EXIDE BATTERIES - WET FILLED WITH ACID

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
EXIDE BATTERIES - WET FILLED WITH ACID

SYNONYMS
"lead acid battery lead acid cell wet cell wet battery lead acid accumulator", "starting battery car battery motorcycle battery fork lift battery SLI battery", "traction battery lighting battery starting lighting and ignition battery"

PROPER SHIPPING NAME
BATTERIES, WET, FILLED WITH ACID, electric storage

PRODUCT USE
Power source for electric starter motors for motor vehicles.
CHARGING HAZARD: Completion of charging process includes evolution of highly flammable and explosive hydrogen gas which is readily detonated by electric spark. No smoking or naked lights. Do not attach/detach metal clips.
Chemical hazards relate to the contents of the battery.

SUPPLIER
Company: Marshall Power
Address:
Peachey Road
Elizabeth West
SA, 5113
Australia
Telephone: +61 8 8282 4333
Emergency Tel: 1800 039 008 (24 hrs)
Emergency Tel: +61 3 9573 3112
Fax: +61 8 8282 4377

Section 2 - HAZARDS IDENTIFICATION

STATEMENT OF HAZARDOUS NATURE
HAZARDOUS SUBSTANCE. DANGEROUS GOODS. According to the Criteria of NOHSC, and the ADG Code.

RISK

Risk Codes	Risk Phrases
R22	• Harmful if swallowed.
R23	• Toxic by inhalation.
R33	• Danger of cumulative effects.
R35	• Causes severe burns.
R41	• Risk of serious damage to eyes.
R48/20/21/22	• Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
R50/53	• Very toxic to aquatic organisms, may cause long- term adverse effects in the aquatic environment.
R61(1)	• May cause harm to the unborn child.
R62(3)	• Possible risk of impaired fertility.

continued...

SAFETY

Safety Codes	Safety Phrases
S01	• Keep locked up.
S24	• Avoid contact with skin.
S25	• Avoid contact with eyes.
S36	• Wear suitable protective clothing.
S38	• In case of insufficient ventilation, wear suitable respiratory equipment.
S37	• Wear suitable gloves.
S39	• Wear eye/face protection.
S51	• Use only in well ventilated areas.
S09	• Keep container in a well ventilated place.
S53	• Avoid exposure - obtain special instructions before use.
S29	• Do not empty into drains.
S401	• To clean the floor and all objects contaminated by this material, use water and detergent.
S35	• This material and its container must be disposed of in a safe way.
S13	• Keep away from food, drink and animal feeding stuffs.
S27	• Take off immediately all contaminated clothing.
S26	• In case of contact with eyes, rinse with plenty of water and contact Doctor or Poisons Information Centre.
S45	• In case of accident or if you feel unwell IMMEDIATELY contact Doctor or Poisons Information Centre (show label if possible).
S57	• Use appropriate container to avoid environmental contamination.
S61	• Avoid release to the environment. Refer to special instructions/Safety data sheets.
S60	• This material and its container must be disposed of as hazardous waste.
S63	• In case of accident by inhalation: remove casualty to fresh air and keep at rest.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
Sealed polypropylene container with contents typically,		
lead	7439-92-1	51.4
lead dioxide	1309-60-0	20.8
immersed in:		
sulfuric acid	7664-93-9	19-44
nonhazardous ingredients		8.2

Section 4 - FIRST AID MEASURES

SWALLOWED

- For advice, contact a Poisons Information Centre or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Transport to hospital or doctor without delay.

continued...

EYE

■ If this product comes in contact with the eyes:
- Immediately hold eyelids apart and flush the eye continuously with 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.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

SKIN

■ If skin or hair contact occurs:
- Immediately flush body and clothes with large amounts of water, using safety shower if available.
- Quickly remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.
- Transport to hospital, or doctor.

INHALED

- 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, without delay.
- Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.
- Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).
- As this reaction may be delayed up to 24 hours after exposure, affected individuals need complete rest (preferably in semi-recumbent posture) and must be kept under medical observation even if no symptoms are (yet) manifested.
- Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered.

This must definitely be left to a doctor or person authorised by him/her.
(ICSC13719).

NOTES TO PHYSICIAN

■ Treat symptomatically.
For acute or short term repeated exposures to strong acids:
- Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
- Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling
- Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
- Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues.

INGESTION:
- Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
- DO NOT attempt to neutralise the acid since exothermic reaction may extend the corrosive injury.
- Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
- Charcoal has no place in acid management.
- Some authors suggest the use of lavage within 1 hour of ingestion.

SKIN:
- Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
- Deep second-degree burns may benefit from topical silver sulfadiazine.

EYE:
- Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjuctival cul-de-

continued...

sacs. Irrigation should last at least 20-30 minutes. DO NOT use neutralising agents or any other additives. Several litres of saline are required.

- Cycloplegic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
- Steroid eye drops should only be administered with the approval of a consulting ophthalmologist).

[Ellenhorn and Barceloux: Medical Toxicology].

- 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-propanesulfonic 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.

[Ellenhorn & Barceloux: Medical Toxicology]

BIOLOGICAL EXPOSURE INDEX - BEI

These represent the determinants observed in specimens collected from a healthy worker who has been exposed at the Exposure Standard (ES or TLV):

Determinant	Index	Sampling Time	Comments
1. Lead in blood	30 ug/100 ml	Not Critical	
2. Lead in urine	150 ug/gm creatinine	Not Critical	B
3. Zinc protoporphyrin in blood	250 ug/100 ml erythrocytes OR 100 ug/100 ml blood	After 1 month exposure	B

B: Background levels occur in specimens collected from subjects NOT exposed.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.
- Do not approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

Slight hazard when exposed to heat, flame and oxidisers.

continued...

Section 5 - FIRE FIGHTING MEASURES

FIRE/EXPLOSION HAZARD

- Non combustible.
- Not considered to be a significant fire risk.
- Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- May emit corrosive, poisonous fumes. May emit acrid smoke.

Decomposition may produce toxic fumes of: sulfur oxides (SOx).

FIRE INCOMPATIBILITY

■ None known.

HAZCHEM

2R

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.
- Check regularly for spills and leaks.
- Clean up all spills immediately.
- Secure load if safe to do so.
- Bundle/collect recoverable product.
- Collect remaining material in containers with covers for disposal.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Neutralise/decontaminate residue (see Section 13 for specific agent).
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.
- Clean up all spills immediately.
- Wear protective clothing, safety glasses, dust mask, gloves.
- Secure load if safe to do so. Bundle/collect recoverable product.
- Use dry clean up procedures and avoid generating dust.
- Vacuum up (consider explosion-proof machines designed to be grounded during storage and use).
- Water may be used to prevent dusting.
- Collect remaining material in containers with covers for disposal.
- Flush spill area with water.
- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Neutralise/decontaminate residue (see Section 13 for specific agent).
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.

continued...

- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)
The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:
sulfuric acid 120 mg/m^3

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:
sulfuric acid 10 mg/m^3

other than mild, transient adverse effects without perceiving a clearly defined odour is:
sulfuric acid 2 mg/m^3*

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+)	>= 0.1%	Toxic (T)	>= 3.0%
R50	>= 0.25%	Corrosive (C)	>= 5.0%
R51	>= 2.5%		
else	>= 10%		

where percentage is percentage of ingredient found in the mixture

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING
- DO NOT allow clothing wet with material to stay in contact with skin.

SUITABLE CONTAINER
- DO NOT use aluminium or galvanised containers.
- Check regularly for spills and leaks.

For low viscosity materials
- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):
- Removable head packaging;
- Cans with friction closures and
- low pressure tubes and cartridges

may be used.
-
Where combination packages are used, and the inner packages are of glass, porcelain or stoneware, there must be sufficient inert cushioning material in contact with inner and outer packages unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.
No restriction on the type of containers. Packing as recommended by manufacturer. Check all material is clearly labelled.

STORAGE INCOMPATIBILITY
- Inorganic acids are generally soluble in water with the release of hydrogen ions. The resulting solutions have pH's of less than 7.0.
- Inorganic acids neutralise chemical bases (for example: amines and inorganic hydroxides) to form salts -

continued...

neutralisation can generate dangerously large amounts of heat in small spaces.

- The dissolution of inorganic acids in water or the dilution of their concentrated solutions with additional water may generate significant heat.
- The addition of water to inorganic acids often generates sufficient heat in the small region of mixing to cause some of the water to boil explosively. The resulting "bumping" can spatter the acid.
- Inorganic acids react with active metals, including such structural metals as aluminum and iron, to release hydrogen, a flammable gas.
- Inorganic acids can initiate the polymerisation of certain classes of organic compounds.
- Inorganic acids react with cyanide compounds to release gaseous hydrogen cyanide.
- Inorganic acids generate flammable and/or toxic gases in contact with dithiocarbamates, isocyanates, mercaptans, nitrides, nitriles, sulfides, and strong reducing agents. Additional gas-generating reactions occur with sulfites, nitrites, thiosulfates (to give H_2S and SO_3), dithionites (SO_2), and even carbonates.
- Acids often catalyse (increase the rate of) chemical reactions.
- Inorganic oxidising agents can react with reducing agents to generate heat and products that may be gaseous (causing pressurization of closed containers). The products may themselves be capable of further reactions (such as combustion in the air).
- Organic compounds in general have some reducing power and can in principle react with compounds in this class. Actual reactivity varies greatly with the identity of the organic compound.
- Inorganic oxidising agents can react violently with active metals, cyanides, esters, and thiocyanates.
- Inorganic reducing agents react with oxidizing agents to generate heat and products that may be flammable, combustible, or otherwise reactive. Their reactions with oxidizing agents may be violent.
- Incidents involving interaction of active oxidants and reducing agents, either by design or accident, are usually very energetic and examples of so-called redox reactions.
- Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.
- Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous.
- Avoid strong acids, acid chlorides, acid anhydrides and chloroformates.
- Avoid storage with reducing agents.

STORAGE REQUIREMENTS

- DO NOT store near acids, or oxidising agents.
- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storage and handling recommendations contained within this MSDS.

Store away from incompatible materials.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA mg/m³	STEL mg/m³
Australia Exposure Standards	Exide Batteries - Wet Filled With Acid (Lead, inorganic dusts & fumes (as Pb))	0.15	
Australia Exposure Standards	Exide Batteries - Wet Filled With Acid (Sulphuric acid)	1	3

EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m3)	Revised IDLH Value (ppm)
lead|21953	100	
lead dioxide|1872	100	

continued...

sulfuric acid|1830	15

MATERIAL DATA

EXIDE BATTERIES - WET FILLED WITH ACID:
LEAD DIOXIDE:
LEAD:

■ The lead concentration in air is to be maintained so that the lead concentration in workers' blood remains below 0.060 mg/100 g of whole blood. The recommended TLV-TWA has been derived following a review of reports of adverse effects on reproduction, blood-pressure and other end-points of toxicity. A particular focus was an assessment of pre-natal blood lead (PbB) levels and post-natal cognitive levels. The fact that lead is a cumulative toxicant which can produce subtle, persistent and apparently permanent effects in the off-spring of lead exposed women is of particular concern. A current view holds that the identification of the PbB levels, that are protective during a working lifetime, is a necessary prerequisite in the recommendation of the TLV because PbB values, rather than workplace air lead concentrations, are more clearly related to adverse health effects.

(see Biological Exposure Index - BEI - in "Advice to Doctor".).

EXIDE BATTERIES - WET FILLED WITH ACID:
SULFURIC ACID:

■ NOTE: Detector tubes for sulfuric acid, measuring in excess of 1 mg/m3, are commercially available.

Based on controlled inhalation studies the TLV-TWA is thought to be protective against the significant risk of pulmonary irritation and incorporates a margin of safety so as to prevent injury to the skin and teeth seen in battery workers acclimatised to workplace concentrations of 16 mg/m3. Experimental evidence in normal unacclimated humans indicates the recognition, by all subjects, of odour, taste or irritation at 3 mg/m3 or 5 mg/m3. All subjects reported these levels to be objectionable but to varying degrees.

SULFURIC ACID:

■ Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odour, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOEL); this is more closely allied to that of the USA.

OSHA (USA) concluded that exposure to sensory irritants can:

- cause inflammation
- cause increased susceptibility to other irritants and infectious agents
- lead to permanent injury or dysfunction
- permit greater absorption of hazardous substances and
- acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

PERSONAL PROTECTION

EYE

- Safety glasses with unperforated side shields may be used where continuous eye protection is desirable, as in laboratories; spectacles are not sufficient where complete eye protection is needed such as when handling bulk-quantities, where there is a danger of splashing, or if the material may be under pressure
- Chemical goggles.whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted
- Full face shield (20 cm, 8 in minimum) may be required for supplementary but never for primary protection

continued...

of eyes; these afford face protection.
- Alternatively a gas mask may replace splash goggles and face shields.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent].
- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent].

HANDS/FEET
- Elbow length PVC gloves.

Wear general protective gloves, eg. light weight rubber gloves.
- When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and
has to be observed when making a final choice.
Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:
- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).
- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

OTHER
- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

continued...

GLOVE SELECTION INDEX

■ Glove selection is based on a modified presentation of the:
" Forsberg Clothing Performance Index" .
The effect(s) of the following substance(s) are taken into account in the computer- generated selection: sulfuric acid

■ Protective Material CPI *.

NATURAL+NEOPRENE	A
NATURAL RUBBER	A
SARANEX- 23	A
NEOPRENE	A
NEOPRENE/NATURAL	A
PE	A
NITRILE	A
PVC	A

■ * CPI - Chemwatch Performance Index
A: Best Selection
B: Satisfactory; may degrade after 4 hours continuous immersion
C: Poor to Dangerous Choice for other than short term immersion
NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -
* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

RESPIRATOR

•Type E-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required. For further information consult site specific CHEMWATCH data (if available), or your Occupational Health and Safety Advisor.

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. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.
Employers may need to use multiple types of controls to prevent employee overexposure.

Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.
An approved self contained breathing apparatus (SCBA) may be required in some situations.
Provide adequate ventilation in warehouse or closed storage area.

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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Rectangular plastic casing with exposed terminals for electrical connections.
High weight to volume ratio.

PHYSICAL PROPERTIES

Corrosive.
Acid.

State	Manufactured	Molecular Weight	Not Applicable
Melting Range (℃)	Not Applicable	Viscosity	Not Applicable
Boiling Range (℃)	Not Applicable	Solubility in water (g/L)	Not Applicable
Flash Point (℃)	Not Applicable	pH (1% solution)	Not Applicable
Decomposition Temp (℃)	Not Available	pH (as supplied)	Not Applicable
Autoignition Temp (℃)	Not Applicable	Vapour Pressure (kPa)	Not Applicable
Upper Explosive Limit (%)	Not Applicable	Specific Gravity (water=1)	1.2- 1.3 (acid)
Lower Explosive Limit (%)	Not Applicable	Relative Vapour Density (air=1)	Not Applicable
Volatile Component (%vol)	Not Applicable	Evaporation Rate	Not Applicable

Section 10 - STABILITY AND REACTIVITY

CONDITIONS CONTRIBUTING TO INSTABILITY

- Contact with alkaline material liberates heat.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ 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.
Ingestion of acidic corrosives may produce burns around and in the mouth, the throat and oesophagus. Immediate pain and difficulties in swallowing and speaking may also be evident. Swelling of the epiglottis may make it difficult to breathe which may result in suffocation. More severe exposure may result in vomiting blood and thick mucus, shock, abnormally low blood pressure, fluctuating pulse, shallow respiration and clammy skin, inflammation of stomach wall, and rupture of oesophageal tissue. Untreated shock may eventually result in kidney failure. Severe cases may result in perforation of the stomach and abdominal cavity with consequent infection, rigidity and fever. There may be severe narrowing of the oesophageal or pyloric sphincters; this may occur immediately or after a delay of weeks to years. There may be coma and convulsions, followed by death due to infection of the abdominal cavity, kidneys or lungs.

EYE

■ If applied to the eyes, this material causes severe eye damage.
Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns. Mild burns of the epithelia generally recover rapidly and completely. Severe burns produce long-lasting and possibly irreversible damage. The appearance of the burn may not be apparent for several weeks after the initial contact. The cornea may ultimately become deeply opaque resulting in blindness.

continued...

SKIN

■ Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue.
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. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

■ Corrosive acids can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage. There may be dizziness, headache, nausea and weakness. Swelling of the lungs can occur, either immediately or after a delay; symptoms of this include chest tightness, shortness of breath, frothy phlegm and cyanosis. Lack of oxygen can cause death hours after onset.
Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may produce toxic effects; these may be fatal.
The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.
High concentrations cause inflamed airways and watery swellingof the lungs with oedema.

CHRONIC HEALTH EFFECTS

■ Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs.
Chronic exposure may inflame the skin or conjunctiva.
Substance accumulation, in the human body, is likely and may cause some concern following repeated or long-term occupational exposure.
Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects. This has been demonstrated via both short- and long-term experimentation.
Ample evidence exists that developmental disorders are directly caused by human exposure to the material.
Ample evidence from experiments exists that there is a suspicionthis material directly reduces fertility.
Lead, in large amounts, can affect the blood, nervous system, heart, glands, immune system and digestive system. Anaemia may occur. If untreated muscles may become paralysed, and there may be brain damage. Symptoms include joint and muscle pain, weakness in the back of the forearm and wrist and in the shin muscles, headaches, dizziness, abdominal pain, diarrhoea or constipation, nausea, vomiting, blue line on gums, sleep disturbance and a metallic taste in the mouth. The pressure in the brain may increase with high doses, and cause brain damage, coma, and death. Early signs include loss of appetite and weight, constipation, tiredness and irritability, headache, weakness. Later there may be vomiting, nervousness, and muscle pains in the arms and legs. Serious cases cause severe vomiting, inco-ordination, stupor, permanent eye damage, high blood pressure, multiple nerve disorders of the head resulting in paralysis and loss of reflexes, delirium, convulsions and coma. The kidneys may become irreversibly damaged, and the nervous system may become affected causing mental retardation, cerebral palsy, and jerks and seizures.
Lead can cross the placenta, and cause miscarriage, stillbirths and birth defects. Exposure before birth can cause mental retardation, behavioural disorders and infant death. Lead can also cause reduced sex drive, impotence, sterility and damage the sperm of males, increasing the potential for birth defects. Periods in women can also be affected.

TOXICITY AND IRRITATION

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

EXIDE BATTERIES - WET FILLED WITH ACID:
■ Not available. Refer to individual constituents.

LEAD:

TOXICITY	IRRITATION
Oral (woman) TDLo:450 mg/kg/6 years	Nil Reported

continued...

Inhalation (human) TCLo:0.01 mg/m³
WARNING:Lead is a cumulative poison and has the potential to cause abortion and intellectual impairment to unborn children of pregnant workers.

LEAD DIOXIDE:

TOXICITY	IRRITATION
Intraperitoneal (Mouse) LD50:291 mg/kg	
Intraperitoneal (Guinea pig) LD50:220 mg/kg	

SULFURIC ACID:

TOXICITY	IRRITATION
Oral (rat) LD50:2140 mg/kg	Eye (rabbit):1.38 mg SEVERE
Inhalation (rat) LC50:510 mg/m³/2h	Eye (rabbit):5 mg/30sec SEVERE
Inhalation (human) TCLo:3 mg/m³/24w	

■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.
WARNING: For inhalation exposure ONLY: This substance has been classified by the IARC as Group 1: CARCINOGENIC TO HUMANS.
Occupational exposures to strong inorganic acid mists of sulfuric acid:

CARCINOGEN

lead	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	2B	Possibly carcinogenic to humans
lead	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	2A	Probably carcinogenic to humans
lead	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	1	Carcinogenic to humans
lead dioxide	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	2A	Probably carcinogenic to humans

continued...

sulfuric acid	International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs	Group	1	Carcinogenic to humans

REPROTOXIN

lead	ILO Chemicals in the electronics industry that have toxic effects on reproduction	Reduced fertility or sterility	H A si

SKIN

sulfuric acid	GESAMP/EHS Composite List - GESAMP Hazard Profiles	D1: skin irritation/corrosion	3C

Section 12 - ECOLOGICAL INFORMATION

LEAD DIOXIDE:
SULFURIC ACID:
LEAD:
■ DO NOT discharge into sewer or waterways.

LEAD DIOXIDE:
LEAD:
■ 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.
■ For Metal:
Atmospheric Fate - Metal-containing inorganic substances generally have negligible vapour pressure and are not expected to partition to air.
Environmental Fate: Environmental processes, such as oxidation, the presence of acids or bases and microbiological processes, may transform insoluble metals to more soluble ionic forms. Environmental processes may enhance bioavailability and may also be important in changing solubilities.
Aquatic/Terrestrial Fate: When released to dry soil, most metals will exhibit limited mobility and remain in the upper layer; some will leach locally into ground water and/ or surface water ecosystems when soaked by rain or melt ice. A metal ion is considered infinitely persistent because it cannot degrade further. Once released to surface waters and moist soils their fate depends on solubility and dissociation in water. A significant proportion of dissolved/ sorbed metals will end up in sediments through the settling of suspended particles. The remaining metal ions can then be taken up by aquatic organisms. Ionic species may bind to dissolved ligands or sorb to solid particles in water.
Ecotoxicity: Even though many metals show few toxic effects at physiological pH levels, transformation may introduce new or magnified effects.
■ 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.

continued...

■ Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

LEAD:

Marine Pollutant	Yes
Hazardous Air Pollutant:	Yes

LEAD DIOXIDE:

Marine Pollutant	Yes

SULFURIC ACID:
■ Prevent, by any means available, spillage from entering drains or water courses.
For Sulfuric Acid:
Environmental Fate: Large discharges of sulfuric acid may contribute to the acidification of water and be fatal to aquatic life and soil micro-organisms, and may contribute to the acidification of effluent treatment systems and injure sewage treatment organisms. The substance will react violently with a variety of other chemicals, as well as water.
Atmospheric Fate: Sulfuric acid is removed from the air by dry/wet deposition. In the stratosphere, sulfuric acid aerosols have lifetimes of about 14 and 2.4 days, at altitudes of 15 and 20 km, respectively. At cloud level, the residence time is about 6 days, with shorter residence times in surface air. The substance will react with atmospheric water, (hygroscopic). The substance is a strong oxidizer, (reacts with oxygen), and is highly corrosive to stainless steel.
Terrestrial Fate: Soil - In soil, the ions from sulfuric acid can adsorb to soil particles or leach into surface water and groundwater. The ions, (sulfate, hydrogen), can adsorb to soil particles or be converted to gases. Low oxygen bacteria in sediments and soil can reduce sulfate to sulfur and hydrogen sulfide. Plants - Sulfates can be taken up by plants and be incorporated into the parenchyma of the plant.
Aquatic Fate: In water, sulfuric acid breaks apart into less complex groups of atoms, (dissociates), and the negatively charges sulfate atoms may combine with other positively charges atoms. Sulfuric acid will react violently in alcohol and water, especially if water is added to the product.
Ecotoxicity: Short term degradation products are not likely. However, long term degradation products may arise. The products of degradation are less toxic than the product itself. Sulfuric acid is moderately toxic to bluegill/sunfish, Aesop shrimp, and western mosquitofish.
Sulfuric acid is soluble in water and remains indefinitely in the environment as sulfate.
Large discharges may contribute to the acidification of water and be fatal to aquatic life and soil micro-organisms.
Large discharges may contribute to the acidification of effluent treatment systems and injure sewage treatment organisms. [ICI UK]

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
lead	No Data Available	No Data Available	LOW	No Data Available
lead dioxide	No Data Available	No Data Available	No Data Available	No Data Available
sulfuric acid	No Data Available	No Data Available	LOW	No Data Available

Section 13 - DISPOSAL CONSIDERATIONS

- Containers may still present a chemical hazard/ danger when empty.
- Return to supplier for reuse/ recycling if possible.

Otherwise:

- If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.
- Where possible retain label warnings and MSDS and observe all notices pertaining to the product.

continued...

- DO NOT allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.
- Recycle wherever possible.
- Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
- Treat and neutralise at an approved treatment plant. Treatment should involve: Mixing or slurrying in water; Neutralisation followed by: burial in a land-fill specifically licenced to accept chemical and / or pharmaceutical wastes or Incineration in a licenced apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

Section 14 - TRANSPORTATION INFORMATION

Labels Required: CORROSIVE

HAZCHEM:
2R (ADG7)

ADG7:

Class or Division:	8	Subsidiary Risk:	None
UN No.:	2794	Packing Group:	None
Special Provision:	295	Limited Quantity:	1 L
Portable Tanks & Bulk Containers - Instruction:	None	Portable Tanks & Bulk Containers - Special Provision:	None
Packagings & IBCs - Packing Instruction:	P801	Packagings & IBCs - Special Packing Provision:	None

Name and Description: BATTERIES, WET, FILLED WITH ACID, electric storage

Air Transport IATA:

ICAO/IATA Class:	8	ICAO/IATA Subrisk:	None
UN/ID Number:	2794	Packing Group:	-
Special provisions:	A51		
Cargo Only Packing Instructions:	870	Maximum Qty/Pack:	No Limit
Passenger and Cargo Packing Instructions:	870	Passenger and Cargo Maximum Qty/Pack:	30 kg G
Passenger and Cargo Limited Quantity Packing Instructions:	Forbidden	Passenger and Cargo Limited Quantity Maximum Qty/Pack:	Forbidden

Shipping name:BATTERIES, WET, FILLED WITH ACID, electric storage

continued...

Maritime Transport IMDG:

IMDG Class:	8	IMDG Subrisk:	None
UN Number:	2794	Packing Group:	None
EMS Number:	F- A, S- B	Special provisions:	295
Limited Quantities:	1 L	Marine Pollutant:	Yes

Shipping name:BATTERIES, WET, FILLED WITH ACID, electric storage

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Section 15 - REGULATORY INFORMATION

Indications of Danger:

C	Corrosive
N	Dangerous for the environment
T	Toxic

POISONS SCHEDULE Excempt

REGULATIONS

Exide Batteries - Wet Filled With Acid (CAS:) is found on the following regulatory lists;

"Australia - Queensland Work Health and Safety Regulation - Restricted hazardous chemicals","Australia National Pollutant Inventory","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix I","Australia Work Health and Safety Regulations 2011 - Restricted hazardous chemicals", "United Nations Consolidated List of Products Whose Consumption and/or Sale Have Been Banned, Withdrawn, Severely Restricted or Not Approved by Governments"

Regulations for ingredients

lead (CAS: 7439-92-1) is found on the following regulatory lists;

"Australia - Australian Capital Territory - Environment Protection Regulation: Ambient environmental standards (AQUA/1 to 6 - inorganic chemicals)","Australia - Australian Capital Territory - Environment Protection Regulation: Ambient environmental standards (Domestic water supply - inorganic chemicals)","Australia - Australian Capital Territory - Environment Protection Regulation: Ambient environmental standards (IRRIG - inorganic chemicals)","Australia - Australian Capital Territory - Environment Protection Regulation: Ambient environmental standards (STOCK - inorganic chemicals)","Australia - Australian Capital Territory - Environment Protection Regulation: Pollutants entering waterways taken to cause environmental harm - Domestic water supply quality","Australia - Australian Capital Territory - Environment Protection Regulation: Pollutants entering waterways taken to cause environmental harm (Aquatic habitat)","Australia - Australian Capital Territory - Environment Protection Regulation: Pollutants entering waterways taken to cause environmental harm (IRRIG)","Australia - Australian Capital Territory - Environment Protection Regulation: Pollutants entering waterways taken to cause environmental harm (STOCK)","Australia - New South Wales Hazardous Substances Requiring Health Surveillance","Australia - Queensland Work Health and Safety Regulation - Lead requiring health monitoring", "Australia - Queensland Work Health and Safety Regulation - Restricted hazardous chemicals","Australia - Western Australia Hazardous Substances Prohibited for Specified Uses or Methods of Handling","Australia Australian Safety and Compensation Council (ASCC) Draft National Code of Practice for the Control of Workplace Hazardous Chemicals - Schedule 4 Hazardous chemicals Requiring Health Surveillance","Australia Criteria for the export and import of used electronic equipment - Hazardous constituents","Australia Drinking Water Guideline Values For Physical and Chemical Characteristics","Australia Exposure Standards", "Australia Hazardous Substances","Australia High Volume Industrial Chemical List (HVICL)","Australia Inventory of Chemical Substances (AICS)","Australia National Pollutant Inventory","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix I","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4","Australia Work Health and Safety Regulations 2011 - Lead requiring health monitoring","Australia Work Health and Safety Regulations 2011 - Restricted hazardous chemicals","FisherTransport Information","International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs","OECD List of High Production Volume (HPV) Chemicals","OSPAR National List of Candidates for Substitution – Norway", "OSPAR National List of Candidates for Substitution – United Kingdom","Sigma-AldrichTransport Information","United Nations Consolidated List of Products Whose Consumption and/or Sale Have Been Banned, Withdrawn, Severely Restricted or Not Approved by Governments","WHO Guidelines for Drinking-water Quality - Guideline values for chemicals that are of health significance in drinking-water"

lead dioxide (CAS: 1309-60-0) is found on the following regulatory lists;

"Australia - New South Wales Hazardous Substances Requiring Health Surveillance","Australia - Queensland Work Health and Safety Regulation - Lead requiring health monitoring","Australia - Queensland Work Health and Safety Regulation - Restricted hazardous chemicals","Australia Australian Safety and Compensation Council (ASCC) Draft National Code of Practice for the Control of Workplace Hazardous Chemicals - Schedule 4 Hazardous chemicals Requiring Health Surveillance", "Australia Exposure Standards","Australia Hazardous Substances","Australia Inventory of Chemical Substances (AICS)","Australia National Pollutant Inventory", "Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix C","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix E (Part 2)","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix F (Part 3)","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix I","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 5","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6","Australia Work Health and Safety Regulations 2011 - Lead requiring health monitoring","Australia Work Health and Safety Regulations 2011 - Restricted hazardous chemicals","FisherTransport Information","International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs","OECD List of High Production Volume (HPV) Chemicals","Sigma-AldrichTransport Information","United Nations Consolidated List of Products Whose Consumption and/or Sale Have Been Banned, Withdrawn, Severely Restricted or Not Approved by Governments"

Sulphuric Acid 98 – 100 % (CAS: 7664-93-9) is found on the following regulatory lists;

"Australia Council of Australian Governments (COAG) Chemicals of Security Concern","Australia Customs (Prohibited Exports) Regulations 1958 - Schedule 9 Precursor substances - Part 2","Australia Exposure Standards","Australia Hazardous Substances","Australia High Volume Industrial Chemical List (HVICL)", "Australia Illicit Drug Reagents/Essential Chemicals - Category III","Australia Inventory of Chemical Substances (AICS)","Australia National Pollutant Inventory","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix E (Part 2)","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Appendix F (Part 3)","Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 6","FisherTransport Information","GESAMP/EHS Composite List - GESAMP Hazard Profiles","IMO IBC Code Chapter 17: Summary of minimum requirements","IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk","International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs","International Air Transport Association (IATA) Dangerous Goods Regulations","International Air Transport Association (IATA) Dangerous Goods

continued...

Regulations - Prohibited List Passenger and Cargo Aircraft","International Council of Chemical Associations (ICCA) - High Production Volume List", "International Numbering System for Food Additives","OECD List of High Production Volume (HPV) Chemicals","OSPAR National List of Candidates for Substitution – United Kingdom","Sigma-AldrichTransport Information","United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances - Table II","United Nations List of Precursors and Chemicals Frequently used in the Illicit Manufacture of Narcotic Drugs and Psychotropic Substances Under International Control (Red List) - Table II"

Section 16 - OTHER INFORMATION

REPRODUCTIVE HEALTH GUIDELINES

Ingredient	ORG	UF	Endpoint	CR	Adeq TLV
lead	0.01 mg/m3	1000	D	NA	-

■ These exposure guidelines have been derived from a screening level of risk assessment and should not be construed as unequivocally safe limits. ORGS represent an 8-hour time-weighted average unless specified otherwise.
CR = Cancer Risk/10000; UF = Uncertainty factor:
TLV believed to be adequate to protect reproductive health:
LOD: Limit of detection
Toxic endpoints have also been identified as:
D = Developmental; R = Reproductive; TC = Transplacental carcinogen
Jankovic J., Drake F.: A Screening Method for Occupational Reproductive
American Industrial Hygiene Association Journal 57: 641-649 (1996).

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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This is the end of the MSDS.