SAFETY DATA SHEET

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This Safety Data Sheet is provided in compliance with EC Regulations 1907/2006, 1272/2008, 2015/830 and 2020/878 (REACH)

SECTION 1: Identification of the substance/mixture and of the company/ undertaking

1.1 Product identifier: LITHARGE

1.2. Relevant identified uses of the substance or mixture and uses advised against
Relevant identified uses: Fire assay flux for analysis of gold.
Uses advised against: none.
Chemical Family: Lead monoxide mixture

Other means of Identification: Lead monoxide, Lead Oxide; Lead (II) oxide; lead oxide yellow; litharge; massicot, Pigment yellow 46.

1.3. Details of the Supplier of the Safety Data Sheet

Manufacturer: Klen International (74) Pty Ltd;
36 Hemisphere Street
Neerabup WA 6031
Email: info@klen.com.au
ABN: 25 008 776 681

1.4 Emergency Telephone Number

Tel: (+618) 9306 8900
Contact Point - Chemist - Tel (+618) 9306 8900
EMERGENCY TELEPHONE: A/H (+61) 417 188 935

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

2.1.1 Classification according to Regulation (EC) No. 1272/2008 [CLP]

Hazard Classes and Hazard Categories	*Hazard Statements*
Acute Toxicity Category 4 (oral)	H302
Acute Toxicity Category 4 (inhalation)	H332
Reproductive Toxicity Category 1A	H360
STOT RE Category 2	H373
Aquatic Toxicity Chronic Category 1	H410

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2.2 Label elements

Signal word: Danger

Hazard statements:

Number	*Statement*
H302	Harmful if swallowed.
H332	Harmful if inhaled.
H373	Causes damage to organs through prolonged or repeated exposure.
H360Df	May damage the unborn child. Suspected of damaging fertility
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
P280	Wear protective gloves/protective clothing/eye protection/face protection
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
P305 + P351 + P338	IF IN EYES, rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
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/international regulations

2.3 Other Hazards

This is a substance of very high concern (SVHC) and is included in the Candidate List according to Article 59(1) of REACH:

- **Lead (II) oxide (ED/169/2012)**

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SECTION 3. Composition/Information on Ingredients

Substance Name	*Concentration,%*	*Product Identifier*	*Hazard Classes and Hazard Categories*
Lead (II) oxide	<=100	CAS No. 1317-36-8 EC No. 215-267-0 REACH Regn: 01-2119531110-62-0053	Acute Tox. 4, H302 Acute Tox. 4, H332 Repr 1A, H360 STOT RE 2; H373 Aquatic Chronic 1, H410

Substance Name	*Specific Concentration Limit*	*M Factor*	*Notes*
Lead (II) oxide	Repr. 1A (H360): C >=2.5% STOT RE 2 (H373): C>=0.05%	10 (acute) 1 (chronic)	Note 1

Note 1: The concentration stated or, in the absence of such concentrations, the generic concentrations of this Regulation or the generic concentrations of Directive 1999/45/EC, are the percentages by weight of the metallic element calculated with reference to the total weight of the mixture.

General: This is a commercial product and may contain small amounts of water (<0.5%), and other trace elements.

SECTION 4. First Aid Measures

4.1 Description of first aid measures

General Advice: Show this safety data sheet to the doctor in attendance. Immediate medical attention is required.

Following inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Following ingestion: Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Following skin contact: Immediately flush skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Following eye contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.
Self-protection of the first aider: Avoid inhalation. Wash affected areas.

4.2 Most important symptoms and effects, both acute and delayed

Inhalation: This is the most likely exposure route. Dust 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. Dust may cause irritation or soreness of throat and nose. See also Ingestion.
Ingestion: 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. Bloating may be caused by release of carbon dioxide by the action of stomach acids on carbonate components.
Skin Contact: 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.
4.3 Indication of any immediate medical attention and special treatment needed
See section 11.

SECTION 5. Fire-fighting measures

5.1 Extinguishing media
Fire Extinguishing Media: Use any means suitable for extinguishing surrounding fire.
Unsuitable extinguishing media: no restriction.
5.2 Special hazards arising from the substance or mixture
Hazardous combustion products: Can produce toxic lead fumes at elevated temperatures.
5.3 Advice for firefighters
Fire: Not considered to be a fire hazard.
Explosion: Not considered to be an explosion hazard.
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.

SECTION 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
6.1.1. For non-emergency personnel
Wear suitable protective equipment (including personal protective equipment referred to under Section 8) to prevent any contamination of skin, eyes and personal clothing;
Avoid dust dispersal by minimising ventilation.
Emergency procedures: Keep unnecessary people away and isolate hazard area. Consult an expert.
6.1.2. For emergency responders
Wear appropriate personal protective equipment as specified in Section 8.
6.2 Environmental precautions
Spills: Do not flush to sewer or waterways.
6.3 Methods and material for containment and cleaning up
Control dust: Sweep up and containerize for reclamation or disposal. Vacuuming (with a HEPA filter) or wet sweeping may be used to avoid dust dispersal. Don't use a brush or compressed air for cleaning surfaces or clothing.
6.4 Reference to other sections. See sections 8 and 13.

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SECTION 7. Handling and Storage

7.1 Precautions for safe handling

Protective measures: Handling should only be by authorised personnel.
Measures to prevent fire: Not applicable
Measures to prevent aerosol and dust generation: Use enclosed automatic dosing in a dedicated area.
Measures to protect the environment: No not store or handle outside designated areas.
Advice on general occupational hygiene: Were protective equipment when handling. Do not smoke eat or drink when handling.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures and storage conditions: Store in accordance with all EU, national and local regulations relating to the storage and handling of toxic substances.
Packaging materials: 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.
Requirements for storage rooms and vessels: Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage.
Storage class: 6.1
Further information on storage conditions: Isolate from incompatible substances.

7.3 Specific end use(s):

Recommendations: 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.
Industrial sector specific solutions: Refer also to REACH Exposure Scenario: Use of lead oxides and lead metal as an analytical reagent in the analysis of precious metals

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SECTION 8. Exposure controls / Personal protection

Refer also to REACH Exposure Scenario: Use of lead oxides and lead metal as an analytical reagent in the analysis of precious metals

8.1 Control parameters

8.1.1 Exposure Limits:

Lead, metal and inorganic dusts and fumes, as Pb: Austria TWA 0.1 mg/m3; Bulgaria TWA 0.05 mg/m3; Denmark TWA 0.05 mg/m3, BEV 20 µg/dL; Estonia TWA 0.1 mg/m3; France TWA 0.1 mg/m3; Hungary TWA 0.15 mg/m3 (0.05 resp); Ireland TWA 0.15 mg/m3, BLV 70 µg/dL; Spain 70 µg/dL; Sweden TWA 0.1 mg/m3 (0.05 resp); Switzerland TWA 0.1 mg/m3, VBT (m+f >45y) 40 µg/dL, VBT (f<40y) 10 µg/dL; UK TWA 0.15 mg/m3

8.2 Exposure controls

8.2.1 Appropriate engineering 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.

8.2.2 Personal protection equipment:
8.2.2.1 Eye and face protection: Use chemical safety goggles and/or full-face shield where dusting is possible. Maintain eye wash fountain and quick-drench facilities in work area
8.2.2.2 Skin protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact
8.2.2.3 Respiratory protection: If the exposure limit is exceeded, a full-face piece high efficiency dust/mist respirator is recommended
8.2.2.4Thermal hazards:
8.2.3 Environmental exposure controls:
Substance/ mixture related measures to prevent exposure: No information.
Instruction measures to prevent exposure: Wear protective clothing. Shower before eating or leaving area.
Organisational measures to prevent exposure: Frequently update and refresh job instructions.
Technical measures to prevent exposure: Cleaning: Ensure general shop cleanliness is maintained by frequent washing/vacuuming. Clean every workplace at the end of every shift.

SECTION 9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties
(a) Physical state
(b) Colour: Mixture of red or reddish yellow and white powders.
(c) Odour: Slight oily odour.
(d) Melting point / Freezing point: Lead monoxide: 888ºC;.
(e) Boiling Point: No information found.
(f) Flammability (solid, gas): Not flammable
(g) Upper/lower flammability or explosive limits: not applicable
(h) Flash Point: not applicable
(i) Auto-ignition temperature: not applicable
(j) Decomposition temperature: no data
(k) pH: 1% solution: 11 approx.
(l) Kinematic Viscosity: not applicable
(m) Solubility: Partially soluble in water. Partially soluble in acetic acid, nitric acid and alkali
(n) Partition coefficient: n-octanol/water: no data
(o) Vapour pressure : not applicable
(p) Relative density 9.96
(q) Vapour Density (Air=1): No data.
(r) Decomposition temperature: No data
(s) Particle characteristics:

Lead monoxide powder grade – less than 45 microns, granular grade - between 0.65 - 1.41 mm.

SECTION 10. Stability and Reactivity

10.1 Reactivity: Not chemically reactive at room temperature.
10.2 Chemical stability: Under storage at normal ambient temperatures (minus 40° C to + 40° C), the product is stable.
10.3 Possibility of hazardous reactions: Mixture will not react or polymerise, or release excess pressure or heat, or create other hazardous conditions
10.4 Conditions to avoid: Heat, flames, ignition sources and incompatibles
10.5 Incompatible materials: Acids, strong reducing agents.

10.6 Hazardous decomposition products: Toxic lead fumes will form when heated.

SECTION 11. Toxicological Information

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.

(a) Acute toxicity;

Oral	Human studies summarised in in IUCLID indicate low toxicity of lead oxide via the oral route (LD50 > 2000 mg/kg/bw). Intraperitoneal: rat lowest LD 430 mg/kg
Dermal	Skin (rabbit, adult) 100mg/24h MLD
Inhalation	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.

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
Lead (II) oxide	> 10000 mg/kg (rat)	> 2000 mg/kg (rat)	> 5.05 mg/L (rat) 4h

(b) **Skin corrosion/irritation** no data available
(c) **Serious eye damage/ irritation** no data available
(d) Respiratory or skin sensitisation;
Respiratory no data available
Skin no data available
(e) **Germ cell mutagenicity;** no data available
(f) 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.

The table below indicates whether each agency has listed any ingredient as a carcinogen:

Component	EU	UK	Germany	IARC
Lead Oxide (PbO)				Group 2A

(g) Reproductive Toxicity;
Reproductive Effects

Lead containing compounds are considered to be reproductive and developmental toxins. (Chemical Council on Environmental Quality; Chemical Hazards to Human Reproduction, 1981). EC regulations for lead compounds: Repr. Cat.1; Repr. Cat.3 (CLP Annex VI 3.2) and Repr. 1A (CLP Annex VI 3.1)

Developmental Effects May cause harm to the unborn child

(h) **STOT – single exposure** no data available
(i) **STOT - repeated exposure** no data available

	Target Organs	Blood, Central Nervous System (CNS), Peripheral Nervous System (PNS), kidneys
(j)	Aspiration hazard;	Not applicable Solid

11.2. Information on other hazards

Endocrine disrupting properties: This product does not contain any known or suspected endocrine disruptors.

SECTION 12. Ecological Information

12.1 Toxicity: Aquatic toxicity: Bioaccumulation/bioconcentration factors for lead in freshwater: 1,553 L/kg (wet weight); and in soil: 0.39 kg/kg (dry weight).

12.2 Persistence and degradability: The solubility of lead monoxide in cold water is 70 mg/L. BDistribution and Persistence in the Environment: Lead and its compounds are highly persistent in water, with a half-life greater than 200 days.

12.3 Bioaccumulative potential: 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 (REACH Chemical Safety Report, 2010). Bioaccumulation/ bioconcentration factors in freshwater: 1,553 L/kg (wet weight); and in soil: 0.39 kg/kg (dry weight).

12.4 Mobility in soil: Lead Soil mobility is expected to be low.

12.5 Results of PBT and vPvB assessment: PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

12.6 Endocrine disrupting properties:

12.7 Other adverse effects: Environmental Toxicity. No information found for lead monoxide. However lead causes nerve and behavioural effects in humans and could cause similar long-term effects in birds and land animals exposed to lead and its compounds.

SECTION 13. Disposal Considerations

13.1 Waste treatment methods

13.1.1 Product / Packaging disposal: Empty bags should be stacked and packed into sealed drums for disposal. Consider recycling this product to lead manufacturers. Dispose of container and unused contents in accordance with EU, national and local requirements

13.1.2 Waste treatment-relevant information: Waste product. It is recommended that this be collected and sent to lead smelters for recycling.

13.1.3 Sewage disposal-relevant information: Do not dispose to sewage.

13.1.4 Other disposal recommendations: no data

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SECTION 14. Transport Information

Land transport (ADR/RID)

14.1 UN-No.: 2291
14.2 Proper Shipping Name: LEAD COMPOUND, SOLUBLE, N.O.S.
14.3 Class(es): 6.1
Classification code: T5
14.4 Packing group: III
14.5 Environmental hazards: Dangerous for the environment
14.6 Special precautions for user:
Hazard identification number (Kemler No.): 60
Tunnel restriction code: E (Passage forbidden through tunnels of category E.)

Sea transport (IMDG)

14.1 UN-No.: 2291
14.2 Proper Shipping Name: LEAD COMPOUND, SOLUBLE, N.O.S.
14.3 Class(es): 6.1
14.4 Packing group: III
14.5 Environmental hazards: Dangerous for the environment
MARINE POLLUTANT: Yes (P)
14.6 Special precautions for user:
Storage: Category A;
Segregation group: 7,9
EmS-No. F-A; S-A

14.7 Maritime transport in bulk according to IMO instrument; not relevant – packaged goods.

Air transport (ICAO-TI / IATA-DGR)

14.1 UN-No.: 2291
14.2 Proper Shipping Name: LEAD COMPOUND, SOLUBLE, N.O.S.
14.3 Class(es): 6.1
Classification code: T5
14.4 Packing group: III
14.5 Special precautions for user: No information
Hazchem Code: 2Z

15. Regulatory Information

Chemical Inventory Status for lead oxide (1317-36-8): Listed on EINECS and Australia, TSCA, Japan, Korea, Canada, Philippines. TSCA (SARA Title III) Status: Listed. RTECS Number: OG1750000. REACH: this substance is registered according to Regulation (EC) No. 1906/2006 (01-2119531110-62-0053)

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.