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1. PRODUCT IDENTIFICATION

Product Name	LEAD PLATE MATERIAL
Other Names	Lead Battery Plate Material, Unformed Plates DUC Plates, battery plates pre-pasted lead battery plates,
Use	Lead Acid Battery components and by-products.
Supplier Name and Address	Century Yuasa Batteries
	37-65 Cobalt St
	Carole Park
	QLD 4300
Telephone	(07) 3361 6161
Emergency (24 Hours)	(07) 3361 6707
Relevant identified uses	Lead Battery components, Recycling

2. HAZARD(S) IDENTIFICATION

DANGER

HAZARDOUS CHEMICAL DANGEROUS GOODS. According to the Model WHS Regulations and the ADG Code.

Poisons Schedule S6 Classified as S6:- Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)

Signal Word

GHS Classification

Acute Toxicity (Oral) Category 4, Acute Toxicity (Inhalation) Category 4, Reproductive Toxicity Category 1B, STOT - RE Category 2, Acute Aquatic Hazard Category 1, Chronic Aquatic Hazard Category 1









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	Harmful	Health Hazard E	Environment	
Hazard Statements	H302	Harmful if swallowed	H373	May cause damage to organs through prolonged or repeated exposure
	H332	Harmful if inhaled	H400	Very toxic to aquatic life
	H360	May damage fertility or the unbor child	n H410	Very toxic to aquatic life with long lasting effects
Precautionary Statements	Prevention		<u>Response</u>	
	P101	If medical advice is needed, have product container or label at have		IF EXPOSED: or concerned: Get medical advice / attention.
	P102	Keep out of reach of children	P314	Get medical advice / attention if you feel unwell.
	P103	Read label before use.	P301+P312	IF SWALLOWED: Call a POISON CENTER / doctor / physician / first aider / if you feel unwell.
	P201	Obtain special instructions before use.	e P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
	P260	Do not breathe dust / fume / gas / mist / vapours / spray.	/ P391	Collect spillage.
	P270	Do not eat, drink or smoke when using this product.	<u>Storage</u>	
	P271	Use only outdoors or in a well- ventilated area.	P405	Store locked up.
	P273	Avoid release to the environment	Disposal	
	P280	Wear protective gloves / protective clothing / eye protection / face protection	ve P501	Dispose of contents, container to authorised chemical landfill or if organic, the high temperature incineration

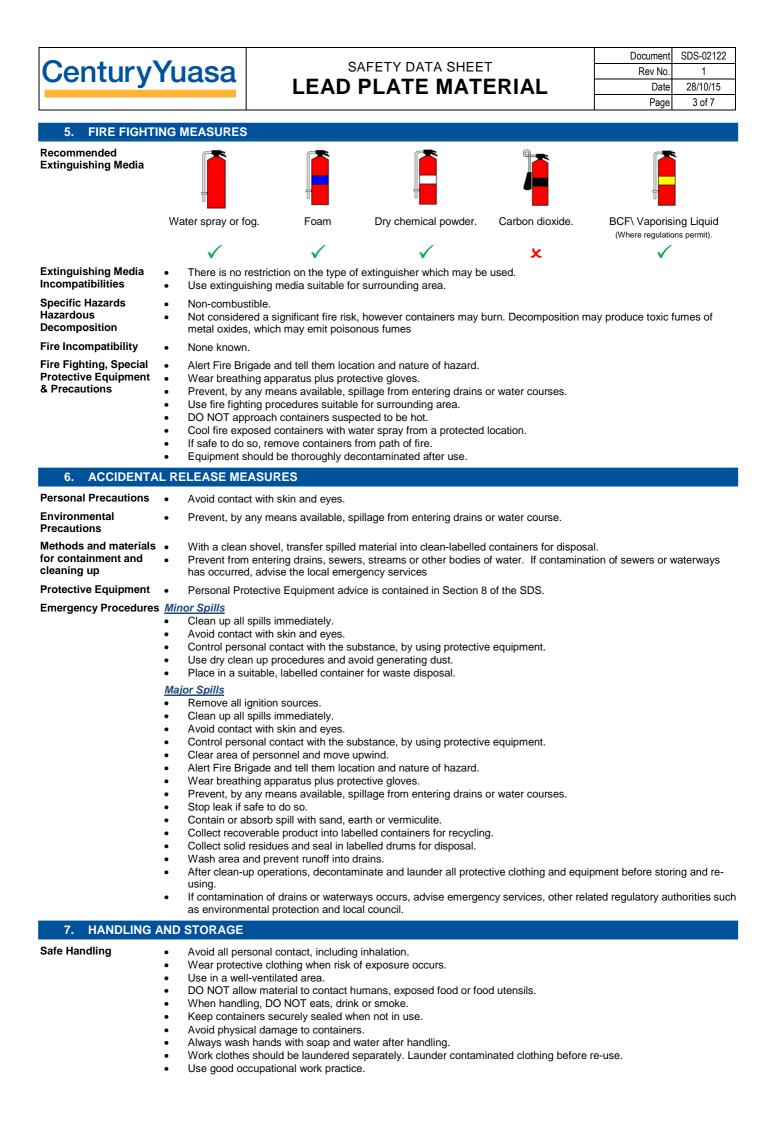


3. COMPOSITION, INFORMATION ON INGREDIENTS

Ingredient	Identification	Content % weight
Lead (Pb)	CAS 7439-92-1	30-40%
Lead Monoxide (PbO)	CAS 1317-36-8	30-50%
Lead Sulphate (PbSO ₄)	CAS 7446-14-2	60-70%

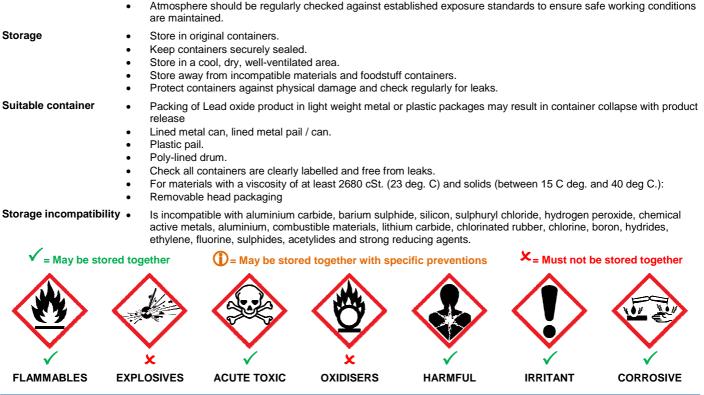
4. FIRST AID MEASURES

DESCRIPTION OF FIRS	T AID MEASURES
Eye contact	 If this product comes in contact with the eyes: Wash out immediately with fresh running water. Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. Seek medical attention without delay; if pain persists or recurs seek medical attention. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin contact	 If skin contact occurs: Immediately remove all contaminated clothing, including footwear. Flush skin and hair with running water (and soap if available). Seek medical attention in event of irritation.
Inhalation	 If fumes or combustion products are inhaled: Remove from contaminated area. Lay patient down. Keep warm and rested. Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. Transport to hospital, or doctor.
Ingestion	 IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY. For advice, contact a Poisons Information Centre or a doctor. Urgent hospital treatment is likely to be needed. In the meantime, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition. If the services of a medical officer or medical doctor are readily available, the patient should be placed in his / her care and a copy of the SDS should be provided. Further action will be the responsibility of the medical specialist. If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the SDS. Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise: INDUCE vomiting with fingers down the back of the throat, ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. NOTE: Wear a protective glove when inducing vomiting by mechanical means.
MEDICAL ATTENTION A	ND SPECIAL TREATMENT. Indication of any immediate medical attention and special treatment needed
Treat symptomatically.	 Gastric acids solubilise lead and its salts and lead absorption occurs in the small bowel. Particles of less than 1 um diameter are substantially absorbed by the alveoli following inhalation. Lead is distributed to the red blood cells and has a half-life of 35 days. It is subsequently redistributed to soft tissue & bone-stores or eliminated. The kidney accounts for 75% of daily lead loss; integumentary and alimentary losses account for the remainder. Neurasthenic symptoms are the most common symptoms of intoxication. Lead toxicity produces a classic motor neuropathy. Acute encephalopathy appears infrequently in adults. Diazepam is the best drug for seizures. Whole-blood lead is the best measure of recent exposure; free erythrocyte protoporphyrin (FEP) provides the best screening for chronic exposure. Obvious clinical symptoms occur in adults when whole-blood lead exceeds 80 ug / dL. British anti-lewisite is an effective antidote and enhances faecal and urinary excretion of lead. The onset of action of BAL is about 30 minutes and most of the chelated metal complex is excreted in 4-6 hours, primarily in the bile. Adverse reaction appears in up to 50% of patients given BAL in doses exceeding 5 mg / kg. CaNa2EDTA has also been used alone or in concert with BAL as an antidote. D-penicillamine is the usual oral agent for mobilisation of bone lead; its use in the treatment of lead poisoning remains investigational. 2,3-dimercapto-1-propanesulphonic acid (DMPS) and dimercaptosuccinic acid (DMSA) are water soluble analogues of BAL and their effectiveness is undergoing review. As a rule, stop BAL if lead decreases below 50 ug / dL; stop; CaNa2EDTA if blood lead decreases below 40 ug / dL or urinary lead drops below 2 mg / 24hrs.





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EXPOSURE CONTROLS, PERSONAL PROTECTION

AUSTRALIAN EXPOSURE STANDARDS (Occupational Exposure Limits)

Ingredient	Material name	TWA	STEL
Lead (Pb)	Lead, inorganic dusts & fumes (as Pb)	0.15 mg / m3	Not Available
Lead Monoxide (PbO)	Lead, inorganic dusts & fumes (as Pb)	0.15 mg / m3	Not Available
Lead Sulphate (PbSO ₄)	Lead, inorganic dusts & fumes (as Pb)	0.15 mg / m3	Not Available

APPROPRIATE ENGINEERING CONTROLS

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are:

- Process controls which involve changing the way a job activity or process is done to reduce the risk.
- Enclosure and / or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.

PERSONAL PROTECTION



Respirator Type

Where the concentration of gas / particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.

 Type E-P Filter of sufficient capacity. 				
Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator	
up to 10 x ES	P1 Air-line*	-	PAPR-P1 -	
up to 50 x ES	Air-line**	P2	PAPR-P2	
up to 100 x ES	-	P3	-	
		Air-line*	-	
100+ x ES	-	Air-line**	PAPR-P3	

100+ x ES Negative pressure demand

* Continuous flow Other Protection

- Eyewash unit.
- Barrier cream.
- Skin cleansing cream.



Eve Protection

Safety glasses with side shields Chemical goggles. Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants.

Glove Type

Wear chemical protective gloves, e.g. PVC

Clothing Overalls.

Foot wear

Wear safety footwear or safety gumboots e.g. Rubber



9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Pale yellow / bright yellow orange coloured, very dense, odourless powder. Does not mix with water but classed as "soluble" under the provisions of SP 199 of the UN Transport Code.		
Odour	Not Available	Vapour pressure (kPa)	1 mm Hg @ 973 °C
Odour threshold	Not Available	Vapour density (Air = 1)	Not Applicable
рН	Not Applicable	Relative density (Water = 1)	9.53-9.6
Melting point / freezing point (°C)	888 °C	Solubility in water (g,L)	Immiscible
Initial boiling point and boiling range (°C)	1472 °C	Partition coefficient: n-octanol / water	Not Available
Flash point	Not Applicable	Molecular weight (g / mol)	223.2 g / mol
Evaporation rate	Not Available	Decomposition temperature (°C)	>500-700 °C lead fumes given off
Flammability	Not Applicable	Viscosity	Not Available
Upper, lower flammability or explosive limits	Not Applicable		

10. STABILITY AND REACTIVITY

Reactivity	 See section 7 and this section under Chemical stability Lead oxide:- is a strong oxidiser Attacks some plastics, rubber and coatings
Possibility of hazardous reactions	 See section 5 & 7 Reacts explosively with 90% performic acid, rubidium acetylide Reacts violently with strong oxidisers, Reacts violently with aluminium, sodium, zirconium, titanium, boron or silicon, when heated forms impact sensitive explosive mixtures with dichloromethylsilane
Incompatible materials	 See section 7 Is incompatible with aluminium carbide, barium sulphide, silicon, sulphuryl chloride, hydrogen peroxide, chemical active metals, aluminium, combustible materials, lithium carbide, chlorinated rubber, chlorine, boron, hydrides, ethylene, fluorine, sulphides, acetylides and strong reducing agents.
Chemical stability	 Product is considered stable Hazardous polymerisation will not occur. Unstable in the presence of incompatible materials
Hazardous decomposition products	See section 5 Thermal decomposition may produce oxides of lead.

11. TOXICOLOGICAL INFORMATION ACUTE EFFECTS

No adverse health effects expected if the product is handled in accordance with this safety Data sheet and the product Label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:-

Inhaled	The material is not thought to produce either adverse health effects or irritation of the respiratory tract following inhalation (as classified by EC Directives using animal models). Nevertheless inhalation of dusts, or fumes, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress. Adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled. Inhalation of dusts, generated by the material, during the course of normal handling, may be harmful. If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.
Ingestion	Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
Skin contact	The material is not thought to be a skin irritant (as classified by EC Directives using animal models). Abrasive damage however, may result from prolonged exposures. Skin contact with the material may damage the health of the individual; systemic effects may result following absorption. Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream, through for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.
Eye	Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may cause transient discomfort characterised by tearing or conjuctival redness (as with windburn). Slight abrasive damage may also result.
Chronic effects	An inorganic compound such as Lead is a cumulative harmful poison when exposed in small amounts can raise the body's content to toxic levels. Prolonged or repeated exposure to lead toxicity effects the nervous system (memory loss, tiredness, headaches, fatigue, irritability, decreased libido, dizziness, depression, encephalopathy (brain damage caused by altered brain function and structure), behavioural effects, altered mood states, disturbances in hand-eye coordination, reaction times, visual motor performance, and mental performance, disturbances to vision, changes in hearing, muscle and joint weakness of the arms and legs, (foot-drop and wrist-drop), heart / blood vessels (reduced haemoglobin synthesis and production, reduced life span and function of red blood cells, anaemia, increased blood

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pressure), digestive system (loss of appetite, anorexia, with severe abdominal pain, diarrhoea, inflammation of the stomach walls (gastritis) and colic, cramps, nausea, vomiting, constipation, weight loss and decreased urination, deposition of blue lead-line on the gums), kidneys / urinary system (reversible / irreversible kidney damage) and endocrine system. Increased levels of lead result in increased brain damage, coma and death in extreme cases.

- Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.
- Ample evidence from experiments exists that there is a suspicion this material directly reduces fertility.
- Lead can cross the placenta, and cause miscarriage, stillbirths and birth defects. Exposure before birth can cause
 mental retardation, behavioural disorders and infant death.
- Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).

Ample evidence exists that developmental disorders are directly caused by human exposure to the material.

Lead can accumulate in the skeleton for a very long time.

Acute Toxicity	Skin Irritation / Corrosion	Serious Eye Damage / Irritation	Respiratory Or Skin Sensitisation	Mutagenicity	Carcinogenicity	Reproductivity	Stot - Single Exposure	Stot - Repeated Exposure	Aspiration Hazard
✓	1	1	1	1	•	 Image: A set of the set of the	•	~	1

 \checkmark = Data required to make classification available \checkmark = Data available but does not fill the criteria for classification

Image: Data Not Available to make classification **12. ECOLOGICAL INFORMATION** Toxicity DO NOT discharge into sewer or waterways. Very toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment. Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters. Wastes resulting from use of the product must be disposed of on site or at approved waste sites. For Lead: Environmental Fate: Lead is assessed as low hazard if it remains in its solid, massive, metallic form. Lead, in the form of alkyls, has been introduced to the environment primarily from leaded gasoline / petrol. These are converted to water-soluble lead compounds of high toxicity and availability to plants. Atmospheric Fate: Lead is primarily an atmospheric pollutant that enters soil and water as fallout, a process determined by the physical form involved and particle size. Lead, in the form of alkyls, has been introduced to the environment primarily from leaded gasoline / petrol. Lead is absorbed by mammals / humans via vapors, contaminated dust, and fumes. Terrestrial Fate: Soil - Lead alkyls easily leach from soil to contaminate water sources close to highways. Plants -Lead alkyls that have been converted to water soluble lead compounds have high toxicity / availability to plants. Aquatic Fate: Lead that has entered the aquatic system is expected to be found in sediments. Ecotoxicity: Soluble or insoluble lead may enter the environment and accumulate. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment Fish The following applies to lead compounds in Daphnia The following applies to lead compounds in general: fish: lethal from 1.4 mg / l up S. general: fish: lethal from 1.4 mg / l up S. gairdnerii: LC50: 0.14 mg / I / 96h L. idus gairdnerii: LC50: 0.14 mg / I / 96h L. idus LC50: LC50: 546 mg / I fish test LC50: 236 mg / I 546 mg / I fish test LC50: 236 mg / I (calc. as free (calc. as free lead). lead). The following applies to lead compounds in Bacteria The following applies to lead compounds in Algae general: algae: Sc. quadricauda toxic from general: algae: Sc. quadricauda toxic from 3.7 3.7 mg / I up M. aeruginosa 0.45 mg / I mg / I up M. aeruginosa 0.45 mg / I (calc. as free (calc. as free lead). lead). Other Organisms The following applies to lead compounds in general: protozoa: E. sulcatum toxic from 0.02 mg / I up U, parduczi toxic from 0.07 mg / I up (calc. as free lead). Degradability No Data available for all ingredients **Bio-accumulative** Lead Monoxide LOW (BCF = 43) Potential **Mobility in Soil** No Data available for all ingredients **Other Adverse Effects** No Data available for all ingredients **13. DISPOSAL CONSIDERATIONS** Safe Handling & pose in accordance with federal, state or local regulation

Disposal of • Containers may still present a chemical hazard / danger when empty.	
Disposal of • Containers may still present a chemical hazard / danger when empty. Contaminated Packaging • Return to supplier for reuse / recycling if possible.	
 Otherwise: If container cannot be cleaned sufficiently well to ensure that residuals do not remain or if the container used to store the same product, and then puncture containers, to prevent re-use, and bury at an author landfill. Where possible retain label warnings and SDS and observe all notices pertaining to the product. Legislation addressing waste disposal requirements may differ by country, state and / or territory. Each 	orised

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Environmental	 This mater intended u of a materi supplier of DO NOT a It may be r In all cases Where in c Recycle wi Consult St Bury reside Recycle cc Observe a 	As operating in their area. In some areas, certain wastes must be tracked. ial may be recycled if unused, or if it has not been contaminated so as to r se. Shelf life considerations should also be applied in making decisions of al may change in use, and recycling or reuse may not always be appropria the material should be consulted. Ilow wash water from cleaning or process equipment to enter drains. necessary to collect all wash water for treatment before disposal. Is disposal to sewer may be subject to local laws and regulations and these loubt contact the responsible authority. herever possible or consult manufacturer for recycling options. ate Land Waste Management Authority for disposal. ue in an authorised landfill. Intainers if possible, or dispose of in an authorised landfill. Il label safeguards until containers are cleaned and destroyed. accordance with federal, state or local regulations.	this type. Note thate. In most insta	nat properties nces the	
Regulations	Refer to se	ection 15			
14. TRANSPORT INFORMATION					
REGULATED FOR TRANSPORT OF DANGEROUS GOODS ADG					
UN Number	2291				

Proper Shipping Name	LEAD COMPOUND	, SOLUBLE, N.O.S.		\wedge
Transport Hazard Class	Class: 6.1	Sub risk: Not Applicable		$\langle \chi \nu \rangle$
Packing group	III			
Environmental Hazards	No relevant data			
Special Precautions	Special provisions Limited quantity	199, 274 5 kg	6	
Additional Information	Marine Pollutant: Ye	es		
Hazchem Code	2Z		~	•

15. REGULATORY INFORMATION

SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS, LEGISLATION

Lead (Pb);Lead Monoxide (PbO) and Lead Sulphate (PbSO4) are found on the following regulatory lists	Australia Exposure Standards", "Australia Inventory of Chemical Substances (AICS)","International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs", "International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft", "Australia Hazardous Substances Information System - Consolidated Lists"				
Poisons Schedule (Australia)	6	AICS Status	All the constituents of this product are listed		
APVMA Status	Not relevant	AQIS Status	Status not relevant		
TGA Status	Not relevant				
Work Appro Haza Mode Label	ADG Code - Australian Transport of Dangerous Goods Vorkplace Exposure Standard for Airborne Contaminants Approved Criteria for Classifying Hazardous Substances NOHSC: 1008 (2004) Hazardous Substances Information System (HSIS) Model Work Health and Safety Regulations 2011, Chapter 7 Hazardous Chemicals, Part 7.2 Lead. Labelling of Workplace Hazardous Chemicals- Code Of Practice Preparation of Safety Data Sheets for Hazardous Chemicals- Code of Practice				

16. OTHER RELEVANT INFORMATION

Revision Information	Revision No	Date	Description		
	1	28/10/15	Initial SDS creation		
Abbreviations AICS Australia Inventory of Chemical Substances			ventory of Chemical Substances		
	APVMA	MA Australian Pesticides and Veterinary Medicines Authority			
	AQIS	S Australian Quarantine and Inspection Service			
	CAS #	# Chemical Abstract Service Number – used to uniquely identify chemical compounds			
	IARC	ARC International Agency for Research on Cancer			
	LC50	 LC50 Lethal Concentration- toxicity of the surrounding medium that will kill half of the sample population of a specific animal in a specified period through exposure via inhalation (respiration) SDS Safety Data Sheet- (SDS), previously called a Material Safety Data Sheet (SDS), 			
	SDS				
	TGA	TGA Therapeutic Goods Administration			