

LONGWOOD  
UNIVERSITY

LEAD AWARENESS  
TRAINING FOR  
LABORATORIES

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Office of Environmental Health and  
Occupational Safety

201 High Street  
Farmville, VA 23909  
434.395.2940

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**LEAD AWARENESS TRAINING for LABORATORIES****Substance:** Lead (Pb)**CAS Registry Number:** 7439-92-1**Synonym:** Metallic Lead

**Introduction:** The Occupational Safety and Health Administration (OSHA) considers Lead to be a toxic and hazardous substance. The OSHA Standard can be found in the Code of Federal Regulations, 29 CFR 1910.1025. The major elements of OSHA's Lead Standard are: A permissible exposure limit (PEL) of 50 micrograms of Lead per cubic meter of air, as averaged over an 8-hour period. Requirements that employers use engineering controls and work practices, where feasible, to reduce worker exposure. Requirements that employees observe good personal hygiene practices. Requirements that employees be provided with protective clothing, and where necessary, with respiratory protection.

This document is intended to raise your awareness level about the health and safety hazards associated with the use and handling of Lead, provide you with information on how to protect yourself from these hazards and provide you with a summary of key provisions of the OSHA standard.

Always read the Material Safety Data Sheet (MSDS) or Safety Data Sheet (SDS) before using this chemical.

**Appearance and Odor:** Silvery grey metal, lustrous when freshly cut, loses its shine when exposed to air. Odorless

**Physical and Chemical Properties:**

Soluble: Dilute Nitric acid, Insoluble in water	Odor Threshold:	No odor
	Flash Point:	Not combustible
	LEL:	N/A
	UEL:	N/A
	Specific Gravity:	11.35 at 20°C
	Vapor Pressure:	0 mm Hg at 20°C
	Boiling Point:	1,740°C
	Melting Point:	327.5°C
	Molecular Weight:	207.19

**Hazard Summary**

Hazard Rating	NFPA
Health	4
Flammability	0
Reactivity	0
Special Hazard	
CARCINOGEN TERTAOGEN POISONOUS FUMES ARE PRODUCED IN FIRE DOES NOT BURN	

*Hazard Rating Key: 0=minimal: 1=slight: 2=moderate:  
3=serious: 4=severe*

**First Aid:**

If exposed or concerned: Get medical advice or attention.

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Eye Contact: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.

Skin Contact: Wash with plenty of water.

Ingestion: Rinse mouth. Immediately call a POISON CENTER.

**EMERGENCY NUMBERS**

**Fire and Rescue: 911**

**Campus Police: (434)395-2091**

**Poison Control: (800)222-1222**

**Exposure Limits:** The Occupational Safety and Health Administration (OSHA) legal airborne permissible exposure limit (PEL) is 0.05 mg/m<sup>3</sup> averaged over an 8-hour work shift. The National Institute for Occupational Safety and Health (NIOSH) recommended exposure limit (REL) is 0.05 mg/m<sup>3</sup> averaged over a 10-hour work shift. Air concentrations should be maintained so that blood Lead is less than 0.06 mg per 100 grams of whole blood. The American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value (TLV) is 0.05 mg/m<sup>3</sup> averaged over an 8-hour work shift.

Lead is a probable carcinogen in humans and may be a teratogen in humans. There may be no safe level of exposure to a carcinogen, so all contact should be reduced to the lowest possible level.

**Routes of Exposure:** Lead may cause adverse health effects following exposure via inhalation, ingestion, dermal contact or eye contact.

**Signs and Symptoms of Exposure:** Short-term (acute) exposure to Lead may occur immediately or shortly after exposure and can cause headache, irritability, reduced memory, disturbed sleep, and mood and personality changes. Exposure can cause upset stomach, poor appetite, weakness and fatigue. Contact can irritate the eyes.

Chronic (long-term) health effects can occur at some time after exposure to Lead and can last for months or years.

Cancer Hazard: Lead is a probable carcinogen in humans. There is some evidence that Lead and Lead compounds cause lung, stomach, brain and kidney cancers in humans and they have been shown to cause kidney cancers in animals.

Reproductive Hazard: Lead may be a teratogen in humans since it is a teratogen in animals. It may decrease fertility in males and females, and damage the developing fetus and the testes.

Other Effects: repeated exposure to Lead can cause Lead poisoning. Symptoms include metallic taste, poor appetite, weight loss, colic, nausea, vomiting, and muscle cramps. High levels can cause muscle and joint pain, and weakness. High or repeated exposure may damage nerves causing weakness, "pins and needles", and poor coordination in the legs and arms. Lead exposure increases the risk of high blood pressure. Lead may cause kidney and brain damage, and damage to the blood cells causing anemia. Repeated exposure causes Lead to accumulate in the body. It can take years for the body to get rid of excess Lead

**Medical Testing:** Before exposure and every six months OSHA requires your employer to provide, (for persons exposed to 30 micrograms or more of Lead per cubic meter of air) a Lead blood test and ZPP. ZPP is a special test for the effects of Lead on blood cells.

For employees with blood Lead levels above 40 micrograms per 100 grams of whole blood, OSHA requires blood Lead level monitoring every two months until two consecutive blood levels are below 40 micrograms per 100 grams of whole blood. These employees must undergo a medical evaluation which should include: A complete work and medical history. Thorough physical examination, including examination of the central nervous system. Blood lead test and ZPP. Hemoglobin test with hematocrit with complete blood count. Urinalysis with microscopic

examination. Any other tests determined necessary by the examining physician. This evaluation should be performed at least annually.

OSHA requires your employer to provide you and your physician with a copy of the OSHA Lead Standards (29 CFR 1910.1025 and 1926.62). Any evaluation should include a careful history of past and present symptoms with an exam. Medical test that look for damage already done are not a substitute for controlling exposure. Request copies of your medical testing by contacting Longwood University's Department of Environmental Health and Safety (434)395-2940. You have the legal right to this information under the OSHA Access to Employee Exposure and Medical Records Standard (209 CFR 1910.1020).

Mixed exposures of Lead can be caused by hobbies using Lead solder or pigments, target practice, and drinking moonshine made in Leaded containers will increase Lead levels. Repeated breathing or handling of Leaded gasoline may also add to body Lead Levels.

**Workplace Controls and Practices:** Very toxic chemicals, or those that are reproductive hazards or sensitizers, require expert advice on control measures if a less toxic chemical cannot be substituted. Control measures include enclosing chemical processes for severely irritating and corrosive chemicals, using local exhaust ventilation (fume hoods) for chemicals that may be harmful with a single exposure, and using general ventilation to control exposure to skin and eye irritants. For further information on workplace controls contact Longwood University's Department of Environmental Health and Safety at (434)395-2490.

**Personal Protective Equipment:** The OSHA Personal Protective Equipment Standard (29 CFR 1910.132) requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are only guidelines and may not apply to every situation. Prior to using Lead consult Longwood University's Department of Environmental Health and Safety at (434)395-29040 or the manufacture's MSDS or SDS.

*Gloves and Clothing:* Avoid skin contact with Lead. Wear personal protective equipment made from material which cannot be permeated and/or degraded by this substance. Safety equipment manufactures recommend Nitrile, Latex, or Rubber gloves. All protective clothing should be clean, available each day and put on before working with Lead.

*Eye Protection:* Wear non-vented, Impact resistant goggles when working with fumes, gases, or vapors. For impact hazards (such as flying fragments, chips or particles), wear safety glasses with side shields or safety goggles. Wear a face shield along with goggles when working with corrosive, highly irritating or toxic substances.

Respiratory Protection: Always work with Lead in a fume hood.

**Spills and Emergencies:** If a Lead spill has occurred do not clean it up unless you have been properly trained by Longwood University's Department of Environmental Health and Safety. Call Campus Police at ext. 2091.

If you are trained to clean up a Lead spill take the following steps: Evacuate personnel and secure and control the entrance to the area. Eliminate all ignition sources. Collect spilled materials using a HEPA-filtered vacuum (DO NOT use a standard shop vac) or wet mop and deposit into a sealed container. Ventilate and wash area after clean-up is complete. Lead is a HAZARDOUS WASTE contact Longwood University's Department of Environmental Health and Safety for disposal.

**Handling and Storage:** Prior to working with Lead you should be trained on its proper handling and storage. A regulated, marked area should be established where Lead is handled, used and stored. Lead reacts violently with Hydrogen peroxide Ammonium nitrate, Zirconium, Sodium azide, Sodium acetylide, and Chlorine trifluoride. Lead is not compatible with Oxidizing Agents such as Perchlorates, Peroxides, Permanganates, Chlorates, Nitrates, Chlorine, Bromine and Fluorine. Lead is not compatible with strong Acids such as Hydrochloric, Sulfuric, and Nitric. Store in tightly closed containers in a cool, well-ventilated area.

**Work Area Preparation and Clean-up:** Always use a fume hood for your work area when using Lead. Ensure that the fume hood is working correctly. The digital read out on the fume hood should be between 60 to 100 linear feet per minute. Place a temporary covering, such as bench paper, in the fume hood. Place a sign on the hood:

**CAUTION LEAD WORK AREA**

**SEE (Add your name and phone number) FOR ENTRY**

When work with Lead is complete carefully roll up the temporary covering and place it in a hazardous waste container. Wet wipe the area and place the rags or paper towels in a hazardous waste container. Finally remove the sign. Work areas should be cleaned as soon as the work with Lead is complete.

**For more information, please contact:**

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