

Chemical Profiles

Lead

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What are other names or identifying information for lead?

CAS Registry No.: 7439-92-1

Other Names: Elemental Lead, Lead metal, Inorganic lead

Main Uses: Manufacture of many products including storage batteries and ammunition, in construction materials, in solders and alloys, etc.

Appearance: Blue - grey lustrous solid.

Odour: Odourless

Canadian TDG: Not specifically listed in Canadian TDG Regulations, but may be regulated as part of a chemical family or group Not Otherwise Specified (N.O.S.). Consult the regulations.

What is the WHMIS classification?

According to the Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST), [lead](#) can be classified as:

Carcinogenicity - Category 2

Reproductive toxicity - Category 1A

Reproductive toxicity (lactation) - Effects on or via lactation

Specific target organ toxicity - repeated exposure - Category 1



The signal word is danger.

The hazard statements are:

- Suspected of causing cancer
- May damage fertility or the unborn child
- May cause harm to breast-fed children

Please note that this classification was retrieved from the [CNESST](#) site on February 22, 2023 and was established by CNESST personnel to the best of their knowledge based on data obtained from scientific literature and it incorporates the criteria contained in the *Hazardous Products Regulations* (SOR/2015-17). It does not replace the supplier's classification which can be found on its Safety Data Sheet.

What are the most important things to know about lead in an emergency?

Emergency Overview: Blue - grey lustrous solid. Odourless. COMBUSTIBLE DUST. Dust may form explosive dust-air mixture. VERY TOXIC. Prolonged or repeated exposure causes damage to nervous system, kidneys, and blood if inhaled and/or ingested. SUSPECT CANCER HAZARD. Suspected of causing cancer. REPRODUCTIVE HAZARD. May damage fertility. TERATOGEN/EMBRYOTOXIN. May damage the unborn child. MUTAGEN. May cause genetic defects.

What are the potential health effects of lead?

Main Routes of Exposure: Inhalation. Skin contact. Eye contact. Ingestion.

- **Inhalation:** At high concentrations: can irritate the nose and throat.

- **Skin Contact:** Not irritating.
- **Eye Contact:** May cause slight irritation as a "foreign object". Tearing, blinking and mild temporary pain may occur as particles are rinsed from the eye by tears.
- **Ingestion:** Not expected to cause effects following short-term exposure. See Effects of Long-Term (Chronic) Exposure.
- **Effects of Long-Term (Chronic) Exposure:** VERY TOXIC. Can cause permanent damage to the nervous system. Symptoms may include restlessness, reduced ability to think, muscle tremors, memory loss and personality changes. In severe cases, symptoms may include muscle weakness, loss of feeling or prickly sensation in the hands, feet, arms or legs, clumsiness and paralysis. Can cause permanent damage to the kidneys. Kidney function tests may show abnormal results. In severe cases, symptoms may include fatigue, increased or decreased urination, nausea, and vomiting. May harm the blood. Can cause a decrease in the number or size of red blood cells (anemia). Blood tests may show abnormal results. In severe cases, symptoms may include paleness, fatigue, weakness, dizziness, confusion, shortness of breath and headache. Has been associated with: increased blood pressure.
- **Carcinogenicity:** Possible carcinogen. May cause cancer based on animal information.
 - International Agency for Research on Cancer (IARC): Group 2B - Possibly carcinogenic to humans. Note: Inorganic lead compounds are Group 2A - Probably carcinogenic to humans. Organic lead compounds are Group 3 -Not classifiable as to its carcinogenicity to humans.
 - American Conference for Governmental Industrial Hygienists (ACGIH): A3 - Confirmed animal carcinogen.
- **Teratogenicity / Embryotoxicity:** DEVELOPMENTAL HAZARD. May harm the unborn child. Known to cause: learning disabilities, effects on behaviour.
- **Reproductive Toxicity:** REPRODUCTIVE HAZARD. May cause reproductive effects in men and women. Has been associated with: reduced fertility.
- **Mutagenicity:** MUTAGEN. May cause genetic damage. Exposure of the parent may cause effects in children.

What are first aid measures for lead?

Inhalation: Take precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). Move victim to fresh air.

Skin Contact: Quickly take off contaminated clothing, shoes, and leather goods (e.g., watchbands, belts). Quickly and gently blot or brush away excess chemical. Wash gently and thoroughly with gently flowing water and non-abrasive soap. If irritation continues, get medical attention.

Eye Contact: Avoid direct contact. Wear chemical protective gloves if necessary. Immediately flush the contaminated eye(s) with large amounts gently flowing water occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Ingestion: Have victim rinse mouth with water. Get medical attention immediately.

First Aid Comments: If exposed or concerned, see a medical professional for advice. All first aid procedures should be periodically reviewed by a medical professional familiar with the chemical and its conditions of use in the workplace.

Note to Physicians: Some jurisdictions specifically regulate an ingredient of this product and require a complete medical surveillance program. Specific information should be sought from the appropriate government agency in your jurisdiction.

What are fire hazards and extinguishing media for lead?

Flammable Properties: Does not burn. (lead metal) COMBUSTIBLE DUST. Powder may form explosive dust-air mixture.

Suitable Extinguishing Media: Not combustible. Use extinguishing agent suitable for surrounding fire. (lead metal).

Specific Hazards Arising from the Chemical: In a fire, the following hazardous materials may be generated: very toxic lead oxides.

What are the stability and reactivity hazards of lead?

- **Chemical Stability:** Normally stable.
 - **Conditions to Avoid:** Generation of dust.
 - **Incompatible Materials:** Reacts violently with: strong acids (e.g. hydrochloric acid), when hot. Not corrosive to metals.
 - **Hazardous Decomposition Products:** None known.
 - **Possibility of Hazardous Reactions:** None known.
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What are unintentional release measures for lead?

Personal Precautions: Keep unnecessary and unprotected personnel out of spill area. Do not touch damaged containers or spilled product unless wearing appropriate protective equipment.

Methods for Containment and Clean-up: Small spills or leaks: collect using shovel/scoop or approved HEPA vacuum and place in a suitable container for disposal. Large spills or leaks: contact emergency services and manufacturer/supplier for advice.

Other Information: Report spills to local health, safety and environmental authorities, as required.

What handling and storage practices should be used when working with lead?

Handling: Avoid generating dusts. In event of a spill or leak, immediately put on escape-type respirator and exit the area. Good housekeeping is extremely important. Prevent dust accumulation on ALL surfaces including ceiling rafters and other hidden surfaces.

Storage: Store in an area that is: cool, dry, well-ventilated, out of direct sunlight and away from heat and ignition sources. Keep amount in storage to a minimum.

What is the American Conference of Governmental Industrial Hygienists (ACGIH®) recommended exposure limit for lead?

ACGIH® TLV® - TWA: 0.05 mg/m³ A3 BEI®

Exposure Guideline Comments: TLV® = Threshold Limit Value. TLV® = Threshold Limit Value. A3 = Animal carcinogen. BEI® = Biological Exposure Index.

Adapted from: 2022 TLVs® and BEIs® - Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices. Cincinnati: American Conference of Governmental Industrial Hygienists (ACGIH)

NOTE: In many (but not all) Canadian jurisdictions, the exposure limits are similar to the ACGIH® TLVs®. Since legislation varies by jurisdiction, contact your local jurisdiction for exact details. A list is available in the OSH Answers on [Canadian Governmental Occupational Health & Safety Departments](#).

A list of which acts and regulations that cover [exposure limits to chemical and biological agents](#) is available on our website. Please note that while you can see the list of legislation for free, you will need a subscription to view the actual documentation.

What are the engineering controls for lead?

Engineering Controls: Use a local exhaust ventilation and enclosure, if necessary, to control amount in the air. Use stringent control measures such as process enclosure to prevent product release into the workplace.

What Personal Protective Equipment (PPE) is needed when working with lead?

Eye/Face Protection: Wear chemical safety goggles.

Skin Protection: Wear chemical protective clothing e.g. gloves, aprons, boots.

Respiratory Protection:

Up to 0.5 mg/m³:

(APF = 10) Any air-purifying respirator with an N100, R100, or P100 filter (including N100, R100, and P100 filtering facepieces) except quarter-mask respirators; or Any supplied-air respirator.

Up to 1.25 mg/m³:(APF = 25)

Any supplied-air respirator operated in a continuous-flow mode; Any powered, air-purifying respirator with a high-efficiency particulate filter.

Up to 2.5 mg/m³

(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.

Click here for information on selection of N, R, or P filters; Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode; Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter; Any self-contained breathing apparatus with a full facepiece; Any supplied-air respirator with a full facepiece.

Up to 50 mg/m³:

(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Up to 100 mg/m³:

APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

APF = Assigned Protection Factor

Recommendations apply only to National Institute for Occupational Safety and Health (NIOSH) approved respirators. Refer to the [NIOSH Pocket Guide to Chemical Hazards](#) for more information.

General Hygiene Considerations: It is good practice to: avoid breathing product; avoid skin and eye contact. Wash hands after handling.

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