# Valve Regulated Battery Sealed Lead-Acid Battery VRLA GEL
## Ramcar Australia & New Zealand

Chemwatch Hazard Alert Code: **4**

Chemwatch: **42-7400**
Version No: **10.1.12.9**
Safety Data Sheet according to WHS Regulations (Hazardous Chemicals) Amendment 2020 and ADG requirements

Issue Date: **06/01/2021**
Print Date: **06/08/2021**
L.GHS.AUS.EN

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

### Product Identifier

| | |
|---|---|
| **Product name** | Valve Regulated Battery Sealed Lead-Acid Battery VRLA GEL |
| **Chemical Name** | Not Applicable |
| **Synonyms** | Not Available |
| **Proper shipping name** | BATTERIES, WET, NON-SPILLABLE, electric storage |
| **Chemical formula** | Not Applicable |
| **Other means of identification** | Bosch, Centurion, Eaglefield Batteries, IBD, Independent Battery Distributors, Lion Batteries, Platinum Power |

### Relevant identified uses of the substance or mixture and uses advised against

| | |
|---|---|
| **Relevant identified uses** | Battery. NOTE: Battery presents no chemical hazards during the normal operation provided the recommendations for handling, storage, transport and usage are observed. If the battery is broken and the internal components exposed, health hazards exist which require careful attention. NOTE: The chemical hazards relate to the released contents. Undamaged sealed Lead-acid batteries normally present a low hazard, however damaged batteries may release highly corrosive and toxic contents. Disassembly, abuse or destruction of battery cell may cause violent explosion with scattering of contents. Heating may cause bursting with release of contents. |

### Details of the supplier of the safety data sheet

| | |
|---|---|
| **Registered company name** | **Ramcar Australia & New Zealand** |
| **Address** | Unit A, 1 Reconciliation Rise Pemulwuy NSW 2145 Australia |
| **Telephone** | +61 2 9840 2800 |
| **Fax** | Not Available |
| **Website** | www.independentbatterydistributors.com.au; www.lionbatteries.com.au |
| **Email** | whsercw@ramcar.com.au |

### Emergency telephone number

| | |
|---|---|
| **Association / Organisation** | **CHEMWATCH EMERGENCY RESPONSE** |
| **Emergency telephone numbers** | +61 2 9186 1132 |
| **Other emergency telephone numbers** | +61 1800 951 288 |

**Once connected and if the message is not in your prefered language then please dial 01**

## SECTION 2 Hazards identification

### Classification of the substance or mixture

| | |
|---|---|
| **Poisons Schedule** | Not Applicable |
| **Classification [1]** | Skin Corrosion/Irritation Category 1A, Serious Eye Damage/Eye Irritation Category 1, Acute Toxicity (Inhalation) Category 4, Lactation Effects, Chronic Aquatic Hazard Category 1, Acute Toxicity (Oral) Category 4 |
| ***Legend:*** | *1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI* |

### Label elements

| | |
|---|---|
| **Hazard pictogram(s)** |  |
| **Signal word** | **Danger** |

### Hazard statement(s)

| | |
|---|---|
| **H314** | Causes severe skin burns and eye damage. |
| **H332** | Harmful if inhaled. |
| **H362** | May cause harm to breast-fed children. |
| **H410** | Very toxic to aquatic life with long lasting effects. |
| **H302** | Harmful if swallowed. |

### Precautionary statement(s) Prevention

| | |
|---|---|
| **P201** | Obtain special instructions before use. |
| **P260** | Do not breathe dust/fume. |
| **P263** | Avoid contact during pregnancy and while nursing. |
| **P264** | Wash all exposed external body areas thoroughly after handling. |
| **P271** | Use only outdoors or in a well-ventilated area. |
| **P280** | Wear protective gloves, protective clothing, eye protection and face protection. |
| **P270** | Do not eat, drink or smoke when using this product. |
| **P273** | Avoid release to the environment. |

### Precautionary statement(s) Response

| | |
|---|---|
| **P301+P330+P331** | IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. |
| **P303+P361+P353** | IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. |
| **P305+P351+P338** | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| **P310** | Immediately call a POISON CENTER/doctor/physician/first aider. |
| **P363** | Wash contaminated clothing before reuse. |
| **P308+P313** | IF exposed or concerned: Get medical advice/ attention. |
| **P391** | Collect spillage. |
| **P301+P312** | IF SWALLOWED: Call a POISON CENTER/doctor/physician/first aider if you feel unwell. |
| **P304+P340** | IF INHALED: Remove person to fresh air and keep comfortable for breathing. |

### Precautionary statement(s) Storage

| | |
|---|---|
| **P405** | Store locked up. |

### Precautionary statement(s) Disposal

| | |
|---|---|
| **P501** | Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation. |

## SECTION 3 Composition / information on ingredients

### Substances

See section below for composition of Mixtures

### Mixtures

| CAS No | %[weight] | Name |
|---|---|---|
| Not Available | | Sealed container with electrochemical |
| Not Available | | contents typically, |
| 7439-92-1 | 50-80 | lead |
| 1309-60-0 | 15-40 | lead dioxide |
| Not Available | | electrolyte (hydrogel) |
| 7664-93-9 | 5-30 | sulfuric acid |
| Not Available | | case material as, |
| 9003-07-0 | <10 | polypropylene |
| 9003-56-9 | <10 | styrene/ butadiene/ acrylonitrile copolymer |
| Not Available | <5 | separator |
| 7440-31-5 | <2 | tin |
| 7440-70-2 | <1 | calcium |

| | |
|---|---|
| ***Legend:*** | *1. Classified by Chemwatch; 2. Classification drawn from HCIS; 3. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 4. Classification drawn from C&L; * EU IOELVs available* |

## SECTION 4 First aid measures

### Description of first aid measures

| | |
|---|---|
| **Eye Contact** | ‣ Generally not applicable. |
| **Skin Contact** | For thermal burns:<br>‣ Decontaminate area around burn.<br>‣ Consider the use of cold packs and topical antibiotics.<br>For first-degree burns (affecting top layer of skin)<br>‣ Hold burned skin under cool (not cold) running water or immerse in cool water until pain subsides.<br>‣ Use compresses if running water is not available.<br>‣ Cover with sterile non-adhesive bandage or clean cloth.<br>‣ Do NOT apply butter or ointments; this may cause infection.<br>‣ Give over-the counter pain relievers if pain increases or swelling, redness, fever occur.<br>For second-degree burns (affecting top two layers of skin)<br>‣ Cool the burn by immerse in cold running water for 10-15 minutes.<br>‣ Use compresses if running water is not available. |

**Continued...**

| | |
|---|---|
| | - Do NOT apply ice as this may lower body temperature and cause further damage.<br>- Do NOT break blisters or apply butter or ointments; this may cause infection.<br>- Protect burn by cover loosely with sterile, nonstick bandage and secure in place with gauze or tape.<br>To prevent shock: (unless the person has a head, neck, or leg injury, or it would cause discomfort):<br>- Lay the person flat.<br>- Elevate feet about 12 inches.<br>- Elevate burn area above heart level, if possible.<br>- Cover the person with coat or blanket.<br>- Seek medical assistance.<br>For third-degree burns<br>Seek immediate medical or emergency assistance.<br>In the mean time:<br>- Protect burn area cover loosely with sterile, nonstick bandage or, for large areas, a sheet or other material that will not leave lint in wound.<br>- Separate burned toes and fingers with dry, sterile dressings.<br>- Do not soak burn in water or apply ointments or butter; this may cause infection.<br>- To prevent shock see above.<br>- For an airway burn, do not place pillow under the person's head when the person is lying down. This can close the airway.<br>- Have a person with a facial burn sit up.<br>- Check pulse and breathing to monitor for shock until emergency help arrives.<br>- Generally not applicable. |
| **Inhalation** | - Generally not applicable. |
| **Ingestion** | - Generally not applicable. |

### Indication of any immediate medical attention and special treatment needed

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-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 Firefighting measures

### Extinguishing media

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

**Continued...**

### Special hazards arising from the substrate or mixture

| | |
|---|---|
| **Fire Incompatibility** | None known. |

### Advice for firefighters

| | |
|---|---|
| **Fire Fighting** | ‣ Alert Fire Brigade and tell them location and nature of hazard.<br>‣ Wear full body protective clothing with breathing apparatus.<br>‣ Prevent, by any means available, spillage from entering drains or water course.<br>‣ Use fire fighting procedures suitable for surrounding area.<br>‣ **Do not** approach containers suspected to be hot.<br>‣ Cool fire exposed containers with water spray from a protected location.<br>‣ If safe to do so, remove containers from path of fire.<br>‣ Equipment should be thoroughly decontaminated after use.<br>Slight hazard when exposed to heat, flame and oxidisers. |
| **Fire/Explosion Hazard** | ‣ Non combustible.<br>‣ Not considered to be a significant fire risk.<br>‣ Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.<br>‣ Heating may cause expansion or decomposition leading to violent rupture of containers.<br>‣ May emit corrosive, poisonous fumes. May emit acrid smoke.<br>Decomposition may produce toxic fumes of:<br>sulfur oxides (SOx)<br>metal oxides<br>Articles and manufactured articles may constitute a fire hazard where polymers form their outer layers or where combustible packaging remains in place.<br>Certain substances, found throughout their construction, may degrade or become volatile when heated to high temperatures. This may create a secondary hazard. |
| **HAZCHEM** | 2R |

## SECTION 6 Accidental release measures

### Personal precautions, protective equipment and emergency procedures

See section 8

### Environmental precautions

See section 12

### Methods and material for containment and cleaning up

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

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

## SECTION 7 Handling and storage

### Precautions for safe handling

| | |
|---|---|
| **Safe handling** | Polyalphaolefin (PAO) dimers require bonding and grounding to prevent static hazards which could cause a fire<br>‣ Electrostatic discharge may be generated during pumping - this may result in fire.<br>‣ Ensure electrical continuity by bonding and grounding (earthing) all equipment.<br>‣ Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (<=1 m/sec until fill pipe submerged to twice its diameter, then <= 7 m/sec).<br>‣ Avoid splash filling.<br>‣ Do NOT use compressed air for filling discharging or handling operations. |

**Continued...**

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

### Conditions for safe storage, including any incompatibilities

| | |
|---|---|
| **Suitable container** | Generally packaging as originally supplied with the article or manufactured item is sufficient to protect against physical hazards.<br>If repackaging is required ensure the article is intact and does not show signs of wear. As far as is practicably possible, reuse the original packaging or something providing a similar level of protection to both the article and the handler.<br>**DO NOT** use aluminium or galvanised containers<br>Check regularly for spills and leaks<br>For low viscosity materials<br>Drums and jerricans must be of the non-removable head type.<br>Where a can is to be used as an inner package, the can must have a screwed enclosure.<br>For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):<br>Removable head packaging;<br>Cans with friction closures and<br>low pressure tubes and cartridges<br>may be used.<br>-<br>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.<br>No restriction on the type of containers. Packing as recommended by manufacturer. Check all material is clearly labelled. |
| **Storage incompatibility** | Protect from accidental short-circuit.<br>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.<br>Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.<br>Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous<br>Avoid strong acids, acid chlorides, acid anhydrides and chloroformates.<br>Avoid storage with reducing agents. |

## SECTION 8 Exposure controls / personal protection

### Control parameters

**Occupational Exposure Limits (OEL)**

**INGREDIENT DATA**

| Source | Ingredient | Material name | TWA | STEL | Peak | Notes |
|---|---|---|---|---|---|---|
| Australia Exposure Standards | lead | Lead, inorganic dusts & fumes (as Pb) | 0.05 mg/m3 | Not Available | Not Available | Not Available |
| Australia Exposure Standards | lead dioxide | Lead, inorganic dusts & fumes (as Pb) | 0.05 mg/m3 | Not Available | Not Available | Not Available |
| Australia Exposure Standards | sulfuric acid | Sulphuric acid | 1 mg/m3 | 3 mg/m3 | Not Available | Not Available |
| Australia Exposure Standards | tin | Tin, metal | 2 mg/m3 | Not Available | Not Available | Not Available |

**Emergency Limits**

| Ingredient | TEEL-1 | TEEL-2 | TEEL-3 |
|---|---|---|---|
| lead | 0.15 mg/m3 | 120 mg/m3 | 700 mg/m3 |
| lead dioxide | 0.17 mg/m3 | 140 mg/m3 | 810 mg/m3 |
| sulfuric acid | Not Available | Not Available | Not Available |
| polypropylene | 5.2 mg/m3 | 58 mg/m3 | 350 mg/m3 |
| tin | 6 mg/m3 | 67 mg/m3 | 400 mg/m3 |

| Ingredient | Original IDLH | Revised IDLH |
|---|---|---|
| lead | Not Available | Not Available |
| lead dioxide | 100 mg/m3 | Not Available |
| sulfuric acid | 15 mg/m3 | Not Available |
| polypropylene | Not Available | Not Available |
| styrene/ butadiene/ acrylonitrile copolymer | Not Available | Not Available |
| tin | Not Available | Not Available |
| calcium | Not Available | Not Available |

**Occupational Exposure Banding**

| Ingredient | Occupational Exposure Band Rating | Occupational Exposure Band Limit |
|---|---|---|
| calcium | C | > 0.1 to ≤ milligrams per cubic meter of air (mg/m³) |
| ***Notes:*** | *Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.* | |

**MATERIAL DATA**

Continued...

## Exposure controls

**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. 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. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

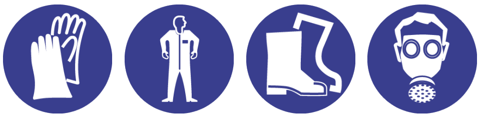
| Type of Contaminant: | Air Speed: |
|---|---|
| solvent, vapours, degreasing etc., evaporating from tank (in still air). | 0.25-0.5 m/s (50-100 f/min.) |
| aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation) | 0.5-1 m/s (100-200 f/min.) |
| direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion) | 1-2.5 m/s (200-500 f/min.) |
| grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion). | 2.5-10 m/s (500-2000 f/min.) |

Within each range the appropriate value depends on:

| Lower end of the range | Upper end of the range |
|---|---|
| 1: Room air currents minimal or favourable to capture | 1: Disturbing room air currents |
| 2: Contaminants of low toxicity or of nuisance value only. | 2: Contaminants of high toxicity |
| 3: Intermittent, low production. | 3: High production, heavy use |
| 4: Large hood or large air mass in motion | 4: Small hood-local control only |

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.
Articles or manufactured items, in their original condition, generally don't require engineering controls during handling or in normal use. Exceptions may arise following extensive use and subsequent wear, during recycling or disposal operations where substances, found in the article, may be released to the environment.

**Personal protection**



**Eye and face protection**

No special equipment required due to the physical form of the product.
- 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 lenses 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]

**Skin protection**

See Hand protection below

**Hands/feet protection**

- Elbow length PVC gloves

No special equipment required due to the physical form of the product.

**Body protection**

See Other protection below

**Other protection**

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

No special equipment required due to the physical form of the product.

### Recommended material(s)

**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:
Valve Regulated Battery Sealed Lead-Acid Battery VRLA GEL

| Material | CPI |
|---|---|
| NATURAL RUBBER | A |

### Respiratory protection

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

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required.
Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

| Required Minimum Protection Factor | Half-Face Respirator | Full-Face Respirator | Powered Air Respirator |
|---|---|---|---|

Continued...

| | |
|---|---|
| NATURAL+NEOPRENE | A |
| NEOPRENE | A |
| NEOPRENE/NATURAL | A |
| NITRILE | A |
| PE | A |
| PVC | A |
| SARANEX-23 | 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.

| | | | |
|---|---|---|---|
| up to 10 x ES | AE-AUS P2 | - | AE-PAPR-AUS / Class 1 P2 |
| up to 50 x ES | - | AE-AUS / Class 1 P2 | - |
| up to 100 x ES | - | AE-2 P2 | AE-PAPR-2 P2 ^ |

^ - Full-face
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

Respiratory protection not normally required due to the physical form of the product.

## SECTION 9 Physical and chemical properties

### Information on basic physical and chemical properties

| | |
|---|---|
| **Appearance** | Manufactured article; insoluble in water. |

| | | | |
|---|---|---|---|
| **Physical state** | Manufactured | **Relative density (Water = 1)** | 1.2185-1.3028 (electrolyte) |
| **Odour** | Not Available | **Partition coefficient n-octanol / water** | Not Available |
| **Odour threshold** | Not Available | **Auto-ignition temperature (°C)** | Not Applicable |
| **pH (as supplied)** | Not Applicable | **Decomposition temperature** | Not Available |
| **Melting point / freezing point (°C)** | Not Applicable | **Viscosity (cSt)** | Not Applicable |
| **Initial boiling point and boiling range (°C)** | 108-114 (electrolyte) | **Molecular weight (g/mol)** | Not Applicable |
| **Flash point (°C)** | Not Applicable | **Taste** | Not Available |
| **Evaporation rate** | <1 BuAC = 1 (electrolyte) | **Explosive properties** | Not Available |
| **Flammability** | Not Applicable | **Oxidising properties** | Not Available |
| **Upper Explosive Limit (%)** | 74.2 (H2 gas in air) | **Surface Tension (dyn/cm or mN/m)** | Not Applicable |
| **Lower Explosive Limit (%)** | 4.1 (H2 gas in air) | **Volatile Component (%vol)** | Not Applicable |
| **Vapour pressure (kPa)** | Not Applicable | **Gas group** | Not Available |
| **Solubility in water** | Immiscible | **pH as a solution (%)** | <1 (electrolyte) |
| **Vapour density (Air = 1)** | >1 (electrolyte) | **VOC g/L** | Not Applicable |

## SECTION 10 Stability and reactivity

| | |
|---|---|
| **Reactivity** | See section 7 |
| **Chemical stability** | · Unstable in the presence of incompatible materials<br>▸ Contact with alkaline material liberates heat |
| **Possibility of hazardous reactions** | See section 7 |
| **Conditions to avoid** | See section 7 |
| **Incompatible materials** | See section 7 |
| **Hazardous decomposition products** | See section 5 |

## SECTION 11 Toxicological information

### Information on toxicological effects

| | |
|---|---|
| **Inhaled** | Acidic corrosives produce respiratory tract irritation with coughing, choking and mucous membrane damage. Symptoms of exposure may include dizziness, headache, nausea and weakness. In more severe exposures, pulmonary oedema may be evident either immediately or after a latent period of 5-72 hours. Symptoms of pulmonary oedema include a tightness in the chest, dyspnoea, frothy sputum and cyanosis. Examination may reveal hypotension, a weak and rapid pulse and moist rates. Death, due to anoxia, may occur several hours after onset of the pulmonary oedema.<br>Considered an unlikely route of entry in commercial/industrial environments<br>Limited evidence or practical experience suggests that the material may produce irritation of the respiratory system, in a significant number of individuals, following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system. |

**Continued...**

| | |
|---|---|
| | Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful. |
| **Ingestion** | Considered an unlikely route of entry in commercial/industrial environments<br>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.<br>The material can produce severe chemical burns within the oral cavity and gastrointestinal tract following ingestion. |
| **Skin Contact** | Open cuts, abraded or irritated skin should not be exposed to this material<br>Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds 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.<br>Considered an unlikely route of entry in commercial/industrial environments<br>The material can produce severe chemical burns following direct contact with the skin. |
| **Eye** | When applied to the eye(s) of animals, the material produces severe ocular lesions which are present twenty-four hours or more after instillation.<br>Irritation of the eyes may produce a heavy secretion of tears (lachrymation).<br>Considered an unlikely route of entry in commercial/industrial environments<br>The material can produce severe chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating. |
| **Chronic** | Repeated or prolonged exposure to acids may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Gastrointestinal disturbances may also occur. Chronic exposures may result in dermatitis and/or conjunctivitis.<br>The impact of inhaled acidic agents on the respiratory tract depends upon a number of interrelated factors. These include physicochemical characteristics, e.g., gas versus aerosol; particle size (small particles can penetrate deeper into the lung); water solubility (more soluble agents are more likely to be removed in the nose and mouth). Given the general lack of information on the particle size of aerosols involved in occupational exposures to acids, it is difficult to identify their principal deposition site within the respiratory tract. Acid mists containing particles with a diameter of up to a few micrometers will be deposited in both the upper and lower airways. They are irritating to mucous epithelia, they cause dental erosion, and they produce acute effects in the lungs (symptoms and changes in pulmonary function). AsthmatIcs appear to be at particular risk for pulmonary effects.<br><br>On the basis, primarily, of animal experiments, concern has been expressed that the material may produce carcinogenic or mutagenic effects; in respect of the available information, however, there presently exists inadequate data for making a satisfactory assessment.<br>Toxic: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.<br>Serious damage (clear functional disturbance or morphological change which may have toxicological significance) is likely to be caused by repeated or prolonged exposure. As a rule the material produces, or contains a substance which produces severe lesions. Such damage may become apparent following direct application in subchronic (90 day) toxicity studies or following sub-acute (28 day) or chronic (two-year) toxicity tests.<br>There is sufficient evidence to establish a causal relationship between human exposure to the material and impaired fertility<br>There is sufficient evidence to establish a causal relationship between human exposure to the material and subsequent developmental toxic effects in the off-spring.<br><br>Excessive exposure to lead can affect the blood, the nervous system, heart, endocrine organs and the immune system and the digestive system. The synthesis of haemoglobin is inhibited and can result in anaemia. If left untreated, neuromuscular dysfunction, possible paralysis and encephalopathy (brain tissue damage) may result. Other symptoms of overexposure include joint and muscle pain, weakness of the extensor muscles (frequently the hand and wrist), headache, dizziness, abdominal pain, diarrhoea, constipation, nausea, vomiting, blue line on the gums, insomnia and metallic taste. High body levels produce cerebrospinal pressure, brain damage with stupor leading to coma and, in some cases, death. Early symptoms of lead poisoning ("plumbism") include anorexia and loss of weight, constipation, apathy or irritability, occasional vomiting, fatigue, headache, weakness, and a metallic taste in the mouth. Advanced poisonings are characterised by intermittent vomiting, irritability, nervousness, myalgia of the arms and legs (often with wrist and foot drop). Severe poisonings may produce persistent vomiting, ataxia, stupor or lethargy, visual disturbances progressing to optic neuritis and atrophy, hyper- tension, papilloedema, cranial nerve paralysis, delirium, convulsions and coma. Neurological effects include mental retardation, seizures, cerebral palsy and marked muscular contractions that distort the spine, limbs, hips and sometimes the cranial inervated muscles (dystonia musculorum deformans). Industrial exposure has been associated with irreversible kidney damage.<br>Lead is a cumulative poison with adverse effects in pregnancy [NIOSHTIC]<br>Lead salts have been reported to cross the placenta and induce embryo- and foeto-mortality. They also may have a teratogenic effect (causing birth deformities) in certain animal species. Organometallic lead may not produce these effects. Adverse effects of lead on human reproduction, embryonic and foetal development and postnatal mental development have also been recorded. Foetal exposure to lead may result in birth defects, mental retardation, behavioural disorders and death during the first year of childhood. Paternal effects may include reduced sex drive, impotence, sterility and adverse effects on the sperm which in turn may increase the potential for increased birth defects. Maternal effects may include miscarriage and stillbirth in exposed women, or women whose husbands might be exposed, sterility or decreased fertility, and abnormal menses. Exposure by both parents to lead may exacerbate the reproductive effects.<br>Repeated or long-term occupational exposure is likely to produce cumulative health effects involving organs or biochemical systems. |

| | TOXICITY | IRRITATION |
|---|---|---|
| **Valve Regulated Battery Sealed Lead-Acid Battery VRLA GEL** | Not Available | Not Available |
| **lead** | dermal (rat) LD50: >2000 mg/kg[1] | Not Available |
| | Inhalation(Rat) LC50; >5.05 mg/l4h[1] | |
| | Oral(Rat) LD50; >2000 mg/kg[1] | |
| **lead dioxide** | Oral(Rat) LD50; >2000 mg/kg[1] | Not Available |
| **sulfuric acid** | Inhalation(Mouse) LC50; 0.85 mg/l4h[1] | Eye (rabbit): 1.38 mg SEVERE |
| | Oral(Rat) LD50; >300 mg/kg[1] | Eye (rabbit): 5 mg/30sec SEVERE |
| **polypropylene** | Oral(Mouse) LD50; 3200 mg/kg[2] | Not Available |

**Continued...**

**styrene/ butadiene/ acrylonitrile copolymer**

| TOXICITY | IRRITATION |
|---|---|
| Dermal (rabbit) LD50: 5010 mg/kg[2] | Not Available |
| Oral(Rat) LD50; 5010 mg/kg[2] | |

**tin**

| TOXICITY | IRRITATION |
|---|---|
| dermal (rat) LD50: >2000 mg/kg[1] | Eye: no adverse effect observed (not irritating)[1] |
| Inhalation(Rat) LC50; >4.75 mg/l4h[1] | Skin: no adverse effect observed (not irritating)[1] |
| Oral(Rat) LD50; >2000 mg/kg[1] | |

**calcium**

| TOXICITY | IRRITATION |
|---|---|
| Dermal (rabbit) LD50: >2500 mg/kg[1] | Eye: no adverse effect observed (not irritating)[1] |
| Oral(Rat) LD50; >2000 mg/kg[1] | Skin: no adverse effect observed (not irritating)[1] |

***Legend:*** *1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances*

**LEAD**

WARNING: Lead is a cumulative poison and has the potential to cause abortion and intellectual impairment to unborn children of pregnant workers.

**SULFURIC ACID**

Occupational exposures to strong inorganic acid mists of sulfuric acid:
**WARNING:** For inhalation exposure ONLY: This substance has been classified by the IARC as Group 1: **CARCINOGENIC TO HUMANS**

**POLYPROPYLENE**

* For pyrolyzate
for poly-alpha-olefins (PAOs):
PAOs are highly branched isoparaffinic chemicals produced by oligomerisation of 1-octene, 1-decene, and/or 1-dodecene. The crude polyalphaolefin mixture is then distilled into appropriate product fractions to meet specific viscosity specifications and hydrogenated.
Read across data exist for health effects endpoints from the following similar *hydrogenated* long chain branched alkanes derived from a C8, C10, and/or C12 alpha olefins:

- Decene homopolymer
- Decene/dodecene copolymer
- Octene/decene/dodecene copolymer
- Dodecene trimer

The data for these structural analogs demonstrated no evidence of health effects. In addition, there is evidence in the literature that alkanes with 30 or more carbon atoms are unlikely to be absorbed when administered orally. The physicochemical data suggest that it is unlikely that significant absorption will occur. If a substance of the size and structure of a typical PAO is absorbed, then the principal mechanisms of absorption after oral administration are likely to be passive diffusion and absorption by way of the lymphatic system. The former requires both good lipid solubility and good water solubility as the substance has to partition from an aqueous environment through a lipophilic membrane into another aqueous environment during absorption. Absorption by way of the lymphatics occurs by mechanisms analogous to those that absorb fatty acids and is limited by the size of the molecule. Lipophilicity generally enhances the ability of chemicals to cross biological membranes. Biotransformation by mixed function oxidases often increases the water solubility of a substance; however, existing data suggest that these substances will not undergo oxidation to more hydrophilic metabolites. Finally, a chemical must have an active functional group that can interact chemically or physically with the target cell or receptor upon reaching it; there are no moieties in PAOs that represent a functional group that may have biological activity. The water solubilities of a C10 dimer PAO and a C12 trimer PAO were determined to be <1 ppb and < 1 ppt respectively. The partition coefficient for a C12 trimer PAO was determined to be log Kow of >7 . Given the very low water solubility it is extremely unlikely that PAOs will be absorbed by passive diffusion following oral administration, and the size of the molecules suggest that the extent of lymphatic absorption is likely to be very low. Although PAOs are relatively large lipophilic compounds, and molecular size may be a critical limiting determinant for absorption, there is some evidence that these substances are absorbed. However, the lack of observed toxicity in the studies with PAOs suggests that these products are absorbed poorly, if at all. Furthermore, a review of the literature regarding the absorption and metabolism of long chain alkanes indicates that alkanes with 30+ carbon atoms are unlikely to be absorbed. For example the absorption of squalane, an analogous C30 product, administered orally to male CD rats was examined - essentially all of the squalane was recovered unchanged in the faeces. At the same time, the hydrophobic properties of PAOs suggest that, should they be absorbed, they would undergo limited distribution in the aqueous systemic circulation and reach potential target organs in limited concentrations.
In addition to the general considerations discussed above, the low volatility of PAOs indicates that, under normal conditions of use or transportation, exposure by the inhalation route is unlikely. In particular, the high viscosity of these substances suggests that it would be difficult to generate a high concentration of respirable particles in the air.
**Acute toxicity:** PAOs (decene/dodecene copolymer, octene/decene/dodecene homo-polymer, and dodecene trimer) have been adequately tested for acute oral toxicity. There were no deaths when the test materials were administered at doses of 5,000 mg/kg (decene/dodecene copolymer and dodecene trimer) and at 2,000 mg/kg (octene/decene/dodecene copolymer) in rats. Overall, the acute oral LD50 for these substances was greater than the 2000 mg/kg limit dose, indicating a relatively low order of toxicity.
PAOs (decene/dodecene copolymer, octene/decene/dodecene copolymer, and dodecene trimer) have been tested for acute dermal toxicity. No mortality was observed for any substance when administered at the limit dose of 2000 or 5000 mg/kg. Overall, the acute dermal LD50 for these substances was greater than the 2000 mg/kg limit dose, indicating a relatively low order of toxicity.
1-Decene, homopolymer, is absorbed (unexpectedly for a high molecular weight polymer) to a moderate degree in rat skin and is eliminated slowly
PAOs (decene homopolymer, decene/dodecene copolymer, and decene trimer) have been tested for acute inhalation toxicity. Rats were exposed to aerosols of the substances at nominal atmospheric concentrations of 2.5, 5.0, and 5.06 mg/L, respectively, for four hours. These levels were the maximum attainable concentrations under the conditions of the tests, due to the low volatility and high viscosity of the test material. No mortality was noted, and all animals fully recovered following depuration. The lack of mortality at concentrations at or above the limit dose of 2.0 mg/L indicates a relatively low order of toxicity for these substances.
**Repeat dose toxicity:** Eight repeated-dose toxicity studies using two different animal species, rats and mice, and oral and dermal routes of administration have been conducted with three structural analogs. These data suggest that the structural analogs exhibit a low order of toxicity following repeated applications, due to their similarity in chemical structures and physicochemical properties.
One 28-day oral toxicity study in rats, one 90-day dermal and two 90-day dietary studies in rats, and a dermal carcinogenicity study in mice exist for decene homopolymer. A rat oral combined reproductive toxicity and 91-day systemic toxicity study was also conducted with decene homopolymer. In addition, 28-day rat oral toxicity studies exist for two structurally analogous substances (dodecene trimer and octene/decene/dodecene copolymer); and a 90-day rat dermal toxicity study exists for octene/decene/dodecene copolymer. Results from these studies show a low order of repeated dose toxicity. The dermal NOAEL for systemic toxicity studies was equal to or greater than 2000 mg/kg/day.
The oral NOAEL for 1-decene homopolymer is between 5,000 and 20,000 mg/kg/day in Sprague-Dawley rats.
Rats exposed repeatedly by dermal exposure at doses of 2000 mg/kg decene/dodecene copolymer showed increased incidences of hyperplasia of the sebaceous glands, hyperplasia/hyperkeratosis of the epidermis and dermal inflammation. These symptoms generally subsided within 2 weeks. Males showed decreased body weight gain and altered serum chemistry.

Continued...

| | |
|---|---|
| | In a 90-day feeding study rats receiving 20000 ppm of 1-decene, homopolymer, hydrogenated did not exhibit any clinical signs of systemic toxicity. Marginal effects on clinical chemistry (glucose and ALT in males; sodium, phosphorus and calcium in females) were seen.<br>**Reproductive toxicity:** Data are available for decene homopolymer. Results from these studies show a low order of reproductive/ developmental toxicity. The NOAEL for reproductive toxicity was 1000 mg/kg/day, the highest concentration tested. The lack of effects on fertility in this study or effects on reproductive organs in this or other subchronic studies with closely related chemicals indicates that PAOs are unlikely to exert effects on reproduction.<br>**Developmental toxicity:** Decene homopolymer (with 10 ppm of an antioxidant) was administered once daily on gestation days 0-19 via dermal application to presumed-pregnant rats at doses of 0, 800, and 2000 mg/kg/day. Dermal administration of the test material did not adversely affect parameters of reproductive performance during gestation, nor did it adversely affect *in utero* survival and development of the offspring. The NOAEL in this study for developmental parameters was 2000 mg/kg/day.<br>**Genotoxicity:** Information for the following PAOs (decene homopolymer, octene/decene/dodecene copolymer, dodecene trimer; and decene/dodecene copolymer [*prepared from 10% C12 and 90% C10 alpha olefins; approx. 33% trimer and 51% tetramer, 16% pentamer and higher*]) is available. Either bacterial or mammalian gene mutation assays, *in vitro* chromosomal aberration assays, or *in vivo* chromosomal aberration assays have been conducted for these substances. Neither mutagenicity nor clastogenicity were exhibited by any of these substances in the referenced *in vivo* or *in vitro* tests, with or without metabolic activation.<br>**Carcinogenicity:** While alpha-olefin polymers have similar properties to mineral oils, they do not contain polycyclic aromatic hydrocarbons, or other known possible carcinogens.<br>Decene homopolymer produced no treatment-related tumors in C3H mice treated with a 50 ul/application twice weekly for 104 weeks. In addition, survival (56%) was greater than in any other group, including the untreated control. |
| **STYRENE/ BUTADIENE/ ACRYLONITRILE COPOLYMER** | Ultrafine particles (UFPs) may be produced at lower temperatures during the 3D printing process Concerns have been raised regarding airborne UFP concentrations generated while printing with ABS, as UFPs have been linked with adverse health effects |
| **CALCIUM** | The solid may react violently on contact with wet skin tissue, i.e. eyes, mouth, causing chemical and thermal burns. The acute effects include burns, ulceration, or tissue death, severe eye damage (corneal burns or opacification), and probable blindness. Inhalation of dust or fumes (especially from a fire involving calcium) will cause shortness of breath, nausea, headache, nose and respiratory tract irritation and in extreme, pneumonitis |
| **SULFURIC ACID & CALCIUM** | 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. |
| **POLYPROPYLENE & STYRENE/ BUTADIENE/ ACRYLONITRILE COPOLYMER** | The substance is classified by IARC as Group 3:<br>**NOT** classifiable as to its carcinogenicity to humans.<br>Evidence of carcinogenicity may be inadequate or limited in animal testing. |
| **TIN & CALCIUM** | No significant acute toxicological data identified in literature search. |

| | | | |
|---|---|---|---|
| **Acute Toxicity** | ✓ | **Carcinogenicity** | ✗ |
| **Skin Irritation/Corrosion** | ✓ | **Reproductivity** | ✗ |
| **Serious Eye Damage/Irritation** | ✓ | **STOT - Single Exposure** | ✗ |
| **Respiratory or Skin sensitisation** | ✗ | **STOT - Repeated Exposure** | ✗ |
| **Mutagenicity** | ✗ | **Aspiration Hazard** | ✗ |

***Legend:*** ✗ *– Data either not available or does not fill the criteria for classification*
✓ *– Data available to make classification*

## SECTION 12 Ecological information

### Toxicity

**Valve Regulated Battery Sealed Lead-Acid Battery VRLA GEL**

| Endpoint | Test Duration (hr) | Species | Value | Source |
|---|---|---|---|---|
| Not Available | Not Available | Not Available | Not Available | Not Available |

**lead**

| Endpoint | Test Duration (hr) | Species | Value | Source |
|---|---|---|---|---|
| NOEC(ECx) | Not Available | Crustacea | 0.051mg/L | 5 |
| EC50 | 72h | Algae or other aquatic plants | 1.191mg/L | 4 |
| LC50 | 96h | Fish | 1.17mg/l | 4 |
| EC50 | 96h | Algae or other aquatic plants | 0.282-0.864mg/l | 4 |

**lead dioxide**

| Endpoint | Test Duration (hr) | Species | Value | Source |
|---|---|---|---|---|
| Not Available | Not Available | Not Available | Not Available | Not Available |

**sulfuric acid**

| Endpoint | Test Duration (hr) | Species | Value | Source |
|---|---|---|---|---|
| NOEC(ECx) | Not Available | Crustacea | 0.15mg/l | 2 |

**Continued...**

| | | | | |
|---|---|---|---|---|
| EC50 | 72h | Algae or other aquatic plants | 2.56mg/l | 2 |
| LC50 | 96h | Fish | 0.75mg/l | 2 |
| EC50 | 48h | Crustacea | 3.05mg/l | 2 |

**polypropylene**

| Endpoint | Test Duration (hr) | Species | Value | Source |
|---|---|---|---|---|
| Not Available | Not Available | Not Available | Not Available | Not Available |

**styrene/ butadiene/ acrylonitrile copolymer**

| Endpoint | Test Duration (hr) | Species | Value | Source |
|---|---|---|---|---|
| Not Available | Not Available | Not Available | Not Available | Not Available |

**tin**

| Endpoint | Test Duration (hr) | Species | Value | Source |
|---|---|---|---|---|
| Not Available | Not Available | Not Available | Not Available | Not Available |

**calcium**

| Endpoint | Test Duration (hr) | Species | Value | Source |
|---|---|---|---|---|
| NOEC(ECx) | 336h | Crustacea | 32mg/l | 2 |
| EC50 | 48h | Crustacea | 49.1mg/l | 2 |

***Legend:*** *Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data*

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Prevent, by any means available, spillage from entering drains or water courses.
**DO NOT** discharge into sewer or waterways.

### Persistence and degradability

| Ingredient | Persistence: Water/Soil | Persistence: Air |
|---|---|---|
| polypropylene | LOW | LOW |

### Bioaccumulative potential

| Ingredient | Bioaccumulation |
|---|---|
| polypropylene | LOW (LogKOW = 1.6783) |

### Mobility in soil

| Ingredient | Mobility |
|---|---|
| polypropylene | LOW (KOC = 23.74) |

## SECTION 13 Disposal considerations

### Waste treatment methods

**Product / Packaging disposal**

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Management Authority for disposal.
- **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 licensed to accept chemical and / or pharmaceutical wastes or Incineration in a licensed apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

## SECTION 14 Transport information

### Labels Required

| | |
|---|---|
| |  |
| **Marine Pollutant** |  |
| **HAZCHEM** | 2R |

### Land transport (ADG)

| | |
|---|---|
| **UN number** | 2800 |
| **UN proper shipping name** | BATTERIES, WET, NON-SPILLABLE, electric storage |
| **Transport hazard class(es)** | Class: 8<br>Subrisk: Not Applicable |
| **Packing group** | Not Applicable |
| **Environmental hazard** | Environmentally hazardous |
| **Special precautions for user** | Special provisions: 238<br>Limited quantity: 1 L |

### Air transport (ICAO-IATA / DGR)

| | |
|---|---|
| **UN number** | 2800 |
| **UN proper shipping name** | Batteries, wet, non-spillable electric storage |
| **Transport hazard class(es)** | ICAO/IATA Class: 8<br>ICAO / IATA Subrisk: Not Applicable<br>ERG Code: 8L |
| **Packing group** | Not Applicable |
| **Environmental hazard** | Environmentally hazardous |
| **Special precautions for user** | Special provisions: A48 A67 A164 A183<br>Cargo Only Packing Instructions: 872<br>Cargo Only Maximum Qty / Pack: No Limit<br>Passenger and Cargo Packing Instructions: 872<br>Passenger and Cargo Maximum Qty / Pack: No Limit<br>Passenger and Cargo Limited Quantity Packing Instructions: Forbidden<br>Passenger and Cargo Limited Maximum Qty / Pack: Forbidden |

### Sea transport (IMDG-Code / GGVSee)

| | |
|---|---|
| **UN number** | 2800 |
| **UN proper shipping name** | BATTERIES, WET, NON-SPILLABLE electric storage |
| **Transport hazard class(es)** | IMDG Class: 8<br>IMDG Subrisk: Not Applicable |
| **Packing group** | Not Applicable |
| **Environmental hazard** | Marine Pollutant |
| **Special precautions for user** | EMS Number: F-A , S-B<br>Special provisions: 238<br>Limited Quantities: 1 L |

Non-spillable batteries are not subject to Dangerous Goods Transport requirements if conditions specified in the applicable Special provisions are met. Applicable special provisions: 238 (ADR, ADN, ADG, IMDG, UN) or A67 (IATA).

### Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

### Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

| Product name | Group |
|---|---|
| lead | Not Available |
| lead dioxide | Not Available |
| sulfuric acid | Not Available |
| polypropylene | Not Available |
| styrene/ butadiene/ acrylonitrile copolymer | Not Available |
| tin | Not Available |
| calcium | Not Available |

### Transport in bulk in accordance with the ICG Code

| Product name | Ship Type |
|---|---|
| lead | Not Available |
| lead dioxide | Not Available |

Continued...

| Product name | Ship Type |
|---|---|
| sulfuric acid | Not Available |
| polypropylene | Not Available |
| styrene/ butadiene/ acrylonitrile copolymer | Not Available |
| tin | Not Available |
| calcium | Not Available |

## SECTION 15 Regulatory information

### Safety, health and environmental regulations / legislation specific for the substance or mixture

**lead is found on the following regulatory lists**

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 4
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2B: Possibly carcinogenic to humans

**lead dioxide is found on the following regulatory lists**

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australia Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP) - Schedule 10 / Appendix C
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
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 2A: Probably carcinogenic to humans

**sulfuric acid is found on the following regulatory lists**

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs - Group 1: Carcinogenic to humans

**polypropylene is found on the following regulatory lists**

Australian Inventory of Industrial Chemicals (AIIC)
Chemical Footprint Project - Chemicals of High Concern List
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

**styrene/ butadiene/ acrylonitrile copolymer is found on the following regulatory lists**

Australian Inventory of Industrial Chemicals (AIIC)
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

**tin is found on the following regulatory lists**

Australian Inventory of Industrial Chemicals (AIIC)

**calcium is found on the following regulatory lists**

Australia Hazardous Chemical Information System (HCIS) - Hazardous Chemicals
Australian Inventory of Industrial Chemicals (AIIC)

### National Inventory Status

| National Inventory | Status |
|---|---|
| Australia - AIIC / Australia Non-Industrial Use | Yes |
| Canada - DSL | Yes |
| Canada - NDSL | No (lead; lead dioxide; sulfuric acid; polypropylene; styrene/ butadiene/ acrylonitrile copolymer; tin; calcium) |
| China - IECSC | Yes |
| Europe - EINEC / ELINCS / NLP | No (polypropylene; styrene/ butadiene/ acrylonitrile copolymer) |
| Japan - ENCS | No (lead; tin; calcium) |
| Korea - KECI | Yes |
| New Zealand - NZIoC | Yes |
| Philippines - PICCS | Yes |
| USA - TSCA | Yes |
| Taiwan - TCSI | Yes |
| Mexico - INSQ | Yes |
| Vietnam - NCI | Yes |
| Russia - FBEPH | Yes |
| ***Legend:*** | *Yes = All CAS declared ingredients are on the inventory*<br>*No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.* |

## SECTION 16 Other information

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|---|---|
| **Revision Date** | 06/01/2021 |

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| | |
|---|---|
| **Initial Date** | 26/08/2014 |

### SDS Version Summary

| Version | Date of Update | Sections Updated |
|---|---|---|
| 8.1.1.1 | 23/12/2020 | Acute Health (eye), Acute Health (inhaled), Acute Health (skin), Acute Health (swallowed), Chronic Health, Classification, Disposal, Engineering Control, Environmental, Exposure Standard, Fire Fighter (fire/explosion hazard), Fire Fighter (fire incompatibility), First Aid (eye), First Aid (inhaled), First Aid (skin), First Aid (swallowed), Handling Procedure, Ingredients, Personal Protection (other), Personal Protection (Respirator), Personal Protection (eye), Personal Protection (hands/feet), Spills (major), Spills (minor), Storage (storage incompatibility), Storage (suitable container), Toxicity and Irritation (Other) |
| 10.1.1.1 | 06/01/2021 | Classification, Ingredients |
| 10.1.2.1 | 27/04/2021 | Regulation Change |
| 10.1.3.1 | 04/05/2021 | Regulation Change |
| 10.1.4.1 | 07/05/2021 | Regulation Change |
| 10.1.5.1 | 11/05/2021 | Regulation Change |
| 10.1.5.2 | 30/05/2021 | Template Change |
| 10.1.5.3 | 04/06/2021 | Template Change |
| 10.1.5.4 | 05/06/2021 | Template Change |
| 10.1.6.4 | 08/06/2021 | Regulation Change |
| 10.1.6.5 | 09/06/2021 | Template Change |
| 10.1.6.6 | 11/06/2021 | Template Change |
| 10.1.6.7 | 15/06/2021 | Template Change |
| 10.1.7.7 | 18/06/2021 | Regulation Change |
| 10.1.8.7 | 22/06/2021 | Regulation Change |
| 10.1.8.8 | 05/07/2021 | Template Change |
| 10.1.9.8 | 14/07/2021 | Regulation Change |
| 10.1.10.8 | 20/07/2021 | Regulation Change |
| 10.1.10.9 | 01/08/2021 | Template Change |
| 10.1.11.9 | 03/08/2021 | Regulation Change |
| 10.1.12.9 | 05/08/2021 | Regulation Change |

### Other information

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.

The 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.

### Definitions and abbreviations

PC－TWA: Permissible Concentration-Time Weighted Average
PC－STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit。
IDLH: Immediately Dangerous to Life or Health Concentrations
ES: Exposure Standard
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index
AIIC: Australian Inventory of Industrial Chemicals
DSL: Domestic Substances List
NDSL: Non-Domestic Substances List
IECSC: Inventory of Existing Chemical Substance in China
EINECS: European INventory of Existing Commercial chemical Substances
ELINCS: European List of Notified Chemical Substances
NLP: No-Longer Polymers
ENCS: Existing and New Chemical Substances Inventory
KECI: Korea Existing Chemicals Inventory
NZIoC: New Zealand Inventory of Chemicals
PICCS: Philippine Inventory of Chemicals and Chemical Substances
TSCA: Toxic Substances Control Act
TCSI: Taiwan Chemical Substance Inventory
INSQ: Inventario Nacional de Sustancias Químicas
NCI: National Chemical Inventory
FBEPH: Russian Register of Potentially Hazardous Chemical and Biological Substances

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**end of SDS**