SAFETY DATA SHEET

Date of Issue: 6/06/2018
Issue No 4
Last revision: June 2018

1. IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY/ UNDERTAKING

1.1 Product Identifiers

Product Name: **LITHARGE**

EC # : 215-267-0
CAS # :1317-36-8
Product Code D0149

1.2 Other means of identification

Synonyms: Lead monoxide, Lead Oxide; Lead (II) oxide; lead oxide yellow; litharge; massicot, Pigment yellow 46.

Chemical Family: Lead monoxide mixture

1.2.1 Relevant identified uses of the substance

Fire assay flux for analysis of gold.

1.2.2 Uses advised against

None

1.3. Details of the supplier of the safety data sheet

PERTH:
Klen International (74) Pty Ltd;
36 Hemisphere Street
Neerabup WA 6031
EMAIL: info@klen.com.au
ABN: 25 008 776 681
FAX: (+618) 9306 8922
TEL: (+618) 9306 8900

CONTACT POINT - Chemist - TELEPHONE (+618) 9306 8900
EMERGENCY TELEPHONE NUMBER: A/H (+61) 417 188 935

2. HAZARDS IDENTIFICATION

2.1 GHS Classification:

Reproductive Toxicity Category 1A
Acute Toxicity Inhalation Category 4
Acute Toxicity Oral Category 4
Specific Target Organ Toxicity – repeated exposure (Category 2)
Acute Aquatic Toxicity Category 1
Chronic Aquatic Toxicity Category 1
Specific Concentration Limits: C>= 2.5% (Repr. 2; H361f); C>=0.5% (STOT RE 1; H372); C>=0.05% (STOT RE 2; H373)

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2.2 GHS Label elements, including precautionary statements .

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Pictograms:

Signal word : **DANGER**

Hazard Statements:

H302 Harmful if swallowed.
H360Df May damage the unborn child. Suspected of damaging fertility.
H332 Harmful if inhaled.
H372 Causes damage to central nervous system, blood and kidneys through prolonged or repeated exposure by inhalation or ingestion..
H410 Very toxic to aquatic life with long lasting effects

Precautionary statements
P201: Obtain special instructions before use
P260: Do not breathe dust
P264: Wash exposed skin thoroughly after handling
P273: Avoid release to the environment
P301+312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
P304+340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
P308+313: IF exposed or concerned: Get medical advice/attention
P391: Collect spillage.
P405: Store locked up
P501: Dispose of contents/container in accordance with local/regional/national regulations.

2.3 Other Hazards
None

3. COMPOSITION AND INFORMATION ON INGREDIENTS

CAS No	Ingredient	Percent	EC No	Conc Cutoff	Classfn
1317-36-8	Lead Oxide	99.5 - 100	215-267-0	C>= 2.5%	Repr.2: H361f
				C >= 0.5%	STOT RE 1; H372
				C>=0.05%	STOT RE 2; H373

Chemical Formula: PbO
Molecular Weight: 223.20
Index Number: 082-001-00-6
Product Use: fire assay flux, typically for the analysis of gold in ore bodies.
Particle Size: powder grade – less than 45 microns, granular grade - between 0.65 - 1.41 mm.
General: This is a commercial product and may contain small amounts of water (<0.5%), silica <0.1%) and other trace elements.

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4. FIRST AID MEASURES

General Advice
Consult a physician. Show this safety data sheet to the doctor in attendance.

If Inhaled
If breathed in, move person into fresh air. If breathing difficulty or discomfort occurs and persists consult a physician.

In case of skin contact
Wash off with soap and plenty of water. If irritation occurs and persists consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes. . If irritation occurs and persists consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician**.**

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

5. FIRE FIGHTING MEASURES

Fire: Not considered to be a fire hazard.
Explosion: Not considered to be an explosion hazard.
Fire Extinguishing Media: Use any means suitable for extinguishing surrounding fire. Do not allow water runoff to enter sewers or waterways.
Special Information: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Can produce toxic lead fumes at elevated temperatures and also react with oxidizing materials.

6. ACCIDENTAL RELEASE MEASURES

Keep unnecessary people away and isolate hazard area.
Ventilate area of spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming (with a HEPA filter) or wet sweeping may be used to avoid dust dispersal. Do not flush to sewer or waterways.

7. HANDLING AND STORAGE

Store in accordance with all local, state and federal regulations relating to the storage and handling of toxic substances.
Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Areas in which exposure to lead metal or lead compounds may occur should be identified by signs or appropriate means, and access to the area should be limited to authorized persons. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

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8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

8.1 Control parameters

Exposure Limits: Lead, metal and inorganic dusts and fumes, as Pb:

NOHSC: TWA 0.15 mg/m^3; STEL: not listed.
OSHA PEL: TWA 0.05 mg/m^3 ; STEL: not listed
ACGIH TLV: TWA 0.05 mg/m^3; STEL not listed; Biological Exposure Indices (BEI): 30 ug/100ml, notation B (see actual Indices for more information).
NIOSH REL:TWA 0.1 mg/m^3; STEL not listed
DFG-MAK: TWA 0.1 mg/m^3; STEL 1.0 mg/m^3(once/ shift, 30 minutes)

8.2 Exposure Controls

Engineering and Ventilation Controls: Basic aspects of equipment and facility design should be such that lead emissions that may contribute to occupational exposures are minimised. Such measures may include enclosure of process equipment such that sources of dust or aerosol emissions are minimised, negative draft exhaust systems to reduce emissions from enclosures and/or local exhaust ventilation installed at unavoidable sources of process emissions. The design characteristics of any local exhaust ventilation (e.g. exhaust hoods) will be specific to the emission source being controlled. Area ventilation should also be balanced such that air flow within a work area moves from areas of low to high exposure potential. Air captured by ventilation controls may require treatment to minimise toxic substances prior to discharge or recirculation.

Personal Respirators: If the exposure limit is exceeded, a half-face high efficiency dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece high efficiency dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection: Use chemical safety goggles and/or full-face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Cleaning: Ensure general shop cleanliness is maintained by frequent washing/vacuuming. Clean every workplace at the end of every shift.

Personal protective equipment: Assess the need to wear respiratory protective equipment in production areas. Consider use effective masks accompanied by a compliance policy (ensure proper shaving; ensure workers do not remove RPE in production areas in order to communicate). Where masks are used, employ formal mask cleaning and filter changing strategies; For workers in areas of significant exposure, provide sufficient working clothes to enable daily change into clean clothes. In such cases all work clothing should be cleaned by the employer on a daily basis and is not permitted to leave the work site.

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Personal hygiene: Ensure workers follow simple hygiene rules (e.g. do not bite nails and keep them cut short, avoid touching or scratching face with dirty hands or gloves); Ensure workers do not wipe away sweat with hands or arms, e.g. by providing disposable perspiration towels; Ensure workers use disposable tissues rather than a handkerchief; Prohibit drinking, eating and smoking in production areas; Prevent access to eating and nonproduction areas in working clothes; Ensure workers as a minimum wash hands, arms, faces and mouths (but preferably shower) and change into personal clothing (or clean coveralls provided by the company) before entering eating areas; For high exposure workplaces, at the end of a shift, workers may need to pass through a room containing washbasins for the cleaning of hands, followed by a 'dirty' room for the removal of working clothes, then through showers into a 'clean' room for changing into personal clothing; Ensure workers handle dirty working clothes with care; Consider making showering obligatory at the end of a shift, and provide towels and soap; Allow no personal belongings to be taken into production areas, and allow no items that have been used in production areas to be taken home.

Blood lead monitoring: Set in place a monitoring regime which covers all site activities (for women and for men); Use certified laboratories to measure blood lead levels or have own laboratory certified; Consider benchmarking with other companies/sectors; Define a policy for submitting workers to blood lead monitoring, including increased frequency for workers undertaking high-risk jobs and workers with elevated blood lead levels; Ensure all workers have a blood test prior to working on site. The blood lead levels of workers will be monitored on a regular basis, often in reference to an "action level" that is typically 5 µg/dL below the exposure limit deemed to be safe. If the action level is exceeded, appropriate measures are to be taken, (e.g. ban overtime, provide counselling on proper work practice and hygiene, instigate an individual blood lead management plan, increase blood lead sampling frequency) in an effort to prevent further increases in blood lead. If the safe threshold (40 µg/dL for men; 10 µg/dL for women) is exceeded, continue ban on overtime, ensure strict hygiene procedures are followed, undertake detailed inspections to ensure correct use of personal protective equipment, undertake detailed inspections to ensure recommended workplace procedures are followed, move employee to workplace where exposure is expected to be lower or remove from lead environment altogether, further increase blood lead sampling frequency, and continue frequent sampling until results are below the first action level.

Creating a culture of safety: Define and communicate a clear policy for controlling occupational exposure to lead; Ensure managers set the example in terms of personal protection and hygiene; Where possible involve occupational physicians in making workers take control of their own blood lead levels; Consider making low blood lead levels a condition of employment, with disciplinary action taken where protective equipment and hygiene procedures are not followed; Involve managers when workers' blood lead levels exceed action levels; Consider publicising company blood lead performance to workers via notices and briefings to ensure the topic remains a key priority; Provide detailed training for new personnel on the risks of lead exposure and the procedures for protection; Provide instruction on specific lead exposure risks for workers undertaking new tasks; Provide regular refresher courses for all employees on the risks of lead exposure and the procedures for protection; Involve worker representatives.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Tan, orange or yellow powder or granules (yellow form stable above 489^{o}C).
Odour: Odourless.
Solubility: Insoluble in water (70.2 mg/L water). Soluble in acetic acid, nitric acid and alkali
Specific Gravity: 9.96
pH: Strong base
% Volatiles by volume @ 20^{o}C: <0.5
Boiling Point: 1477ºC.
Melting Point: 888ºC
Vapour Density (Air=1): Not applicable.
Vapour Pressure (mm Hg): Negligible at 25C (10 at 1085ºC)
Evaporation Rate (BuAc=1): Not applicable.
Granulometry: Mean particles size (laser diffraction method): D50 = 6 µm.

10. STABILITY AND REACTIVITY

Stability: Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products: Toxic metal fumes may form when heated to decomposition.
Hazardous Polymerization: Will not occur.
Incompatibilities: Hydrogen peroxide, lithium carbide, chlorine, ethylene, fluorine, sulfides, acetylides, aluminium, strong reducing agents, combustible materials, chemically active metals.
Conditions to Avoid: Heat, flames, ignition sources and incompatibles.

11. TOXICOLOGICAL INFORMATION

Potential Health Effects
Inhalation: This is the most likely exposure route. Lead can be absorbed through the respiratory system. Local irritation of bronchia and lungs can occur and, in cases of acute exposure, symptoms such as metallic taste, chest and abdominal pain, and increased lead blood levels may follow. See also Ingestion.
Ingestion: POISON! The symptoms of lead poisoning include abdominal pain and spasms, nausea, vomiting, headache. Acute poisoning can lead to muscle weakness, “lead line” on the gums, metallic taste, definite loss of appetite, insomnia, dizziness, high lead levels in blood and urine with shock, coma and death in extreme cases.
Skin Contact: Lead and lead compounds may be absorbed through the skin on prolonged exposure; the symptoms of lead poisoning described for ingestion exposure may occur. Contact over short periods may cause local irritation, redness and pain. Acute dermal toxicity would not be expected from lead oxide exposure. Skin sensitisation has not been reported.
Eye Contact: Absorption can occur through eye tissues but the more common hazards are local irritation or abrasion.

Chronic Exposure: Lead is a cumulative poison and exposure even to small amounts can raise the body’s content to toxic levels. The symptoms of chronic exposure are like those of ingestion poisoning; restlessness, irritability, visual disturbances, hypertension and grey facial colour may also be noted.
Aggravation of Pre-existing Conditions: Persons with pre-existing kidney, nerve or circulatory disorders or with skin or eye problems may be more susceptible to the effects of this substance.

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Litharge: Acute Toxicity: Oral (dog) lowest LD 1400 mg/kg. Human studies summarised in IUCLID indicate low toxicity of lead oxide via the oral route (LD50 > 2000 mg/kg/bw). Intraperitoneal: rat lowest LD 430 mg/kg.
Skin (rabbit, adult) 100mg/24h MLD. Inhalation (human, for Lead) TCLo 10 mg/m^3 gastrointestinal effects.
Inhalation (rat) lowest toxic concentration 10 $ug.m^3/24h/22wk$ continuous. Investigated as a tumorigen and mutagen.

Reproductive Toxicity: Lead and other smelter emissions are human reproductive hazards (Chemical Council on Environmental Quality; Chemical Hazards to Human Reproduction, 1981). EC regulations for lead compounds: Repr. Cat.1; Repr. Cat.3 (Table 3.2) and Repr. 1A (Table 3.1)

Carcinogenicity: For lead and inorganic lead compounds: EPA / IRIS classification: Group B2 – Probable human carcinogen, sufficient animal evidence. IARC Category 2B; ACGIH category A3. Not listed by the NTP and NIOSH.

12. ECOLOGICAL INFORMATION

Water Solubility: The solubility of lead monoxide in cold water is 70 mg/L. Soil mobility is expected to be low.

Most of the ecological data is obtained from more soluble lead compounds.

Lead and its compounds have high acute and chronic toxicity to aquatic life. Lead causes nerve and behavioral effects in humans and could cause similar long-term effects in birds and land animals exposed to lead and its compounds.

Environmental Toxicity: No information found for lead monoxide. However soluble lead compounds such as lead nitrate cause long-term effects in the aquatic environment. In the food chain important to humans, bioaccumulation takes place, specifically in marine and terrestrial organism. Bioaccumulation/bioconcentration factors in freshwater: 1,553 L/kg (wet weight); and in soil: 0.39 kg/kg (dry weight).

Distribution and Persistence in the Environment: Lead and its compounds are highly persistent in water, with a half-life greater than 200 days.

Partitioning coefficients for lead suspended particulate matter: Fresh water: median log KD,SPM value of 5.47; Estuarine: median log KD,SPM value of 5.83; marine: median log KD,SPM of 6.18 (Chemical Safety Report to Reach, 2010)

13. DISPOSAL.

13.1 Waste treatment methods

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Dispose of container and unused contents in accordance with federal, state and local requirements. Empty bags should stacked and packed into sealed drums for disposal

14. Transport Information

14.1 UN Number

ADR/RID : 2291 IMDG : 2291 IATA-DGR: 2291

14.2 UN Proper Shipping Name

ADR/RID: Lead Compound, Soluble, N.O.S. (Lead Monoxide)
IMDG: Lead Compound, Soluble, N.O.S. (Lead Monoxide)
IATA-DGR: Lead Compound, Soluble, N.O.S. (Lead Monoxide)

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14.3 Transport hazard class(es)

ADR/RID: 6.1 IMDG: 6.1 IATA-DGR: 6.1

14.4 Packaging group

ADR/RID: III IMDG: III IATA-DGR: III

14.5 Environmental Hazards

ADR/RID: no IMDG Marine pollutant: yes IATA-DGR: no

14.6 Special precautions for user

No data available

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15. Regulatory Information

Chemical Inventory Status for lead oxide (1317-36-8: Listed by Australia, TSCA, Japan, EC, Korea, Canada, Philippines
TSCA (SARA Title III) Status: Listed. RTECS Number: OG1750000
Australian Hazchem Code: 2Z; Poison Schedule: S6

16. Other Information

The above information is accurate to the best of the knowledge available to us. However since data safety standards and government regulations are subject to change and the conditions of handling and use, or misuse are beyond our control we make no warranty, whether express or implied, with respect to the completeness or continuing accuracy of the information contained herein and disclaims all liability for reliance thereon. Users should satisfy themselves that they have all current data relevant to their particular use.