



Airswift
HSE Management System

Lead Awareness

Important Notice:

1. This procedure is a Controlled Document and shall not be amended without the authority of the Operations Manager - North America.
2. Any queries or feedback concerning the contents of this document should be addressed to the Operations Manager - North America.

Prepared	Reviewed	Approved	Effective Date	Issue Number
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1.0 PURPOSE

This safety guideline is intended to provide suitable information to all Airswift employees regarding the potential effects of lead and where lead may be found so that adequate measures can be taken to limit exposures through controls in the workplace.

2.0 GENERAL

The objective of this guideline is to prevent absorption of harmful quantities of lead. The guideline is intended to protect employees from the immediate toxic effects of lead and from the serious toxic effects that may not become apparent until years of exposure have passed.

3.0 CHARACTERISTICS

To understand why lead is so hazardous, it is important to know what it is, the hazardous effects on people, and which materials do or may contain lead.

What Is It?

Pure lead (Pb) is a heavy metal and is a basic chemical element. It can combine with various other substances to form numerous lead compounds.

Where Can It Be Found?

Lead can be found in:

- Old glossy paints used on walls and pipe.
- Building and roof metal support frames.
- Cracked or peeling paint,
- Visible paint dust, grindings, or shavings.

*For employees placed at a client facility. Report to the Client contact/supervisor anytime you suspect lead-containing materials that may not have been disclosed:

4.0 HEALTH EFFECTS

I. Ways in which lead enters your body.

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 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 common source of

occupational lead absorption. You can also absorb lead through your digestive system if lead gets into your mouth and is swallowed.

Hazards encountered with lead occur when:

- ◆ Inhaling lead as dust, fume or mist.
- ◆ Ingesting lead through food, cigarettes, and chewing tobacco when handled with contaminated hands.

A significant portion of the lead that you inhale or ingest gets into your blood stream. Once in your blood system, 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

II. Effects of overexposure to lead

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 cardio-respiratory 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.

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, or behavioral disorders or to 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 fatigue as a result of decreased oxygen-carrying capacity in the blood.

5.0 PROCEDURES

5.1 Permissible Exposure Limit (PEL)

The current OSHA & Cal/OSHA lead standard is 50 µg/m³ as an 8-hour Time Weighted Average (TWA). The standard as it applies to construction is unique in that it groups tasks *presumed* to create employee exposures above the PEL of 50 µg/m³ as an 8-hour TWA, as follows:

LEAD-RELATED CONSTRUCTION TASKS AND THEIR 8-HOUR TWA EXPOSURE LEVELS

> 50 to 500 µg/m ³	> 500 µg/m ³ to 2,500 µg/m ³	> 2,500 µg/m ³
Manual demolition	Using lead-containing mortar	Abrasive blasting



Dry manual scraping	Lead burning	Welding
Dry manual sanding	Rivet busting	Torch cutting
Heat gun use	Power tool cleaning without dust detection systems	Torch burning
Power tool cleaning with dust collection systems	Cleanup of dry expendable abrasive blasting jobs	
Spray painting with lead paint	Abrasive blasting enclosure movement and removal	

5.2 Action Level

The standard also establishes an action level of 30 micrograms per cubic meter of air (30 µg/m³), time-weighted average, based on an 8-hour workday. The action level initiates several requirements of the standard, such as exposure monitoring, medical surveillance, and training and education.

5.3 Evaluation Process

The Client’s contact/supervisor will provide Airswift employees with results of any evaluation processes and a listing of lead containing material. The Client will also provide all precautions and render the area safe for employees before work begins. The program submitted to Airswift employees must list possible locations containing materials such as leaded paints, leaded solders, pipes, batteries, circuit boards, cathode ray tubes, leaded glass, and demolition/salvage materials.

5.4 Medical Surveillance

If it is found that Airswift employees have been exposed to lead levels above the OSHA & Cal/OSHA PEL, they will be placed into a medical surveillance program. The medical surveillance program is part of the OSHA/Cal/OSHA 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

provisions will protect most workers from the adverse effects of lead exposure, but may not be satisfactory to protect individual workers:

- Who have high body burdens of lead acquired over past years,
- Who have additional uncontrolled sources of non-occupational lead exposure,
- Who exhibit unusual variations in lead absorption rates, or
- Who have specific non-work related medical conditions that 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.

6.0 SAFE WORK PRACTICES

Airswift employees are not permitted to work in areas where there may be a potential for lead exposure. If it is necessary to perform any work where the exposure to Lead is above the OSHA& Cal/OSHA acceptable limits, then Airswift and/or the Client must implement a comprehensive mandated safety policy and procedure that includes special elements of exposure monitoring, formal medical program, engineering controls, special personal protective equipment, and much more. All workers performing duties in restricted areas shall wear protective clothing that protects other clothing worn by the worker from lead contamination. Employees' hands and faces should be washed if lead containing materials are contacted.

Below are listed possible work controls and practices:

1. WELDING, BURNING, AND TORCH CUTTING.

Welding and cutting activities that potentially involve exposure to lead can occur as part of a number of construction projects such as highway/railroad bridge rehabilitation (including elevated mass-transit lines), demolition, and indoor and outdoor industrial facility maintenance and renovation. Lead exposures are generated when a piece of lead-based painted steel is heated to its melting point either by an oxyacetylene torch or an arc welder. In this situation, lead becomes airborne as a volatilized component of the coating.

The amount of time a worker may spend actually welding or cutting can vary from only a few minutes up to a full shift. In addition, the coating being worked on may consist of several layers of lead-based paint, each of which could contain as much as 50% lead. Taken together, these factors suggest that a worker's exposure to airborne lead during welding or cutting activities can vary widely and may be exceedingly high. Lead burning, a process by which virgin or alloyed lead is melted with a torch or otherwise fused to another lead object, is typically performed in maintenance operations on electrostatic

precipitators or during the installation of lead shot, bricks, or sheets in the walls or floors of health-care x-ray units or industrial sites. Lead health hazards in this operation, as in welding and torch cutting, are from lead that is superheated and released into the worker's breathing zone in the form of a fume.

- **Engineering Controls.** The engineering controls that can be used, depending on feasibility, are:
 - ⇒ Local exhaust ventilation (LEV) that has a flanged hood and is equipped with HEPA filtration may be appropriate where the use of LEV does not create safety hazards. Use of a flexible duct system requires that the welder be instructed to keep the duct close to the emission source and to ensure the duct is not twisted or bent.
 - ⇒ A fume-extractor gun that removes fumes from the point of generation is an alternative to an exhaust hood for gas-shielded arc-welding processes. Such extraction systems can reduce breathing zone concentrations by 70% or more. These systems require that the gun and shielding gas flow rates be carefully balanced to maintain weld quality and still provide good exhaust flow.
 - ⇒ A longer cutting torch can be used in some situations to increase the distance from the lead source to the worker's breathing zone.
 - ⇒ Hydraulic shears can sometimes be used to mechanically cut steel that is coated with lead based-paint. The use of this method is limited by the ability of the shears to reach the cutting area.
 - ⇒ Whenever possible, pneumatic air tools should be used to remove rivets in lieu of burning and torch cutting.
- **Work Practice Controls.** The following work practice controls will help to reduce worker exposures to lead during welding, burning, and torch cutting:
 - ⇒ Strip back all lead-based paint for a distance of at least 4 inches in all directions from the area of heat application. Chemical stripping, vacuum-shrouded hand tools, vacuum blasting, or other suitable methods may be used. However, in enclosed spaces strip back or protect the workers with air-line respirators.
 - ⇒ Ensure that workers avoid the smoke plume by standing to the side or upwind of the cutting torch whenever the configuration of the job permits.
 - ⇒ Prohibit burning to remove lead-based paint. Paint should be removed using other methods, such as chemical stripping, power tools (e.g. needle guns) with vacuum attachments, etc.

2. MANUAL SCRAPING AND SANDING OF LEAD-BASED PAINTS.

Hand scraping of lead-based paints involves the use of a hand-held scraping tool to remove paint from coated surfaces. The health hazards in this activity are caused by the lead dust and paint chips produced in the scraping process. Hand sanding can also produce excessive dust. These activities are typically performed during residential and commercial/institutional lead abatement projects.

- **Engineering and Work Practice Controls.** Controls that employers can implement to protect workers performing scraping and sanding of lead-based paints are:

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Date: 07.20.2023

Version: 7

Owner: Operations Manager – North America



- ⇒ Use of wet-sanding and wet-scraping methods in conjunction with HEPA vacuuming or HEPA mechanical ventilation. Wet methods include misting of peeling paint with water before scraping, and sanding and misting of debris prior to sweeping or vacuuming.
- ⇒ Use of shrouded power tools with HEPA vacuum attachments. The shroud must be kept flush with the surface.
- ⇒ Use of techniques with known low exposure potential, such as encapsulation and removal or replacement instead of hand scraping and hand sanding.

7.0 REGULATED AREAS

The Client shall ensure a work plan is designed and implemented that will:

- ✓ Eliminate lead dust or fumes from exposing both work personnel and building occupants.
- ✓ Ensure that unauthorized persons cannot access the area.
- ✓ Use of signage - warning signs shall be provided and displayed at each regulated area, and is posted at all approaches to regulated areas.

8.0 TRAINING

All employees will be provided awareness training in this program in order to be familiar with the potential hazards and proper safe work procedures to follow if exposed to this health hazard.

Lead awareness training is required for employees whose work activities may contact lead containing materials but do not disturb the material during their work activities.

Training and information will be provided for all employees exposed to lead at or above the action level, or who may suffer skin or eye irritation from lead. The training will inform exposed employees of:

- Specific hazards associated with their work environment,
- Protective measures which can be taken,
- Danger of lead to their bodies (including their reproductive systems), and
- Their rights under the standard.

Lead awareness training is required at the time of hire, during orientation, or before assignment to areas containing lead. Refresher training must be given annually.

Lead awareness training should be documented including dates of training, employee name, and trainer name.