SAFETY DATA SHEET

Date of Issue: 17/08/2020
Issue No 1
Last revision: August 2020

1. Identification of the Substance / Preparation and the Company / Undertaking

Product Name: **FLUX ALS BC1G SILVER**
Product Use: Fire assay flux for analysis of gold
Product Code: M1293
Chemical Family: Lead monoxide mixture

Company/undertaking identification:
Manufacturer:
Klen International (74) Pty Ltd;
36 Hemisphere Street
Neerabup WA 6031
Email: info@klen.com.au
ABN: 25 008 776 681
Tel: (+61) 8 9306 8900
Contact Point - Chemist - Tel (+61) 8 9306 8900
EMERGENCY TELEPHONE: A/H (+61) 417 188 935

SECTION 2. Hazards Identification

2.1 Classification of the substance

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

Acute Toxicity Category 4 (oral)	H302
Eye Irritant. Category 2	H319
Acute Toxicity Category 4 (inhalation)	H332
Reproductive Toxicity Category 1A	H360
STOT RE Category 2	H373
Aquatic Toxicity Chronic Category 1	H410

2.1.2 Classification according to Directive 67/548/EEC

Xn; R20/22 (harmful by inhalation and if swallowed)
R33 (Danger of cumulative effects)
Repr. Cat. 1; R61 (May cause harm to the unborn child)
Repr.Cat. 3; R62 (Possible risk of impaired fertility)
N; R50/53 (Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment)

2.2 Label elements

Labelling according to Regulation (EC) No. 1272/2008 (CLP)

Hazard pictograms

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Signal word: Danger

Hazard statements:

H302 Harmful if swallowed.
H319 Causes serious eye irritation
H332 Harmful if inhaled.
H360 May damage fertility or the unborn child.
H373 Causes damage to organs through prolonged or repeated exposure.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements

P260 Do not breathe dust
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
P501 Dispose of contents/container in accordance with local/regional/national/international regulations

Supplemental Hazard Information: This mixture contains the following substances of very high concern (SVHC) which are included in the Candidate List according to Article 59 of Reach:

- Lead (II) oxide (ED/169/2012)
- Di-Sodium tetraborate (ED/30/2010)

SECTION 3. Composition/Information on Ingredients

Substance Name	*Concentration, %*	*Product Identifier*	*Hazard Classes and Hazard Categories*
Lead (II) oxide	30-60	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
Sodium Carbonate	10-30	CAS No. 497-19-8 EC No. 207-838-8 Reach Regn. 01-2119485498-19	Eye Irrit. 2, H319
di-Sodium tetraborate	10-30	CAS No. 1330-43-4 EC No. 215-540-4 Reach Regn: 01-2119490790-32	Repr. 1B; H360FD
Silica	<10	CAS No. 14808-60-7 EC No. 238-878-4	inhalation hazard

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Ingredients either below cut off levels or not classified in Annex VI

Substance Name	*Concentration, %*	*Product Identifier*	*Hazard Classes and Hazard Categories*
Flour	<2	Not listed	Not listed
White Mineral Oil	<2	CAS No. 92062-35-6 EC No. 295-550-3	Asp. Tox. 1; H304
Silver Nitrate	<0.1	CAS No. 7761-88-8 EC No. 231-853-9	Ox. Sol. 2; H272. Skin Corr. 1B; H314. Aquatic Acute 1; H400. Aquatic Chronic 1; H410

Product Use: fire assay flux, typically for the analysis of gold in ore bodies.
Particle Size: Lead monoxide powder grade – less than 45 microns, granular grade - between 0.65 - 1.41 mm.
Sodium Carbonate -Typical - 85% passing 1 micron
Sodium Tetraborate – Typical – 70% retained on 30 mesh
General: This is a commercial product and may contain small amounts of water (<0.5%), and other trace elements.

SECTION 4. First Aid Measures

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion: Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
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.
Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

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. Excessive contact may cause irritation, blistering and redness because of the alkalinity of the formulation.
Eye Contact: Alkaline content may be corrosive to eyes and cause conjunctival oedema and corneal destruction. Absorption of lead can occur through eye tissues. Common hazards are local irritation or abrasion.

4.3 Indication of any immediate medical attention and special treatment needed

See section 11.

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SECTION 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.

SECTION 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.

SECTION 7. Handling and Storage

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

Store in accordance with all EU, national and local 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.

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

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

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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

Sodium Tetraborate, anhydrous: WEL TWA (UK) 1 mg/m3. NOHSC (Borates, Tetrasodium salt): TWA: 1 mg/m^3; STEL: Not Assigned. - NIOSH (REL): 1 mg/m3 (TWA). ACGIH (TLV): 5 mg/m3 (TWA)

Silica dust, crystalline: UK WEL Silica, respirable TWA 0.1mg/m3 (HSC/E plans to keep this crystalline limit under review). US TLV 0.1 mg/m3 (Respirable dust guideline). NOHSC: Silica, Crystalline (Quartz) (CAS 14808-60-7): TWA 0.1 mg/m^3; STEL: Not assigned.

Silver, soluble compounds (as Ag): WEL and NOHSC: Silver, soluble compounds (as Ag): TWA: 0.01 mg/m^3.

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 full-face piece high efficiency dust/mist respirator is recommended.

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 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.

SECTION 9. Physical and Chemical Properties

Appearance: Mixture of red or reddish yellow and white powders.
Odour: Slight oily odour.
Solubility: Partially soluble in water. Partially soluble in acetic acid, nitric acid and alkali
Specific Gravity: 5.3
pH: 1% solution >11
% Volatiles by volume @ 21ºC: 1
Boiling Point: No information found.
Melting Point: This is a mixture. Major melting points are Sodium Carbonate: 815ºC; Lead monoxide: 888ºC; Silica >1698ºC.
Vapour Density (Air=1): No data.
Vapour Pressure (mm Hg): No data
Evaporation Rate (BuAc=1): No data.

SECTION 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.

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Hazardous Polymerization: Will not occur.
Incompatibilities: Acids, 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.

SECTION 11. Toxicological Information

The flux mixture has not been tested for its health effects as a whole, and relevant information from individual substances has been compiled from the individual health effects of the components:

Potential Health Effects

Acute:

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: 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. 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. Excessive contact may cause irritation, blistering and redness because of the alkalinity of the formulation.

Eye Contact: Alkaline content may be corrosive to eyes and cause conjunctival oedema and corneal destruction. Absorption of lead can occur through eye tissues. 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.

Lead and boron containing compounds are considered to be reproductive and developmental toxins. Prolonged exposure to crystalline silica by inhalation may cause silicosis, a fibrosis (scarring) of the lungs which can be progressive and may lead to death

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.

Individual Components

Lead Monoxide: 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.

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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 (CLP Annex VI 3.2) and Repr. 1A (CLP Annex VI 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.

Sodium Tetraborate: An adult lethal dose is greater than 15 to 20g (5-10g for children). Oral LD50 (rat):2400-2600 mg/kg. Dermal LD50 (Rabbit): >2000 mg/kg. Ingestion of large doses may cause gastrointestinal irritation, kidney injury and may result in death from CNS depression. Classified as a reproductive and developmental toxin (Repr. Cat. 2).

Silica: Inhalation LCLo (human): 300 ug/m^3/10Y-I. Carcinogenicity: Crystalline silica (quartz) inhaled from occupational sources is classified by the International Agency for Research on Cancer (IARC) as class I: carcinogenic to humans. ACGIH (2006): A2 (suspected human carcinogen); MAK: Carcinogen category: I.

Sodium Carbonate: Oral rat LD50: 4090 mg/kg; inhalation rat LC50: 2300 mg/m^3/2H; irritation eye rabbit: 50 mg severe; investigated as a mutagen, reproductive effector. Sodium carbonate is not a suspected carcinogen.

Silver Nitrate (7761-88-8): Oral rat LD50: 1173 mg/kg. 50 mg/kg (orl-mus). Irritation data, rabbit, std Draize: eye= 1 mg, severe. Investigated as a tumorigen, mutagen, and reproductive effector. Not an NTP or IARC carcinogen.

SECTION 12. Ecological Information

No data for the product. Information is provided for the components.

Persistence/ degradation: The solubility of lead monoxide in cold water is 70 mg/L. Soil mobility is expected to be low. Boron is naturally occurring and ubiquitous in the environment. Sodium tetraborate anhydrous decomposes in the environment to natural borate and has high soil mobility.

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. Borates are essential micronutrients but may be harmful at high concentrations.

Aquatic toxicity: Bioaccumulation/bioconcentration factors for lead in freshwater: 1,553 L/kg (wet weight); and in soil: 0.39 kg/kg (dry weight). Sodium Tetraborate may be harmful to aquatic life at high concentrations.

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 (REACH Chemical Safety Report, 2010)

SECTION 13. Disposal Considerations

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 EU, national and local requirements. Empty bags should stacked and packed into sealed drums for disposal. Consider recycling this product to lead manufacturers.

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SECTION 14. Transport Information

Land transport (ADR/RID): UN-No.: 2291. Proper shipping name: Lead Compound, Soluble, N.O.S. (Lead Monoxide). Class: 6.1. Classification Code: T5. Packing group: III. Special provision(s): 199. Hazard Label:

Hazchem Code: 2Z

Sea transport (IMDG Code): UN-No.: 2291. Proper shipping name: Lead Compound, Soluble, N.O.S. (Lead Monoxide). Class: 6.1. Packing group: III. Marine Pollutant: yes. Special provision(s): 199. EMS: F-A, S-A. Storage: Category A. Hazard Labels:

International Air Transport (ICAO): UN No: 2291. Shipping name: Lead Compound, Soluble, N.O.S. (Lead Monoxide); Class 6.1; Packing Group III. Special provision(s): 199. Hazard Label:

SECTION 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)

Sodium Tetraborate: Listed on EINECS and U.S. EPA TSCA Inventory; Canadian DSL; South Korea; Japanese MITI (1)-69; Australia (AICS).

Sodium carbonate: listed by EINECS and China, Korea, Japan, Philippines Silica: Australia (AICS), US (TSCA), EU (EINECS), Canada (DSL).

Silica, quartz: listed in Australia (AICS), US (TSCA), EU (EINECS), Canada (DSL)

SECTION 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.

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