

Midland Engineering Co., Inc. Safety Management System			Doc No:	LEAD
			Initial Issue Date	12/04/15
			Revision Date:	Initial Version
Chapter 24-Lead Awareness			Revision No.	0
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POLICY

To provide a hazard free workplace and have a Lead Protection Program to ensure the safety and health of all Midland Engineering Co., Inc. employees performing job tasks in which a potential lead exposure could occur.

Compliance with this program is mandatory and is applicable to all Midland Engineering Co., Inc. employees who work in an environment where lead is present in any amount. Failure to comply will result in disciplinary action and/or is grounds for termination.

METHODS OF COMPLIANCE

The nature of job activities sometimes involves working with lead environments where there is a potential for lead exposure. Prior to commencing work on a job site where potential lead exposure is identified as a hazard, a pre-job investigation using the Lead Assessment Form is completed which allows the company to provide effective control methods for employees. The Lead Protection Program incorporates all of the requirements of 29 CFR 1926.62(e)(2)(ii)(A)-(I) as follows:

- 1926.62(e)(2)(ii)(A) A description of each activity in which lead is emitted; e.g. equipment used, material involved, controls in place, crew size, employee job responsibilities, operating procedures and maintenance practices.
- 1926.62(e)(2)(ii)(B) A description of the specific means that will be employed to achieve compliance and, where engineering plans and studies used to determine methods selected for controlling exposure to lead.
- 1926.62(e)(2)(ii)(C) A report of the technology considered in meeting the PEL.
- 1926.62(e)(2)(ii)(D) Air monitoring data which documents the source of lead emissions.
- 1926.62(e)(2)(ii)(E) A detailed schedule for implementation of the program, including documentation such as copies of purchase orders for equipment, construction contracts, etc.

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- 1926.62(e)(2)(ii)(F) A work practice program which includes items required under paragraphs (g) *protective work clothing and equipment*, (h) *housekeeping*, and (i) *hygiene facilities and practice* of this program and incorporate other relevant work practices such as those specified in paragraph (e)(5) *employees will follow safe work practice*.
- 1926.62(e)(2)(ii)(G) An administrative control schedule required by paragraph (e)(4) *administrative controls-implementation of a job rotation schedule*.
- 1926.62(e)(2)(ii)(H) A description of arrangements made among contractors on multi-contractor sites with respect to informing affected employees of potential exposure to lead and with respect to responsibility for compliance with this program.
- 1926.62(e)(2)(ii)(I) Other relevant information. (e.g. site inspections, revision of the program every six months, and reviewing the performance of mechanical ventilation).

Once the site specific Lead Assessment Form is completed (this form provides a specific step by step sequence for implementing all aspects of the program) all applicable employees will receive information and training for the identified areas of potential lead exposure at that site. During work activities, the site manager or supervisor will periodically inspect the area to maintain the effectiveness of the lead protection program. If the inspection reveals a change in the work environment that could increase potential lead exposure, all employees will evacuate the area and a follow-up lead assessment will be completed and the necessary additional precautions will be implemented before work activities resume.

DEFINITIONS

Permissible Exposure Limit - means the dermal or inhalation exposure limit figured on an (8) eight-hour time weighted average of (50) micrograms per cubic meter of air.

Time Weighted Average (TWA) - the sum of all exposure over an 8-hour work shift.

Action Level - employee exposure, without regard to the use of respirators, to an airborne concentration of lead of 30 ug/m³ averaged over an (8) hour time weighted average.

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Exposure Assessment - Employers are required to determine if any employee is exposed to lead concentrations at or above the action level of (30) thirty microns per cubic meter of air at an (8) eight hour TWA.

Lead (Pb) - metallic lead, all inorganic lead compounds, and organic lead soaps. It 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. Excluded from this definition are all other organic lead compounds.

Final Medical Determination - the outcome of a multiple physical review or an alternate medical determination.

INTRODUCTION

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, shipbuilding and ship repair, auto manufacturing, and printing. As an employee of Midland Engineering Co., Inc., potential exposure to various forms and amounts of lead may occur during certain jobsite activities. Lead exposure is not limited to the lead industries; in fact, food, water, and air all contain certain amounts of lead. Therefore, each of us has normal amounts of lead stored in body tissue.

FORMS OF LEAD EXPOSURE

- Lead Metal
- Lead Dust
- Lead Fumes
- Lead Mist

Non-occupational exposure to lead is less than industrial exposure. Lead and lead forms are found at operations such as stacking, pasting, casting, burning and smelting, oxide manufacturing and assembly. There may be a potential health hazard at manufacturing facilities where lead is a part of operations.

Other possible locations of lead containing materials can be found, but is not limited to, in such places as leaded paints, leaded solders, pipes, batteries, circuit boards, cathode ray tubes, leaded glass, and demolition/salvage materials.

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WAYS LEAD CAN ENTER THE BODY

- Inhalation
- Ingestion

When lead is absorbed into the body in certain doses it is a toxic substance. Lead is not absorbed through the skin, but can enter the body by inhalation and ingestion. When lead is scattered through the air as a dust, fume, or mist it can be inhaled and absorbed by the lungs and upper respiratory tract.

Inhalation of airborne lead is generally the most important source of occupational lead absorption. Lead can also be absorbed through the digestive system if swallowed. Handling food, cigarettes, chewing tobacco, or make-up with hands contaminated with lead will contribute to ingestion. It is for these reason that eating, drinking, and smoking in identified lead areas are avoided.

Lead blood levels will continue to increase if exposure is not controlled. A significant portion of the lead that you inhale or ingest gets into the blood stream. Once in your blood stream, lead is circulated throughout your body and stored in various organs and body tissue. Some of the lead is filtered out of the body by excretion, but some remains in the blood and other tissues. The amount of lead stored in the body will increase if lead absorption is more than body excretion. The lead stored in the body can slowly cause irreversible damage to cells, organs, and the body system.

HEALTH EFFECTS OF LEAD OVEREXPOSURE

If steps are not taken to control exposure, continued absorption of lead could result in:

- Constipation or diarrhea
- Lack of appetite
- Weight loss
- Nausea
- Abdominal pain
- Adverse effects in the male and female reproductive systems
- Adverse effects in an unborn fetus

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Short Term Overexposure (Acute)

Lead is a systemic poison that serves no known useful function once absorbed by the body. Exposure to lead in large enough quantities can kill in a matter of days. A condition affecting the brain may arise, known as acute encephalopathy that develops into seizures, coma, and death. A short-term exposure of this magnitude is highly unlikely, but not impossible. There is no sharp dividing line between developing acute and chronic health effects. Lead adversely affects numerous body systems and causes forms of health impairment and disease that arise after periods of exposure as short as days or as long as several years.

Long Term Overexposure (Chronic)

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, excessive tiredness, weakness, insomnia, headache, nervous irritability, muscle and joint pain or soreness, fine tremors, numbness, dizziness, and hyperactivity. At this stage, a qualified physician may diagnose lead poisoning.

Human Reproductive & Fetal Health

The medical and scientific community has recognized that lead exposure can have significant adverse health effects on an unborn fetus and the reproductive systems of males and females. At current acceptable OSHA blood-lead levels there are no known teratogenic effects that may result in birth defects or malformations, however, at higher blood-lead levels diverse effects have been reported. Some symptoms of lead overexposure affecting the male reproductive system may include a decrease in sexual drive, impotence, decreased ability to produce healthy sperm and sterility. With respect to females, these effects may include menstrual disturbances, decreased viability of the fertilized ovum and changes in reproductive capacity.

REPORTING OF PROBLEMS

Immediately notify your supervisor if you develop potential signs or symptoms associated with lead poisoning. You should also notify your supervisor if you have difficulty breathing while wearing a respirator or suspect problems with other personal protective equipment.

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EXPOSURE ASSESSMENT

The company will determine if employees are exposed to concentrations of lead at or above the action level of 30 ug/m³ on an eight-hour TWA. The exposure determination shall be based on the following:

- Personal exposure monitoring
- Objective data demonstrating that the lead containing material, product, process, operation, or activity cannot result in exposure at or above the action level
- Historical measurements of airborne lead that have been taken within the last 12 months

If the initial exposure determination reveals employee exposure to be at or below the PEL, monitoring will be performed at least every six months. If the exposure determination reveals employee exposure above the PEL, monitoring will be performed quarterly. Additional monitoring will take place if a change in an operations production process occurs which may result in additional exposure to lead. In addition, employees will be given written notification of the results of their exposure assessment within five working days.

PREVENTING LEAD ABSORPTION

Proper control of exposure to lead is the responsibility of both the employer and the employee. All of the control methods discussed below are essential to minimize additional sources of lead absorption from inhalation or ingestion of lead that may accumulate on you, your clothing, or your possessions. High personal standards of cleanliness are necessary. Strict compliance with these provisions can virtually eliminate several sources of lead exposure that significantly contribute to excessive lead absorption. Employees shall not disturb lead containing materials.

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Respiratory Protection

Exposure to hazardous materials requires special precautions against absorption of toxic compounds. While engineering controls (e.g. ventilation systems) are the primary means of controlling materials such as lead dust, fumes, vapors, and mists, it is often necessary to rely on respiratory protection. The respirator will give you the proper amount of protection based on the nature of the hazard. Only use respirators tested and certified by the National Institute for Occupational Safety & Health (NIOSH). The cartridges that come with the mask are approved for the environment in which you will be working. Never use a cartridge respirator in an atmosphere containing less than 19.5% oxygen or an atmosphere immediately dangerous to life and health (IDLH). In addition, observe the requirements of the Respiratory Protection Program.

Protective Work Clothing & Equipment

Protective clothing and equipment must be worn when the exposure to lead and lead compounds is above the PEL. If work clothing is provided, it will be given to you in a clean and dry condition at least weekly, and daily if your airborne exposure to lead is greater than 200 ug/m³. Protective work clothing and equipment can include coveralls, tyvek coveralls, gloves, hats, shoes, shoe coverlets, face shield or vented goggles. All clothing and equipment will be repaired, replaced, cleaned, laundered, or disposed of as necessary by the company. Contaminated work clothing and equipment must be removed in the designated change room and placed in the provided closed containers to be cleaned or disposed of. At no time may lead be removed from protective clothing or equipment by any means which disperses lead into the workplace air.

Hygiene Facilities & Practices

Employees exposed to lead above the PEL must change, shower, and eat in designated areas. After changing and showering no clothing or equipment worn during the shift should be carried home, this includes shoes and underwear. The change area will be equipped with separate storage facilities for protective work clothing and equipment and for street clothing to prevent cross-contamination. The container for lead contaminated clothing will be labeled as follows: CAUTION: CLOTHING CONTAMINATED WITH LEAD. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS. Lunchrooms may not be entered with protective clothing or equipment unless surface dust has been removed by vacuuming, down draft booth, or other accepted cleaning method. Finally, workers exposed above the PEL must wash both their hands and face prior to eating, drinking, smoking, or applying cosmetics.

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Housekeeping & Cleaning Practices

All surfaces will be maintained as free as practicable of accumulation of dust. In addition, the use of compressed air to clean floors and other surfaces is restricted. When vacuuming methods are used, take special precaution when emptying the vacuum to minimize the re-entry of lead into the workplace atmosphere. Where vacuuming methods are not feasible, shoveling, dry or wet sweeping, and brushing are acceptable.

Administrative Controls & Practices

Based on the specific site lead assessment, the company will implement a job rotation schedule as one means of reducing an employees TWA exposure to lead. The schedule includes the name or identification number of each effected employee, the duration and exposure levels at each job or work station where effected employees are located, and any other information useful in assessing the reliability of the administrative controls used to reduce potential lead exposure.

MULTI-CONTRACTOR SITES

When working on multi-contractor site, Midland Engineering Co., Inc. ensures protection of its employees. If inadequate containment of lead exposure is the result of surrounding employers and is affecting Midland Engineering Co., Inc. employees, Midland Engineering Co., Inc. will remove its employees from the worksite area until exposure control is repaired.

MEDICAL SURVEILLANCE

The medical surveillance program is part of the comprehensive approach to the prevention of lead related disease. Its purpose is to supplement the lead program that is aimed at minimizing airborne concentrations of lead and sources of ingestion. Only medical surveillance can determine if the provisions of the lead program have effectively protected an employee. Periodic medical surveillance of individual employees will help detect those failures in the lead program and engineering techniques.

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Biological Monitoring

The initial phase of the medical surveillance program includes blood-lead and zinc level tests. Biological monitoring will be made available to all employees who are exposed in excess of the action level for more than thirty days a year:

- At least every six months.
- If the last blood sampling and analysis indicated a blood lead level at or above 40 ug/100g of whole blood, monitoring will continue every two months.
- Monitoring will continue until two consecutive blood samples and analysis indicate a blood lead level below 40 ug/100g of whole blood.

Written notification of test results will be given to employees within five days indicating blood lead levels and be given medical removal protection benefits when blood sampling and analysis indicate a blood lead level at or above 40 ug/100g of whole blood.

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Medical Examinations and Consultations

The second phase of medical surveillance is medical examinations and consultations for employees who meet the following conditions:

- Employees who are exposed in excess of the action level for more than thirty days a year.
- At least annually for each employee for whom a blood-sampling test conducted at any time during the preceding 12 months indicated a blood level at or above 40 ug/100g.
- Prior to the assignment for the first time to an area in which airborne concentrations of lead are at or above the action level.
- As soon as possible, upon notification by an employee, that he/she has developed signs and symptoms commonly associated with lead intoxication, or desire medical advice concerning the effects of current or past exposure to lead and the ability to procreate a healthy child.
- As medically appropriate for each employee either removed from exposure to lead due to risk of sustaining material impairment to health, or otherwise limited pursuant to a final medical determination

A licensed physician will perform all medical examinations and a laboratory licensed by the Center for Disease Control will perform consultations, sampling and analysis tests.

MEDICAL REMOVAL PROTECTION

Excessive lead absorption subjects employees to increased risk of disease. Medical Removal Protection (MRP) is a means of protecting employees when, for whatever reasons, such as engineering controls, work practices, and respirators, have failed to provide the needed protection. MRP involves the temporary removal of an employee from his or her regular job to a place of lower exposure without loss of earnings, seniority, or benefits.

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POSTING WARNING SIGNS

Appropriate work practices must be followed to ensure the lead containing materials are not disturbed. A warning sign must be illuminated, kept clean, and posted in work areas where the exposure to lead exceeds the PEL. The sign must read WARNING-LEAD WORK AREA-POISON-NO SMOKING OR EATING

EMPLOYEE INFORMATION & TRAINING

Information and training will be given to all employees who may be exposed to lead above the action level, or who may suffer skin or eye irritation from lead. Lead awareness training is required at time of hire, during orientation, or before assignment to areas containing lead. The training program will inform employees of the following:

- Specific hazards associated with their work environment
- Personal protective equipment
- Lead exposure
- Dangers of lead
- Health hazards associated with lead overexposure
- Employee rights under the lead standard

Refresher training must be given annually.

Documentation of employee information and training includes training date, employee name and instructor name and is kept on file at the corporate office.

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RECORD KEEPING

The following records will be kept on file at the corporate office or job sites, if applicable:

Exposure monitoring for airborne lead

- Name and job classification of employees measured
- Details of the sampling and analytic techniques
- Results of the sampling
- Type of respiratory equipment worn
- Records will be kept on file for 40 years or for at least 20 years after termination of employment, whichever is longer

Biological Monitoring & Medical Evaluations

- Names of employees and social security numbers
- Physicians written opinion
- Copy of exam results
- Records will be kept on file for 40 years or for at least 20 years after termination of employment, whichever is longer

Temporary Removal

- Name and social security number
- Date of removal and return
- How the removal was or is being accomplished
- Whether or not the removal was an elevated blood lead level
- Kept for duration of employment

Job Rotation Schedules

- Name and identification number of each effected employee
- Duration and exposure levels at each job or work station where each affected employee is located
- Any other information useful in assessing the effectiveness and reliability of the rotation schedule

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Lead Assessment Form

- Description of the facility and potential lead exposure areas
- Job description of employees working in the potential lead exposure area
- Any specific operating and maintenance procedures
- Any engineering controls necessary or in place to prevent potential exposure to lead
- All air and emissions monitoring results of the area are copied for company records
- Any specific protective clothing and respiratory protection required
- Any job specific rotation schedules
- Necessary hygiene facilities and practices
- Mandatory housekeeping and cleaning practices
- All mechanical ventilation will be evaluated for effective performance
- Identification of safe work practice controls

Acknowledgment of Training Form

- Documentation of employee training(training date, employee and instructor names)

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JOB-SITE LEAD ASSESSMENT FORM

Job Location Address: _____

Crew Size & Job Activities: _____

Does job site already use Lead Standard Operating Procedures & Practices? ___Yes ___No

If yes please list or attach: _____

List Lead Exposure Controls in Place at the job site: _____

List identified areas of potential lead exposure: _____

Did the company receive all Air Monitoring Data? ___Yes ___No If yes please attach.

Is a Job Rotation Schedule Required? ___Yes ___No

List Specific Personal Protective Equipment Required: _____

List Specific Housekeeping Requirements: _____

Location of Hygiene Facilities and Specific Procedures: _____

List Specific Safe Work Practice Procedures: _____

Inspector: _____ Date: _____

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LEAD PROTECTION PROGRAM QUIZ & ACKNOWLEDGMENT OF TRAINING

Name: _____ Date: _____

1. Excessive lead absorption subjects employees to increased risk of harm. True False
2. Ways lead can enter the body are inhalation and ingestion. True False
3. If steps are not taken to control exposure, continued absorption of lead could result in nausea, abdominal pain, adverse effects in the male and female reproductive systems, and adverse effects in an unborn fetus. True False
4. Immediately notify your supervisor if you think you have developed potential signs or symptoms associated with lead poisoning. True False
5. Control of exposure to lead is the responsibility of both the employer and the employee. True False
6. It is essential to minimize additional sources of lead absorption from inhalation or ingestion of lead that may accumulate on you, your clothing, or your possessions. High personal standards of cleanliness are necessary. True False
7. Engineering controls (e.g. ventilation systems) are the primary means of controlling materials such as lead dust, fumes, vapors, and mists, it may be necessary to use respirators. True False
8. Protective clothing and equipment must be worn when the exposure to lead and lead compounds are above the PEL. True False
9. All clothing and equipment must be repaired, replaced, cleaned, laundered, or disposed of as necessary. True False
10. Contaminated work clothing and equipment must be removed in the designated change room and placed in the provided closed containers to be cleaned or disposed of. True False
11. At no time may lead be removed from protective clothing or equipment by any means which disperses lead into the workplace air. True False
12. Employees exposed to lead above the PEL must change, shower, and eat in designated areas. True False
13. Workers exposed above the PEL must wash both their hands and face prior to eating, drinking, smoking, or applying cosmetics. True False

I acknowledge that I have received information and training on the dangers of lead and the policies and procedures in place to protect myself. This training has given me an understanding that lead may have adverse health effects on my health and the health of a developing fetus. Furthermore, I understand that the decision to work in a potential lead exposed job is mine, exclusively, and that if I make this choice, I do so voluntarily. If I do not understand any of the materials presented to me I will ask questions.

Employee Signature

Instructor Signature