and at a reasonable time and place.

The standard contains a procedure whereby you can obtain a second opinion by a physician of your choice if the employer selected the initial physician.



Occupational Safety & Health Administration

We Can Help

What's New | Offices

Home

Workers

Regulations

Enforcement

Data & Statistics

Training

Publications

Newsroom

Small Business



Regulations (Standards - 29 CFR) - Table of Contents

- **Part Number:** 1910
- **Part Title:** Occupational Safety and Health Standards
- **Subpart:** Z
- **Subpart Title:** Toxic and Hazardous Substances
- **Standard Number:** [1910.1025 App B](#)
- **Title:** Employee standard summary

This appendix summarizes key provisions of the standard that you as a worker should become familiar with.

I. PERMISSIBLE EXPOSURE LIMIT (PEL) - PARAGRAPH (C)

The standards sets a permissible exposure limit (PEL) of fifty micrograms of lead per cubic meter of air (50 ug/m(3)), averaged over an 8-hour work-day. This is the highest level of lead in air to which you may be permissibly exposed over an 8-hour workday. Since it is an 8-hour average it permits short exposures above the PEL so long as for each 8-hour work day your average exposure does not exceed the PEL.

This standard recognizes that your daily exposure to lead can extend beyond a typical 8-hour workday as the result of overtime or other alterations in your work schedule. To deal with this, the standard contains a formula which reduces your permissible exposure when you are exposed more than 8 hours. For example, if you are exposed to lead for 10 hours a day, the maximum permitted average exposure would be 40 ug/m(3).

II. EXPOSURE MONITORING - PARAGRAPH (D)

If lead is present in the workplace where you work in any quantity, your employer is required to make an initial determination of whether the action level is exceeded for any employee. This initial determination must include instrument monitoring of the air for the presence of lead and must cover the exposure of a representative number of employees who are reasonably believed to have the highest exposure levels. If your employer has conducted appropriate air sampling for lead in the past year he may use these results. If there have been any employee complaints of symptoms which may be attributable to exposure to lead or if there is any other information or observations which would indicate employee exposure to lead, this must also be considered as part of the initial determination. This initial determination must have been completed by March 31, 1979. If this initial determination shows that a reasonable possibility exists that any employee may be exposed, without regard to respirators, over the action level (30 ug/m(3)) your employer must set up an air monitoring program to determine the exposure level of every employee exposed to lead at your workplace.

In carrying out this air monitoring program, your employer is not required to monitor the exposure of every employee, but he must monitor a representative number of employees and job types. Enough sampling must be done to enable each employee's exposure level to be reasonably represented by at least one full shift (at least 7 hours) air sample. In addition, these air samples must be taken under conditions which represent each employee's regular, daily exposure to lead. All initial exposure monitoring must have been completed by May 30, 1979.

If you are exposed to lead and air sampling is performed, your employer is required to quickly notify you in writing of air monitoring results which represent your exposure. If the results indicate your exposure exceeds the PEL (without regard to your use of respirators), then your employer must also notify you of this in writing, and provide you with a description of the corrective action that will be taken to reduce your exposure.

Your exposure must be rechecked by monitoring every six months if your exposure is over the action level but below the PEL. Air monitoring must be repeated every 3 months if you are exposed over the PEL. Your employer may discontinue monitoring for you if 2 consecutive measurements, taken at least two weeks apart, are below the action level. However, whenever there is a production, process, control, or personnel change at your workplace which may result in new or additional exposure to lead, or whenever there is any other reason to suspect a change which may result in new or additional exposure to lead, your employer must perform additional monitoring.

III. METHODS OF COMPLIANCE - PARAGRAPH (E)

Your employer is required to assure that no employee is exposed to lead in excess of the PEL. The standard establishes a priority of methods to be used to meet the PEL.

IV. RESPIRATORY PROTECTION - PARAGRAPH (F)

Your employer is required to provide and assure your use of respirators when your exposure to lead is not controlled below the PEL by other means. The employer must pay the cost of the respirator. Whenever you request one, your employer is also required to provide you a respirator even if your air exposure level does not exceed the PEL. You might desire a respirator when, for example, you have received medical advice that your lead absorption should be decreased. Or, you may intend to have children in the near future, and want to reduce the level of lead in your body to minimize adverse reproductive effects. While respirators are the least satisfactory means of controlling your exposure, they are capable of providing significant protection if properly chosen, fitted, worn, cleaned, maintained, and replaced when they stop providing adequate protection.

Your employer is required to select respirators from the seven types listed in Table II of the Respiratory Protection section of the

standard (Sec. 1910.1025(f)). Any respirator chosen must be approved by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 42 CFR part 84. This respirator selection table will enable your employer to choose a type of respirator that will give you a proper amount of protection based on your airborne lead exposure. Your employer may select a type of respirator that provides greater protection than that required by the standard; that is, one recommended for a higher concentration of lead than is present in your workplace. For example, a powered air-purifying respirator (PAPR) is much more protective than a typical negative pressure respirator, and may also be more comfortable to wear. A PAPR has a filter, cartridge, or canister to clean the air, and a power source that continuously blows filtered air into your breathing zone. Your employer might make a PAPR available to you to ease the burden of having to wear a respirator for long periods of time. The standard provides that you can obtain a PAPR upon request.

Your employer must also start a Respiratory Protection Program. This program must include written procedures for the proper selection, use, cleaning, storage, and maintenance of respirators.

Your employer must ensure that your respirator facepiece fits properly. Proper fit of a respirator facepiece is critical to your protection from airborne lead. Obtaining a proper fit on each employee may require your employer to make available several different types of respirator masks. To ensure that your respirator fits properly and that facepiece leakage is minimal, your employer must give you either a qualitative or quantitative fit test as specified in Appendix A of the Respiratory Protection standard located at 29 CFR 1910.134.

You must also receive from your employer proper training in the use of respirators. Your employer is required to teach you how to wear a respirator, to know why it is needed, and to understand its limitations.

The standard provides that if your respirator uses filter elements, you must be given an opportunity to change the filter elements whenever an increase in breathing resistance is detected. You also must be permitted to periodically leave your work area to wash your face and respirator facepiece whenever necessary to prevent skin irritation. If you ever have difficulty in breathing during a fit test or while using a respirator, your employer must make a medical examination available to you to determine whether you can safely wear a respirator. The result of this examination may be to give you a positive pressure respirator (which reduces breathing resistance) or to provide alternative means of protection.

#### V. PROTECTIVE WORK CLOTHING AND EQUIPMENT - PARAGRAPH (G)

If you are exposed to lead above the PEL, or if you are exposed to lead compounds such as lead arsenate or lead azide which can cause skin and eye irritation, your employer must provide you with protective work clothing and equipment appropriate for the hazard. If work clothing is provided, it must be provided in a clean and dry condition at least weekly, and daily if your airborne exposure to lead is greater than 200 ug/m<sup>3</sup>. Appropriate protective work clothing and equipment can include coveralls or similar full-body work clothing, gloves, hats, shoes or disposable shoe coverlets, and face shields or vented goggles. Your employer is required to provide all such equipment at no cost to you. He is responsible for providing repairs and replacement as necessary, and also is responsible for the cleaning, laundering or disposal of protective clothing and equipment. Contaminated work clothing or equipment must be removed in change rooms and not worn home or you will extend your exposure and expose your family since lead from your clothing can accumulate in your house, car, etc. Contaminated clothing which is to be cleaned, laundered or disposed of must be placed in closed containers in the change room. At no time may lead be removed from protective clothing or equipment by any means which disperses lead into the workroom air.

#### VI. HOUSEKEEPING - PARAGRAPH (H)

Your employer must establish a housekeeping program sufficient to maintain all surfaces as free as practicable of accumulations of lead dust. Vacuuming is the preferred method of meeting this requirement, and the use of compressed air to clean floors and other surfaces is absolutely prohibited. Dry or wet sweeping, shoveling, or brushing may not be used except where vacuuming or other equally effective methods have been tried and do not work. Vacuums must be used and emptied in a manner which minimizes the reentry of lead into the workplace.

#### VII. HYGIENE FACILITIES AND PRACTICES - PARAGRAPH (I)

The standard requires that change rooms, showers, and filtered air lunchrooms be constructed and made available to workers exposed to lead above the PEL. When the PEL is exceeded the employer must assure that food and beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, except in these facilities. Change rooms, showers, and lunchrooms, must be used by workers exposed in excess of the PEL. After showering, no clothing or equipment worn during the shift may be worn home, and this includes shoes and underwear. Your own clothing worn during the shift should be carried home and cleaned carefully so that it does not contaminate your home. Lunchrooms may not be entered with protective clothing or equipment unless surface dust has been removed by vacuuming, downdraft booth, or other cleaning method. Finally, workers exposed above the PEL must wash both their hands and faces prior to eating, drinking, smoking or applying cosmetics.

All of the facilities and hygiene practices just discussed are essential to minimize additional sources of lead absorption from inhalation or ingestion of lead that may accumulate on you, your clothes, or your possessions. Strict compliance with these provisions can virtually eliminate several sources of lead exposure which significantly contribute to excessive lead absorption.

#### VIII. MEDICAL SURVEILLANCE - PARAGRAPH (J)

The medical surveillance program is part of the standard's comprehensive approach to the prevention of lead-related disease. Its purpose is to supplement the main thrust of the standard which is aimed at minimizing airborne concentrations of lead and sources of ingestion. Only medical surveillance can determine if the other provisions of the standard have effectively protected you as an individual. Compliance with the standard's provision will protect most workers from the adverse effects of lead exposure, but may not be satisfactory to protect individual workers (1) who have high body burdens of lead acquired over past years, (2) who have additional uncontrolled sources of non-occupational lead exposure, (3) who exhibit unusual variations in lead absorption rates, or (4) who have specific non-work related medical conditions which could be aggravated by lead exposure (e.g., renal disease, anemia). In addition, control systems may fail, or hygiene and respirator programs may be inadequate. Periodic medical surveillance of individual workers will help detect those failures. Medical surveillance will also be important to protect your reproductive ability-regardless of whether you are a man or woman.

All medical surveillance required by the standard must be performed by or under the supervision of a licensed physician. The employer must provide required medical surveillance without cost to employees and at a reasonable time and place. The standard's medical surveillance program has two parts-periodic biological monitoring and medical examinations.

Your employer's obligation to offer you medical surveillance is triggered by the results of the air monitoring program. Medical surveillance

must be made available to all employees who are exposed in excess of the action level for more than 30 days a year. The initial phase of the medical surveillance program, which includes blood lead level tests and medical examinations, must be completed for all covered employees no later than August 28, 1979. Priority within this first round of medical surveillance must be given to employees whom the employer believes to be at greatest risk from continued exposure (for example, those with the longest prior exposure to lead, or those with the highest current exposure). Thereafter, the employer must periodically make medical surveillance-both biological monitoring and medical examinations-available to all covered employees.

Biological monitoring under the standard consists of blood lead level (PbB) and zinc protoporphyrin tests at least every 6 months after the initial PbB test. A zinc protoporphyrin (ZPP) test is a very useful blood test which measures an effect of lead on your body. Thus biological monitoring under the standard is currently limited to PbB testing. If a worker's PbB exceeds 40 ug/100g the monitoring frequency must be increased from every 6 months to at least every 2 months and not reduced until two consecutive PbBs indicate a blood lead level below 40 ug/100g. Each time your PbB is determined to be over 40 ug/100g, your employer must notify you of this in writing within five working days of his receipt of the test results. The employer must also inform you that the standard requires temporary medical removal with economic protection when your PbB exceeds certain criteria. (See Discussion of Medical Removal Protection-Paragraph (k).) During the first year of the standard, this removal criterion is 80 ug/100g. Anytime your PbB exceeds 80 ug/100g your employer must make available to you a prompt follow-up PbB test to ascertain your PbB. If the two tests both exceed 80 ug/100g and you are temporarily removed, then your employer must make successive PbB tests available to you on a monthly basis during the period of your removal.

Medical examinations beyond the initial one must be made available on an annual basis if your blood lead level exceeds 40 ug/100g at any time during the preceding year. The initial examination will provide information to establish a baseline to which subsequent data can be compared. An initial medical examination must also be made available (prior to assignment) for each employee being assigned for the first time to an area where the airborne concentration of lead equals or exceeds the action level. In addition, a medical examination or consultation must be made available as soon as possible if you notify your employer that you are experiencing signs or symptoms commonly associated with lead poisoning or that you have difficulty breathing while wearing a respirator or during a respirator fit test. You must also be provided a medical examination or consultation if you notify your employer that you desire medical advice concerning the effects of current or past exposure to lead on your ability to procreate a healthy child.

Finally, appropriate follow-up medical examinations or consultations may also be provided for employees who have been temporarily removed from exposure under the medical removal protection provisions of the standard. (See Part IX, below.)

The standard specifies the minimum content of pre-assignment and annual medical examinations. The content of other types of medical examinations and consultations is left up to the sound discretion of the examining physician. Pre-assignment and annual medical examinations must include (1) a detailed work history and medical history, (2) a thorough physical examination, and (3) a series of laboratory tests designed to check your blood chemistry and your kidney function. In addition, at any time upon your request, a laboratory evaluation of male fertility will be made (microscopic examination of a sperm sample), or a pregnancy test will be given.

The standard does not require that you participate in any of the medical procedures, tests, etc. which your employer is required to make available to you. Medical surveillance can, however, play a very important role in protecting your health. You are strongly encouraged, therefore, to participate in a meaningful fashion. The standard contains a multiple physician review mechanism which would give you a chance to have a physician of your choice directly participate in the medical surveillance program. If you were dissatisfied with an examination by a physician chosen by your employer, you could select a second physician to conduct an independent analysis. The two doctors would attempt to resolve any differences of opinion, and select a third physician to resolve any firm dispute. Generally your employer will choose the physician who conducts medical surveillance under the lead standard-unless you and your employer can agree on the choice of a physician or physicians. Some companies and unions have agreed in advance, for example, to use certain independent medical laboratories or panels of physicians. Any of these arrangements are acceptable so long as required medical surveillance is made available to workers.

The standard requires your employer to provide certain information to a physician to aid in his or her examination of you. This information includes (1) the standard and its appendices, (2) a description of your duties as they relate to lead exposure, (3) your exposure level, (4) a description of personal protective equipment you wear, (5) prior blood lead level results, and (6) prior written medical opinions concerning you that the employer has. After a medical examination or consultation the physician must prepare a written report which must contain (1) the physician's opinion as to whether you have any medical condition which places you at increased risk of material impairment to health from exposure to lead, (2) any recommended special protective measures to be provided to you, (3) any blood lead level determinations, and (4) any recommended limitation on your use of respirators. This last element must include a determination of whether you can wear a powered air purifying respirator (PAPR) if you are found unable to wear a negative pressure respirator.

The medical surveillance program of the lead standard may at some point in time serve to notify certain workers that they have acquired a disease or other adverse medical condition as a result of occupational lead exposure. If this is true, these workers might have legal rights to compensation from public agencies, their employers, firms that supply hazardous products to their employers, or other persons. Some states have laws, including worker compensation laws, that disallow a worker who learns of a job-related health impairment to sue, unless the worker sues within a short period of time after learning of the impairment. (This period of time may be a matter of months or years.) An attorney can be consulted about these possibilities. It should be stressed that OSHA is in no way trying to either encourage or discourage claims or lawsuits. However, since results of the standard's medical surveillance program can significantly affect the legal remedies of a worker who has acquired a job-related disease or impairment, it is proper for OSHA to make you aware of this.

The medical surveillance section of the standard also contains provisions dealing with chelation. Chelation is the use of certain drugs (administered in pill form or injected into the body) to reduce the amount of lead absorbed in body tissues. Experience accumulated by the medical and scientific communities has largely confirmed the effectiveness of this type of therapy for the treatment of very severe lead poisoning. On the other hand, it has also been established that there can be a long list of extremely harmful side effects associated with the use of chelating agents. The medical community has balanced the advantages and disadvantages resulting from the use of chelating agents in various circumstances and has established when the use of these agents is acceptable. The standard includes these accepted limitations due to a history of abuse of chelation therapy by some lead companies. The most widely used chelating agents are calcium disodium EDTA, (Ca Na<sub>2</sub> EDTA), Calcium Disodium Versenate (Versenate), and d-penicillamine (penicillamine or Cupramine).

The standard prohibits "prophylactic chelation" of any employee by any person the employer retains, supervises or controls. "Prophylactic chelation" is the routine use of chelating or similarly acting drugs to prevent elevated blood levels in workers who are occupationally exposed to lead, or the use of these drugs to routinely lower blood lead levels to predesignated concentrations believed to be "safe". It should be emphasized that where an employer takes a worker who has no symptoms of lead poisoning and has chelation carried out by a physician (either inside or outside of a hospital) solely to reduce the worker's blood lead level, that will generally be considered prophylactic chelation. The use of a hospital and a physician does not mean that prophylactic chelation is not being performed. Routine

chelation to prevent increased or reduce current blood lead levels is unacceptable whatever the setting.

The standard allows the use of "therapeutic" or "diagnostic" chelation if administered under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring. Therapeutic chelation responds to severe lead poisoning where there are marked symptoms. Diagnostic chelation involved giving a patient a dose of the drug then collecting all urine excreted for some period of time as an aid to the diagnosis of lead poisoning.

In cases where the examining physician determines that chelation is appropriate, you must be notified in writing of this fact before such treatment. This will inform you of a potentially harmful treatment, and allow you to obtain a second opinion.

#### IX. MEDICAL REMOVAL PROTECTION - PARAGRAPH (K)

Excessive lead absorption subjects you to increased risk of disease. Medical removal protection (MRP) is a means of protecting you when, for whatever reasons, other methods, such as engineering controls, work practices, and respirators, have failed to provide the protection you need. MRP involves the temporary removal of a worker from his or her regular job to a place of significantly lower exposure without any loss of earnings, seniority, or other employment rights or benefits. The purpose of this program is to cease further lead absorption and allow your body to naturally excrete lead which has previously been absorbed. Temporary medical removal can result from an elevated blood lead level, or a medical opinion. Up to 18 months of protection is provided as a result of either form of removal. The vast majority of removed workers, however, will return to their former jobs long before this eighteen month period expires. The standard contains special provisions to deal with the extraordinary but possible case where a longterm worker's blood lead level does not adequately decline during eighteen months of removal.

During the first year of the standard, if your blood lead level is 80 ug/100g or above you must be removed from any exposure where your air lead level without a respirator would be 100 ug/m(3) or above. If you are removed from your normal job you may not be returned until your blood lead level declines to at least 60 ug/100g. These criteria for removal and return will change according to the following schedule:

	Removal blood lead (ug/100 g)	Air lead (ug/m(3))	Return blood lead (ug/100 g)
After Mar. 1, 1980..	70 and above....	50 and above..	At or below 50.
After Mar. 1, 1981..	60 and above....	30 and above..	At or below 40.
After Mar. 1, 1983..	50 and above averaged over six months.....	30 and above..	Do.

You may also be removed from exposure even if your blood lead levels are below these criteria if a final medical determination indicates that you temporarily need reduced lead exposure for medical reasons. If the physician who is implementing your employers medical program makes a final written opinion recommending your removal or other special protective measures, your employer must implement the physician's recommendation. If you are removed in this manner, you may only be returned when the doctor indicates that it is safe for you to do so.

The standard does not give specific instructions dealing with what an employer must do with a removed worker. Your job assignment upon removal is a matter for you, your employer and your union (if any) to work out consistent with existing procedures for job assignments. Each removal must be accomplished in a manner consistent with existing collective bargaining relationships. Your employer is given broad discretion to implement temporary removals so long as no attempt is made to override existing agreements. Similarly, a removed worker is provided no right to veto an employer's choice which satisfies the standard.

In most cases, employers will likely transfer removed employees to other jobs with sufficiently low lead exposure. Alternatively, a worker's hours may be reduced so that the time weighted average exposure is reduced, or he or she may be temporarily laid off if no other alternative is feasible.

In all of these situation, MRP benefits must be provided during the period of removal - i.e., you continue to receive the same earnings, seniority, and other rights and benefits you would have had if you had not been removed. Earnings includes more than just your base wage; it includes overtime, shift differentials, incentives, and other compensation you would have earned if you had not been removed. During the period of removal you must also be provided with appropriate follow-up medical surveillance. If you were removed because your blood lead level was too high, you must be provided with a monthly blood test. If a medical opinion caused your removal, you must be provided medical tests or examinations that the doctor believes to be appropriate. If you do not participate in this follow up medical surveillance, you may lose your eligibility for MRP benefits.

When you are medically eligible to return to your former job, your employer must return you to your "former job status." This means that you are entitled to the position, wages, benefits, etc., you would have had if you had not been removed. If you would still be in your old job if no removal had occurred that is where you go back. If not, you are returned consistent with whatever job assignment discretion your employer would have had if no removal had occurred. MRP only seeks to maintain your rights, not expand them or diminish them.

If you are removed under MRP and you are also eligible for worker compensation or other compensation for lost wages, your employer's MRP benefits obligation is reduced by the amount that you actually receive from these other sources. This is also true if you obtain other employment during the time you are laid off with MRP benefits.

The standard also covers situations where an employer voluntarily removes a worker from exposure to lead due to the effects of lead on the employee's medical condition, even though the standard does not require removal. In these situations MRP benefits must still be provided as though the standard required removal. Finally, it is important to note that in all cases where removal is required, respirators cannot be used as a substitute. Respirators may be used before removal becomes necessary, but not as an alternative to a transfer to a low exposure job, or to a lay-off with MRP benefits.

#### X. EMPLOYEE INFORMATION AND TRAINING - PARAGRAPH (L)

Your employer is required to provide an information and training program for all employees exposed to lead above the action level or who may suffer skin or eye irritation from lead. This program must inform these employees of the specific hazards associated with their

work environment, protective measures which can be taken, the danger of lead to their bodies (including their reproductive systems), and their rights under the standard. In addition your employer must make readily available to all employees, including those exposed below the action level, a copy of the standard and its appendices and must distribute to all employees any materials provided to the employer by the Occupational Safety and Health Administration (OSHA).

Your employer is required to complete this training program for all employees by August 28, 1979. After this date, all new employees must be trained prior to initial assignment to areas where there is a possibility of exposure over the action level.

This training program must also be provided at least annually thereafter.

#### XI. SIGNS - PARAGRAPH (M)

The standard requires that the following warning sign be posted in the work areas when the exposure to lead exceeds the PEL:

DANGER  
LEAD  
MAY DAMAGE FERTILITY OR THE UNBORN CHILD  
CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM  
DO NOT EAT, DRINK OR SMOKE IN THIS AREA

However, prior to June 1, 2016, employers may use the following legend in lieu of that specified above:

WARNING  
LEAD WORK AREA  
POISON  
NO SMOKING OR EATING

#### XII. RECORDKEEPING - PARAGRAPH (N)

Your employer is required to keep all records of exposure monitoring for airborne lead. These records must include the name and job classification of employees measured, details of the sampling and analytic techniques, the results of this sampling, and the type of respiratory protection being worn by the person sampled. Your employer is also required to keep all records of biological monitoring and medical examination results. These must include the names of the employees, the physician's written opinion, and a copy of the results of the examination. All of the above kinds of records must be kept for 40 years, or for at least 20 years after your termination of employment, whichever is longer.

Recordkeeping is also required if you are temporarily removed from your job under the medical removal protection program. This record must include your name and social security number, the date of your removal and return, how the removal was or is being accomplished, and whether or not the reason for the removal was an elevated blood lead level. Your employer is required to keep each medical removal record only for as long as the duration of an employee's employment.

The standard requires that if you request to see or copy environmental monitoring, blood lead level monitoring, or medical removal records, they must be made available to you or to a representative that you authorize. Your union also has access to these records. Medical records other than PbB's must also be provided upon request to you, to your physician or to any other person whom you may specifically designate. Your union does not have access to your personal medical records unless you authorize their access.

#### XIII. OBSERVATIONS OF MONITORING - PARAGRAPH (O)

When air monitoring for lead is performed at your workplace as required by this standard, your employer must allow you or someone you designate to act as an observer of the monitoring. Observers are entitled to an explanation of the measurement procedure, and to record the results obtained. Since results will not normally be available at the time of the monitoring, observers are entitled to record or receive the results of the monitoring when returned by the laboratory. Your employer is required to provide the observer with any personal protective devices required to be worn by employees working in the area that is being monitored. The employer must require the observer to wear all such equipment and to comply with all other applicable safety and health procedures.

#### XIV. FOR ADDITIONAL INFORMATION

A. Copies of the Standard and explanatory material may be obtained by writing or calling the OSHA Docket Office, U.S. Department of Labor, room N2634, 200 Constitution Avenue, N.W., Washington DC 20210. Telephone: (202) 219-7894.

1. The standard and summary of the statement of reasons (preamble), Federal Register, Volume 43, pp. 52952-53014, November 14, 1978.
2. The full statement of reasons (preamble) Federal Register, vol. 43, pp. 54354-54509, November 21, 1978.
3. Partial Administrative Stay and Corrections to the standard, (44 FR 5446-5448) January 26, 1979.
4. Notice of the Partial Judicial Stay (44 FR 14554-14555) March 13, 1979.
5. Corrections to the preamble, Federal Register, vol. 44, pp. 20680-20681, April 6, 1979.
6. Additional correction to the preamble concerning the construction industry, Federal Register, vol. 44, p. 50338, August 28, 1979.
7. Appendices to the standard (Appendices A, B, C), Federal Register, Vol. 44, pp. 60980-60995, October 23, 1979.
8. Corrections to appendices, Federal Register, Vol. 44, 68828, November 30, 1979.
9. Revision to the standard and an additional appendix (Appendix D), Federal Register, Vol. 47, pp. 51117-51119, November 12, 1982.
10. Notice of reopening of lead rulemaking for nine remand industry sectors, Federal Register, vol. 53, pp. 11511-11513, April 7, 1988.
11. Statement of reasons, Federal Register, vol. 54, pp. 29142-29275, July 11, 1989.

12. Statement of reasons, Federal Register, vol. 55, pp. 3146-3167, January 30, 1990.

13. Correction to appendix B, Federal Register, vol. 55, pp. 4998-4999, February 13, 1991.

14. Correction to appendices, Federal Register, vol. 56, p. 24686, May 31, 1991.

B. Additional information about the standard, its enforcement, and your employer's compliance can be obtained from the nearest OSHA Area Office listed in your telephone directory under United States Government/Department of Labor.

[60 FR 52856, Oct. 11, 1995; 63 FR 1152, Jan. 8, 1998; 71 FR 16673, April 3, 2006; 77 FR 17781, March 26, 2012]

---

[← Next Standard \(1910.1025 App C\)](#)

[← Regulations \(Standards - 29 CFR\) - Table of Contents](#)

[Freedom of Information Act](#) | [Privacy & Security Statement](#) | [Disclaimers](#) | [Customer Survey](#) | [Important Web Site Notices](#) | [International](#) | [Contact Us](#)

U.S. Department of Labor | Occupational Safety & Health Administration | 200 Constitution Ave., NW, Washington, DC 20210  
Telephone: 800-321-OSHA (6742) | TTY: 877-889-5627

[www.OSHA.gov](http://www.OSHA.gov)

## Appendix B

### Operations and Maintenance (O&M) Tasks That Have Been Assessed and Do Not Require Any Precautions and/or Protective Measures

#### Lead-Based Paint (LBP) De minimus Activities

1. Removal of nails, screws, picture hangers, or other fasteners, etc. from a painted wall surface.
2. Removal of cover plates, switch covers, etc. from a painted surface.
3. Removal of hinge pins or painted door hinges.
4. Removal of lock hardware, closers, or other hardware accessories from a painted door.
5. Wet sanding drywall compound or spackle using a sponge.
6. Separating and removing shoe mold (base shoe) from a painted baseboard.
7. Planing painted wood with manual tools.
8. Drilling or preparing a painted door from installation of new door hardware (lock set, closers, kick plates, etc.)
9. Renailing or refastening loose building trim, moldings or panels.
10. Reglazing of window glass.
11. Removal of painted phone line or electrical wire.
12. Freeing an inoperable window.
13. Housekeeping including emptying trash, vacuuming carpets, dust mopping hallways, cleaning water fountains, buffing floors, disinfecting bathrooms.
14. Maintenance including replacing air filters, replacing toilet flush valve, replacing light bulbs, checking and repairing shower valves, unclogging a shower drain using a “snake”, mechanical repair of an air-conditioning unit, and repairing a shower leak.
15. Carpentry activities including removing wooden windows to measure to make screens, sweeping out the carpentry shop, planing the edge of a door and re-install the hinges, re-hang the door, removing outside entrance door, removing the kickplate, and removing the screws.
16. Carpentry activities including removing door hinges and lockset and replacing.
17. Carpentry activities including sanding floor with “stand-behind” power disc sander, scraping floor near corner, clean-up of debris and placing debris in container.
18. Carpentry activities including wet hand scraping and wet sanding a column
19. Carpentry activities including removing wooden baseboards, cut and pull up wall-to-wall carpeting, scrape walls near baseboard, scrape carpet adhesive residue from floor, sweep floor.
20. Carpentry activities including removing window casing and wooden molding, removing the window sash, heating the glazing, scraping and removing the softened glazing, reinstalling the sash, re-hanging the window, and installing the wooden molding.
21. Removing old plaster and re-plastering, manually sanding new plaster.
22. Maintenance activities including wet scraping of window and door.
23. Plumber activities including manually removing old lead and oakum from around shower drains, heating lead in an open ladle using a propane torch, pouring the molten lead from the ladle into the cavity surrounding the drain, rapidly cooling the unused hot lead using cooling water from a sink faucet
24. Chipping and sanding plaster.
25. Painter activities including spreading plastic material around the hot-water radiator and wet scraping old paint from hot-water radiator, folding up the plastic on the floor, broom sweeping the floor.

---

## Appendix C

### **Operations and Maintenance (O&M) Tasks That Have Not Been Assessed and May Require Precautions and/or Protective Measures**

#### **Non-Assessed Tasks**

Operations in Appendix B where the activity has not been assessed, for example, where an operation is performed many times during a shift, such as drilling multiple holes to install screening on multiple windows.

## Appendix D

### Operations and Maintenance (O&M) Tasks on LBP That May Require Precautions and/or Protective Measures.

#### (National Institute of Building Sciences (NIBS) Work Practices)

Cleaning Damaged or Deteriorated LBP Surfaces

Removing LBP Chips and Debris

Removing Small Areas of LBP

Wet Sanding of LBP

Penetrating LBP

Removing Components from LBP Surfaces

Attaching to a LBP Surface

Applying Coatings to LBP Surfaces

Installing Materials Over LBP Surfaces

Enclosing a LBP Surface

Patching a LBP Surface

Exposing LBP Contaminated Cavities

LBP Door and Window Maintenance

Changing Filters and Waste Bags in LBP Contaminated HEPA Vacuums

Cleaning Lead Dust Contaminated Carpet

Landscaping in Soil Containing Elevated Levels of LBP

Each Work Practice comes with three levels of protection, depending on the scope of the task, how long the work will continue, and especially the condition of the LBP and substrate which will be disturbed. The higher the Level of activity, the higher the level of preparation and worker protection required.

Level 1 is described as those activities requiring a minimal amount of preparation and worker protection because a negligible amount of lead dust may be generated or disturbed.

Level 2 consists of activities producing moderate amounts of dust and debris.

Level 3 are activities which could generate substantial quantities of dust and debris.

Complex activities not specifically described in the work practices can usually be performed by modifying and combining various parts of several different work practices. For example, to replace a metal fireplace unit might require the following combination of work practices:

- Removing LBP Chips and Debris

- Removing Components from LBP Surfaces

- Attaching to a LBP Surface

- Patching a LBP Surface

- Exposing LBP Contaminated Cavities

*Note.* The above recommendations are based on *Lead-Based Paint: Operations and Maintenance Work Practices Manual for Homes and Buildings (May 1995)*. National Institute of Building Science (NIBS).