

# Material Safety Data Sheet

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

**Product name:** MAGELLAN LEAD CONCENTRATE

**Synonyms:** LEAD CONCENTRATE.

**CAS-No.:** Not applicable.

**Supplier:** MAGELLAN METAL PTY LTD

**ACN:** 68 075 523 661

**Address:** 96 Welshpool Rd, Welshpool, 6106, Western Australia

**Telephone:** (08) 9267 7000 (Perth Office)

**Emergency telephone number:** (08) 9981 2144 (Magellan Mine)

## 2. HAZARDS IDENTIFICATION

HAZARDOUS according to NOHSC criteria.

Classified as a DANGEROUS GOOD, according to the Australian Dangerous Goods Code (ADG Code) for transport by road or rail.

**Poisons Schedule:** Classified as a Schedule 6 Poison by the criteria for the Uniform Scheduling of Drugs and Poisons (SUSDP).

### Risk and Safety Phrases -

Risk and safety phrases are standard phrases used for the classification and labelling of hazardous substances. Risk phrases convey a general description of the physicochemical, environmental and health hazards of a substance. Safety phrases provide information on safe storage, handling, disposal, personal protection and first aid.

#### RISK PHRASES

R20/22 Harmful by inhalation and if swallowed.

R33 Danger of cumulative effects.

R61 May cause harm to the unborn child.

R62 Possible risk of impaired fertility.

R49(Category 1) May cause cancer by inhalation.

R50/53 Very toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

#### SAFETY PHRASES

S13 Keep away from food, drink and animal foodstuffs.

S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S53 Avoid exposure – obtain special instructions before use.

S45 In case of accident or if you feel unwell, contact a doctor or Poisons Information Centre immediately (show the label where possible).

S60 This container and its contents must be disposed of as a hazardous waste.

S61 Avoid release to the environment. Refer to special instructions/ material safety data sheets.

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## 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Recommended use:** Industrial applications.

**Appearance:** Dark grey to light grey-brown soil-like solid. It is an amorphous solid ore consisting predominantly of lead mainly in the form of cerussite and anglesite (up to 15% lead content) as well as other silicates, minerals and trace metals found in soil/rock that are not readily separable into the individual components. The components of the ore have been identified and quantified by elemental analysis. The lead concentrate typically has 5-9% moisture content at time of shipping.

Component	CAS Number	Concentration % wt/wt
Lead (Pb) (mainly present as cerussite – lead carbonate but up to 15% may also be present as anglesite - lead sulphate). Other forms of lead minerals may be present at less than 0.05% including (Pyromorphite, plumbogummite and galena).	7439-92-1	60 - 70
Silica, Crystalline - Quartz (SiO <sub>2</sub> )	14808-60-7	3 - 10
Cadmium (Cd)	7440-43-9	<0.01
Nickel (Ni)	7440-02-0	0.0005 - 0.001
Sulphur (S)	7704-34-9	1 - 5
Iron (III) Oxide (Fe <sub>2</sub> O <sub>3</sub> )	1309-37-1	1 - 3
Trace Metals	Not Available	Remainder
		100%

## 4. FIRST AID MEASURES

**Ingestion:** Rinse mouth with water. Give plenty of water to drink. If poisoning occurs, contact a doctor or Poisons Information Centre. *Phone Australia 131126.*

**Eye contact:** Irrigate with copious quantities of water for 15 minutes. In all cases of eye contamination it is a sensible precaution to seek medical advice, especially if irritation persists.

**Skin contact:** If skin contact occurs, remove contaminated clothing and wash affected skin thoroughly. If irritation occurs seek medical advice.

**Inhalation:** Avoid inhaling dust. Remove exposed person to fresh air if adverse effects are observed. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical advice.

**Notes to physician:** Treat symptomatically.

## 5. FIRE-FIGHTING MEASURES

**Specific hazards:** Non combustible solid. Will evolve highly toxic lead oxide fume when heated to decomposition. Evacuate area and contact emergency services (000). Remain upwind and notify persons downwind of hazard.

### Extinguishing Media

Use waterfog, foam, carbon dioxide or dry agent to cool intact containers and nearby storage areas and/or fight fire. Prevent contamination of drains, sewers and waterways and absorb runoff with sand (or similar).

**Fire fighting further advice:** Non-combustible solid. Fire fighters should wear AS/NZS approved, positive pressure, self-contained breathing apparatus and full protective clothing when appropriate.

**Product name:** Magellan Lead Concentrate

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Hazchem Code: 2Z

## 6. ACCIDENTAL RELEASE MEASURES

For large spills contact emergency services and supplier. Clear area of unprotected personnel; wear PVC/rubber gloves, dust proof goggles, a particulate respirator, coveralls and boots when cleaning spills. Collect and place into sealable containers for treatment and/or disposal. Avoid generating dust. Do not allow contamination to drains, sewers or waterways.

## 7. HANDLING AND STORAGE

**Handling:** Carefully read the product label prior to use. Safe work practices should be employed to avoid eye or skin contact and inhalation. Observe good personal hygiene, including thoroughly washing hands before eating. All eating, drinking and smoking should be prohibited in work areas.

**Storage:** Avoid generating dust. Store in a cool, dry, well ventilated area, and away from oxidising agents, acids and foodstuffs. Ensure product is adequately labelled.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### National Occupational Exposure Limits:

No value assigned for this specific material by the National Occupational Health and Safety Commission (NOHSC).

However, Exposure Standards for elemental components are as follows (1):

Lead (Pb) (7439-92-1)

TWA: 0.15 mg/m<sup>3</sup> (inorganic lead dusts and fumes)

Biological monitoring of blood lead is required:

Females of reproductive capacity: 10 µg/dL

Males and females not of reproductive capacity: 30 µg/dL.

Refer to National Standard for the Control of Inorganic Lead at Work [NOHSC:1012(1994)] (2) for further details on monitoring frequency and other requirements.

[http://www.ascc.gov.au/NR/rdonlyres/31042763-B7ED-4F51-B95D-191E3CA7D378/0/leadstandard\\_NOHSC1012\\_1994.pdf](http://www.ascc.gov.au/NR/rdonlyres/31042763-B7ED-4F51-B95D-191E3CA7D378/0/leadstandard_NOHSC1012_1994.pdf) .

ACGIH Threshold limit value (TLV) (3)

TWA: 0.05 mg/m<sup>3</sup> (and inorganic compounds as Pb)

BEI : 30 µg/dl.

Silica, Crystalline - Quartz (SiO<sub>2</sub>) (14808-60-7)

TWA: 0.1 mg/m<sup>3</sup>

ACGIH Threshold Limit Value (TLV) (3)

TWA: 0.025 mg/m<sup>3</sup> (as α-Quartz, measured as respirable fraction of the aerosol)

Cadmium (Cd) (7440-43-9)

TWA: 0.01 mg/m<sup>3</sup> (cadmium and cadmium compounds)

Nickel (Ni) (7440-02-0)

TWA: 1 mg/m<sup>3</sup> (metal nickel)

TWA: 0.1 mg/m<sup>3</sup> (soluble nickel compounds)

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TWA - the Time-Weighted Average (TWA) airborne concentration over an eight-hour working day, for a five-day working week over an entire working life. According to current knowledge this concentration should neither impair the health of, nor cause undue discomfort to, nearly all workers.

STEL - Short Term Exposure Limits (STELs) are averaged over a period of 15 minutes and provide guidelines for the control of short-term exposure. STELs are important supplements to the eight-hour TWA exposure standards. STELs are generally established to minimise the risk in nearly all workers of the occurrence of: intolerable irritation, chronic or irreversible tissue change, and narcosis to an extent that could precipitate industrial accidents, provided the TWA exposure standards are not exceeded.

BEI – Biological exposure indices (BEI) are guidance values for assessing biological monitoring results. BEIs generally represent the level of determinants that are most likely to be observed in specimens collected from healthy workers who have been exposed to chemicals to the same extent as workers with inhalation exposure at the Threshold Limit Value (TLV). The BEI generally indicates a concentration below which nearly all workers should not experience adverse health effects.

The Occupational Exposure Standards (OES) are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These Exposure Standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

**Engineering measures:** Ensure ventilation is adequate and that air concentrations of components are controlled below quoted Exposure Standards. Keep containers closed when not in use.

**Personal Protection Equipment:** The selection of PPE is dependant on a detailed site specific risk assessment. The risk assessment should consider the work situation, the physical form of the chemical, the handling methods, and environmental factors.

Wear overalls, safety glasses and impervious gloves. Use with adequate ventilation. If inhalation risk exists wear particulate respirator (P3 filter respirator for toxic particles) meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use. Do not take working clothes home.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Form / Colour / Odour:** Dark grey to light grey-brown soil-like solid. Odourless.

Specific Gravity (t/m <sup>3</sup> )	: 5.6	Bulk Density (t/m <sup>3</sup> )	: 2.7-2.9
Vapour Density	: N App	Boiling Point	: N App
Vapour Pressure	: N App	Melting Point	: N Av
Flash Point	: N App	Decomp. Temp (°C)	: 315 (approx)
Flammability Limits	: Non Flammable	Sublimation Point	: N App
Autoignition Temp	: N Av	pH	: 7.5 - 8.5
% Volatile by volume	: N App	Viscosity	: N App
Solubility in water	: >50% <sup>a</sup>	Evaporation Rate	: N App

(Typical values only - consult specification sheet)

N Av = Not Available

N App = Not Applicable

<sup>a</sup> Solubility, as determined (4) according to ISO 3711 (1990) by acid digest, EDTA titration, is >50% (52.3 - 53.2%).

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## 10. STABILITY AND REACTIVITY

### Stability

Stable under normal conditions of use, storage, and transportation as shipped.

### Conditions to Avoid

Incompatible with oxidising agents (e.g. peroxides) and strong acids (e.g. hydrochloric acid). Reacts violently with fluorine, causing fire hazard.

### Hazardous Decomposition

Will evolve highly toxic lead oxide fume when heated to decomposition (315 °C).

### Hazardous Polymerization

Will not occur.

## 11. TOXICOLOGICAL INFORMATION

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet.

No toxicity information available for the product.

### Health Effects of Ingredients

#### A: Lead Carbonate

The half-life of lead in blood is estimated to be 20–40 days. Lead is excreted mainly in urine, very slowly. As a result, chronic exposure leads to the accumulation of lead in the body (6).

Oral administration to humans at 214 mg kg<sup>-1</sup> (total dose) for 4 weeks induced jaundice and gastrointestinal changes (5).

#### B: Inorganic Lead

The main target for lead toxicity is the nervous system, both in adults and children. Long-term exposure of adults can result in decreased performance in some tests designed to measure nervous system function (blood lead concentration of greater than 30 µg/dl (6). Exposure also causes small increases in blood pressure due to effects on the kidney (blood lead concentrations greater than 40 µg/dl), particularly in middle-aged and older people and can cause anaemia (clinical symptoms at blood lead levels of at least 80-100 µg/dl) (6). The most sensitive effects in young children and unborn children exposed to lead through their mothers includes decreased mental ability and learning difficulties (6,7,8). A clear exposure threshold for these effects has not been established however the effects are most consistently observed at concentrations greater than 10 µg/dl (6,7,8).

The International Agency for Research on Cancer (IARC) evaluation of lead concluded that lead is possible carcinogenic to humans (Group 2B). The evidence for the carcinogenicity of lead in humans was found to be inconclusive because of the limited number of studies, the small cohort sizes, and the failure to take adequate account of potential confounding variables. The IARC conclusion was based on carcinogenicity studies in rodents conducted with lead salts (lead arsenate and lead phosphate). At relatively high doses (in excess of 10mg/kg) renal toxicity and increases in renal tumours were observed (6,9).

#### B: Quartz – Crystalline silica

To date, there are no known adverse health effects associated with non-occupational exposure to quartz dust (10). Silicosis is indisputably causally related to occupational quartz exposure, and the dose-response assessments of the adverse health effects of quartz are based on epidemiological studies of occupational cohorts with silicosis. Although a causal association with respiratory cancer has been made from epidemiological studies of workers occupationally exposed to quartz the doses required to cause respiratory cancer is unclear

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(10). The International Agency for Research on Cancer evaluation of crystalline silica concluded that it is a human carcinogen (Group 1) (9).

## 12. ECOLOGICAL INFORMATION

Avoid contaminating drains, sewers and waterways.

### Ecotoxicity

The toxicity of inorganic lead salts to aquatic organisms is strongly dependent on environmental conditions such as water hardness, pH and salinity, a fact that has not been adequately considered in most toxicity studies (8).

Lead is unlikely to affect aquatic plants at levels that might be found in the general environment (8).

Young stages of fish are more susceptible to lead than adults or eggs. Typical symptoms of lead toxicity include spinal deformity and blackening of the caudal region. The no observed effect concentrations for inorganic lead has been determined in laboratory tests for several species (fresh water as well as salt water) under different conditions, and range from 7-250 µg Pb/L (8).

### Environmental Fate

Lead can accumulate in organisms, in particular those feeding primarily on particulate matter. Lead does not biomagnify in the aquatic food chain, as the levels of lead, as well as the bioaccumulation factors, decrease as the trophic level rises (8).

## 13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with relevant local legislation. Contact manufacturer for additional information.

## 14. TRANSPORT INFORMATION

Classified as a Dangerous Good by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by road or rail.

UN Number: 2291

Class: 6.1

Correct Shipping Name: LEAD COMPOUND SOLUBLE N.O.S (contains 77-82% lead carbonate)

Packing Group: III

Hazchem Code: 2Z

International Maritime Dangerous Goods Code classification: Class 6.1, UN Number 2291, Lead compound soluble N.O.S. (contains 77-82% lead carbonate), packing group III.

Do not transport with chemicals of class: 1 (Explosives), 5.1 (Oxidising agents), 5.2 (Organic peroxides) and foodstuffs.

## 15. REGULATORY INFORMATION

Hazardous according to criteria of NOHSC.

Classified as a Class 6.1, Packing group III Dangerous Good by the criteria of the Australian Dangerous Goods Code (ADG Code) for transport by road or rail.

**Poisons Schedule:** Classified as a Schedule 6 Poison by the criteria for the Uniform Scheduling of Drugs and Poisons (SUSDP).

**AICS:** All chemical components listed on the Australian Inventory of Chemical Substances (AICS)

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## 16. OTHER INFORMATION

### Literary reference

- (1) NOHSC: Exposure Standards for Atmosphere Contaminants in the Occupational Environment. 1995.
- (2) National Standard for the Control of Inorganic Lead at Work [NOHSC:1012(1994)].
- (3) 2006 Guide to Occupational Exposure Values. Compiled by American Conference of Governmental Industrial Hygienists (ACGIH).
- (4) SGS Mineral Services (2007). Solubility study conducted to ISO 3711: 1990(E). Internal Standard ISO 3711, Second Edition 1990-12-15. Lead chromate pigments and lead chromate-molybdate pigments - Specifications and methods of test. SGS Australia Pty Ltd Report No WM100264.
- (5) DOSE (2004). Substance profile Lead carbonate. The Dictionary of Substances and Their Effects (DOSE, 3rd Electronic Edition) 2005 by The Royal Society of Chemistry/Knovel Corp.
- (6) WHO (2000). Safety Evaluation Of Certain Food Additives And Contaminants Who Food Additives Series: 44 Prepared by the Fifty-third meeting of the Joint FAO/WHO Expert Committee on Food Additives (JECFA) World Health Organization, Geneva, 2000 IPCS - International Programme on Chemical Safety
- (7) ATSDR (2005) Draft Toxicological Profile for Lead. U.S. Department of Health and Human Services Public Health Service Agency for Toxic Substances and Disease Registry.
- (8) UNEP (2006). Interim Review Of Scientific Information On Lead Version Of October 2006 United Nations Environment Programme Dtie/Chemicals  
[http://www.chem.unep.ch/Pb\\_and\\_Cd/SR/Files/Interim\\_reviews/UNEP\\_Lead\\_review\\_Interim-Oct2006.pdf](http://www.chem.unep.ch/Pb_and_Cd/SR/Files/Interim_reviews/UNEP_Lead_review_Interim-Oct2006.pdf)
- (9) IARC (1987). IARC Monographs on the Evaluation of Carcinogenic Risks to Humans Overall Evaluations of Carcinogenicity: An Updating of IARC Monographs Volumes 1 to 42. Supplement 7. World Health Organization. International Agency for Research on Cancer Lyon France.
- (10) WHO (2000). Concise International Chemical Assessment Document No. 24 Crystalline Silica, Quartz. World Health Organisation.

Contact Point: Registered Manager Magellan Mine  
Within Australia: Telephone (08) 9981 2144  
Facsimile (08) 9981 2164  
Emergency No. (08) 9981 2144

Reason for Issue: First Issue.

Safety Data Sheets are updated frequently. Please ensure that you have a current copy.

This Material Safety Data Sheet is maintained by Magellan Metal Pty Ltd in consultation with Toxikos Pty Ltd.

This MSDS summarises at the date of issue our best knowledge of the health and safety hazard information of the product, and in particular how to safely handle and use the product in the workplace. Since Magellan Metal cannot anticipate or control the conditions under which the product may be use, each user must, prior to usage, review this MSDS in the context of how the user intends to handle and use the product in the workplace.

If clarification or further information is needed to ensure that an appropriate assessment can be made, the user should contact Magellan Metal Pty Ltd.

Our responsibility for products sold is subject to our standard terms and conditions, a copy of which is sent to our customers and is also available upon request.