ALBEMARLE®

# SAFETY DATA SHEET

048-GHS

# Lithium Hydroxide Monohydrate

**Preparation Date :** 17-May-2017 **Revision Date:** 01-Sep-2017 **Revision Number** 3.04

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

**Product Identifier**

| | |
|---|---|
| **Product Name** | Lithium Hydroxide Monohydrate |

**Other means of identification**

| | |
|---|---|
| **Chemical Family** | Inorganic catalyst |
| **CAS-No** | 1310-66-3 |
| **Formula** | $LiOH.H_2O$ |

**Recommended use of the chemical and restrictions on use**

| | |
|---|---|
| **General function** | Raw material, Lubricant assistants. |
| **Uses advised against** | No information available |

**Details of the supplier of the safety data sheet**

**Company**

Albemarle Corporation
451 Florida Street
Baton Rouge, LA 70801

Albemarle U.S., Inc.
348 Holiday Inn Drive
Kings Mountain, NC 28086

| | |
|---|---|
| **For Non-Emergency** | 704-739-2501 (8AM-5PM M-Th; 8AM-12PM Fri) |
| **'Competent Body for SDS'** | Department of product safety<br>productsafety@albemarle.com |

**Emergency telephone number**

| | |
|---|---|
| **Emergency Telephone Numbers** | In case of emergency, call Albemarle emergency response at +1 225 344 7147 |

## 2. HAZARDS IDENTIFICATION

**Classification**

| | |
|---|---|
| Acute Toxicity - Oral | Category 4 |
| Skin Corrosion/irritation | Category 1 Sub-category B |
| Serious eye damage/eye irritation | Category 1 |
| Acute aquatic toxicity | Category 3 |

**Label elements**

**Emergency Overview**

**Danger**

**Hazard Statements**

Harmful if swallowed
Causes severe skin burns and eye damage
Harmful to aquatic life

**Physical state** Powder **Color** White to yellow. **Odor** Odorless.

**Prevention**
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Do not breathe dust/fume/gas/mist/vapors/spray
Wear protective gloves/protective clothing/eye protection/face protection
Avoid release to the environment

**Response**

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a POISON CENTER or doctor/physician
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Immediately call a POISON CENTER or doctor/physician
Wash contaminated clothing before reuse
IF INHALED: Remove person to fresh air and keep comfortable for breathing Immediately call a POISON CENTER or doctor/physician
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell Rinse mouth Do not induce vomiting

**Storage**
Store locked up

**Disposal**
Dispose of contents/container to an approved waste disposal plant

**Hazards not otherwise classified (HNOC)**
Not applicable
**Other Information**

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Pure substance/mixture** Substance

| Component | CAS-No | Weight % |
|---|---|---|
| Lithium Hydroxide Monohydrate | 1310-66-3 | >99 |

Note: The exact concentrations of the above listed chemicals are being withheld as a trade secret.

## 4. FIRST AID MEASURES

**First aid measures**

| | |
|---|---|
| **General Advice** | First aid responders should pay attention to self-protection and use the recommended protective clothing. Immediate medical attention is required. Take off contaminated clothing and shoes immediately. Keep warm and in a quiet place. |
| **Eye contact** | Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician. |
| **Skin contact** | Wash off immediately with plenty of water for at least 15 minutes. Call a physician |

| | |
|---|---|
| | immediately. |
| **Inhalation** | IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If breathing has stopped, apply artificial respiration. If symptoms persist, call a physician. |
| **Ingestion** | Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. Do not induce vomiting. Call a physician immediately. |
| **Protection of First-aiders** | Use personal protective equipment. |

**Most important symptoms and effects, both acute and delayed**

| | |
|---|---|
| **Symptoms** | Causes severe burns. Irritating to eyes, respiratory system and skin. |

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

| | |
|---|---|
| **Notes to Physician** | Treat symptomatically. |

## 5. FIRE-FIGHTING MEASURES

**Extinguishing media**

| | |
|---|---|
| **Suitable extinguishing media** | The product is not flammable. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Water spray jet, Foam, Dry powder, Carbon dioxide (CO2). |
| **Unsuitable Extinguishing Media** | Do not use direct application of concentrated water streams; application of water fog (mist) is quite acceptable. High volume water jet. |

**Specific Hazards Arising from the Chemical**

| | |
|---|---|
| **Combustion/explosion hazards** | High temperatures may liberate toxic or corrosive gases. |
| **Hazardous Combustion Products** | Lithium compounds. |

**Explosion Data**

| | |
|---|---|
| **Sensitivity to mechanical impact** | None. |
| **Sensitivity to static discharge** | None. |

**Protective Equipment and Precautions for Firefighters**

Wear self-contained breathing apparatus and protective suit. Use water spray to cool unopened containers. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Do not use water on fire, due to potential evolution of toxic fumes or dangerous reactions.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment and emergency procedures**

| | |
|---|---|
| **Personal precautions** | Ensure adequate ventilation. Wear suitable protective equipment. Avoid contact with skin, eyes and clothing. Do not breathe dust. Keep people away from and upwind of spill/leak. |

**Environmental Precautions**

| | |
|---|---|
| **Environmental precautions** | Do not flush into surface water or sanitary sewer system. Avoid release to the environment Sweep up and shovel into suitable containers for disposal. |

**Methods and material for containment and cleaning up**

| | |
|---|---|
| **Methods for Containment** | Prevent further leakage or spillage if safe to do so. |
| **Methods for Cleaning up** | Sweep up and shovel into suitable containers for disposal. |

## 7. HANDLING AND STORAGE

**Precautions for safe handling**

| | |
|---|---|
| **Handling** | Avoid dust formation. Provide appropriate exhaust ventilation at places where dust is |

formed. Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Do not eat, drink or smoke when using this product Handle in accordance with good industrial hygiene and safety practice.

**Conditions for safe storage, including any incompatibilities**

| | |
|---|---|
| **Storage** | Keep container tightly closed in a dry and well-ventilated place. Protect from moisture. Keep away from direct sunlight. Keep away from heat. |
| **Incompatible Materials** | Avoid extremely high heat. Protect from light. Avoid contact with acids. Avoid contact with metals. |

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Control parameters**

**Exposure Guidelines** .

| Component | CAS-No | ACGIH TLV (TWA) | OSHA PEL (TWA) | NIOSH IDLH |
|---|---|---|---|---|
| Lithium Hydroxide Monohydrate | 1310-66-3 | - | - | - |

| Component | CAS-No | Alberta | British Columbia | Ontario | Quebec |
|---|---|---|---|---|---|
| Lithium Hydroxide Monohydrate | 1310-66-3 | - | - | STEL: 1 mg/m$^3$ | - |

**Appropriate engineering controls**

| | |
|---|---|
| **Engineering Controls** | Ensure adequate ventilation. Mechanical ventilation is recommended. |

**Individual protection measures, such as personal protective equipment**

| | |
|---|---|
| **Eye/face Protection** | Tightly fitting safety goggles, full face air purifying respirator, powered air purifying, or supplied air hood. NOTE: Product may cause skin irritation where perspiration occurs between PPE and skin. |
| **Skin Protection** | If skin contact or contamination of clothing is likely, protective clothing should be worn. |
| **Hand protection** | Gloves resistant to chemical permeation. |
| **Respiratory protection** | Approved dust respirator. |
| **General Hygiene Considerations** | Take off contaminated clothing and shoes immediately. Avoid contact with skin, eyes and clothing. Do not breathe dust. Keep away from food, drink and animal feeding stuffs. Wash hands before breaks and at the end of workday. Do not eat, drink or smoke when using this product. Handle in accordance with good industrial hygiene and safety practice. |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Information on basic physical and chemical properties**

| | |
|---|---|
| **Physical state** | Powder |
| **Color** | White to yellow. |
| **Odor** | Odorless. |
| **Odor Threshold** | None |
| **Molecular Weight** | No data available |
| **pH** | approx 12 (0.4 g/L Solution) |
| **Melting point/freezing point** | 424 °C / 795 - °F |
| **Boiling Point/Range** | No data available |
| **Flash Point** | Not applicable |
| **Evaporation Rate** | No data available. |
| **Flammability (solid, gas)** | No data available |
| **Flammability Limit in Air** | |
| **Upper flammability limit:** | No data available |
| **Lower flammability limit:** | No data available |
| **Vapor Pressure** | No information available |

| | |
|---|---|
| **Vapor Density** | No data available |
| **Density** | 1.51 (20°C) |
| **Solubility(ies)** | |
| **Water Solubility** | approx 216 g/L (20°C) |
| **Solubility in other solvents** | No data available |
| **Partition coefficient** | No data available |
| **Autoignition temperature** | No data available Not applicable |
| **Decomposition temperature** | 100 °C (Releases water) |
| **Viscosity, kinematic** | No data available |
| **Dynamic viscosity** | No data available |
| **Explosive Properties** | No data available |
| **Oxidizing Properties** | No data available |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| **Reactivity Hazard** | Lithium Hydroxide Monohydrate may react with carbon dioxide in air to form lithium carbonate. |
| **Stability** | Stable. |
| **Hazardous Reactions** | May react with strong acids generating heat with boiling and spattering. |
| **Hazardous Polymerization** | Hazardous polymerisation does not occur. |
| **Conditions to Avoid** | Keep away from direct sunlight. Keep away from heat. |
| **Materials to avoid** | Strong acids. Avoid contact with amphoteric metal (e.g. aluminium, lead, zinc). |
| **Hazardous decomposition products** | Thermal decomposition of the components of Lithium Hydroxide Monohydrate include lithium compounds and caustic vapors. |

## 11. TOXICOLOGICAL INFORMATION

**Information on likely routes of exposure**

| | |
|---|---|
| **Inhalation** | Yes. |
| **Eye contact** | Yes. |
| **Skin contact** | Yes. |
| **Ingestion** | Harmful if swallowed. If swallowed, severe burns to the mouth, throat and gastrointestinal tissues will occur. Symptoms of such overexposure can include abdominal pain, nausea and vomiting. |

**Potential Health Effects**

**Acute Effects**

| | |
|---|---|
| **Skin Corrosion/irritation** | Causes severe burns. |
| **Serious eye damage/eye irritation** | Causes severe eye damage. |
| **Respiratory irritation** | Inhalation of airborne dusts of Lithium Hydroxide Monohydrate may severely irritate or damage the tissues of the eyes, nose, and respiratory system. Symptoms of overexposure can include cough, sneezing, and a sore throat. Overexposure may damage the tissues of the respiratory tract, which can lead to the development of breathing difficulty, chemical pneumonitis, and pulmonary edema. Severe inhalation overexposure may be fatal. |
| **Sensitization** | Not expected to be a sensitizer. |
| **STOT - single exposure** | No information available. |

**Chronic Effects**

**Mutagenic Effects** Lithium Hydroxide Monohydrate is not reported to cause mutagenic effects in humans and tested negative in in-vitro and in-vivo tests.

**Carcinogenicity** There are no known carcinogenic chemicals in this product.

| Component | CAS-No | ACGIH Carcinogens | IARC | NTP | OSHA Carcinogens |
|---|---|---|---|---|---|
| Lithium Hydroxide Monohydrate | 1310-66-3 | - | - | - | |

**Reproductive Effects** No toxicity to reproduction.

**STOT - repeated exposure** No information available.

**Chronic Effects** Prolonged or repeated exposure to skin causes defatting and dermatitis. CNS effects may occur. Repeated or prolonged overexposure may cause damage to the kidneys.

**Aspiration hazard** Not applicable.

**Numerical measures of toxicity**

**Product Information**

**The following values are calculated based on chapter 3.1 of the GHS document** .

| | |
|---|---|
| **ATEmix (dermal)** | 2011 mg/kg |
| **LD50 Oral:** | Rat Oral LD50: 578 mg/kg |
| **LD50 Dermal:** | Rat Dermal LD50: > 2000 mg/kg |
| **Inhalation LC50:** | LC50/inhalation/4h/rat : > 6.15 mg/L |

**Component Information**

| Component | Rat Oral LD50: | Rabbit Dermal LD50: | Rat Dermal LD50 : | Rat Inhalation LC50: |
|---|---|---|---|---|
| Lithium Hydroxide Monohydrate<br>1310-66-3 | 578 mg/kg | - | > 2000 mg/kg | > 6.15 mg/L (4h) |

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

Harmful to aquatic life

LC50/96h/fish: 109 mg/L ( Brachydanio rerio (zebra fish) ) OECD Test No. 203: Fish, Acute Toxicity Test
EC50/48h/Daphnia : 33.5 mg/L OECD Test No. 202: Daphnia sp., Acute Immobilization Test
ErC50/72h/algae : Growth rate 153.44 mg/L (Pseudokirchnerella subspicata) OECD Test No. 201: Freshwater Alga and Cyanobacteria, Growth Inhibition Test
Fish early-life stage (FELS) toxicity test (OECD 210): Pimephales promelas (fathead minnow), NOEC: 17.35 mg/l
Daphnia magna Reproduction Test (21 days): NOEC: 4 mg/l OECD Test No. 211: Daphnia magna Reproduction Test
Growth rate (Pseudokirchnerella subspicata): NOEC 10 mg/l OECD Test No. 201: Freshwater Alga and Cyanobacteria, Growth Inhibition Test

| Component | Freshwater Algae EC50/72h : | Freshwater Fish LC50/96h : | Water Flea EC50/48h : |
|---|---|---|---|
| Lithium Hydroxide Monohydrate (CAS #: 1310-66-3) | 153.44 mg/l | 109 mg/l | 33.5 mg/l |

**Persistence/Degradability** Not applicable. Inorganic substance.

**Bioaccumulation/ Accumulation** Not likely to bioaccumulate.

**Mobility in Environmental Media** No information available.

**Other adverse effects** Due to it corrosivity, Lithium Hydroxide Monohydrate can be harmful or fatal to aquatic plants and animals in contaminated bodies of water.

## 13. DISPOSAL CONSIDERATIONS

**Waste treatment methods**

| | |
|---|---|
| **Waste Disposal Method** | Disposal should be in accordance with applicable regional, national and local laws and regulations. |
| **Contaminated Packaging** | Do not reuse container. |

## 14. TRANSPORT INFORMATION

**DOT**

| | |
|---|---|
| **Proper Shipping Name** | Lithium Hydroxide |
| **Hazard Class** | 8 |
| **UN No.** | 2680 |
| **Packing Group** | II |
| **Marine Pollutant:** | No |
| **Description** | UN 2680, Lithium Hydroxide, 8, II |

| | |
|---|---|
| **TDG** | This material is considered as Dangerous Goods per regulations of Transport Canada. The use of the above US DOT information from US 49 CDR regulations is allowed for shipments that originate in the United States. |

**IMDG/IMO**

| | |
|---|---|
| **IMO Class** | 8 |
| **Packing Group** | II |
| **UN-No** | 2680 |
| **IMO Labelling and Marking** | 8 |
| **Proper Shipping Name** | Lithium Hydroxide |
| **EmS** | F-A, S-B |
| **Transport Description** | UN 2680, Lithium Hydroxide, 8, II |

**IATA/ICAO**

| | |
|---|---|
| **IATA/ICAO Class** | 8 |
| **Packing Group** | II |
| **UN-No** | 2680 |
| **IATA/ICAO Labelling/Marking** | CORROSIVE (8) |
| **Passenger Aircraft** | Maximum net quantity per package: 15 kg |
| **Cargo aircraft only** | Maximum net quantity per package: 50 kg |
| **Proper shipping name** | Lithium Hydroxide |
| **Transport Description** | UN 2680, Lithium Hydroxide, 8, II |

## 15. REGULATORY INFORMATION

| International Inventories | TSCA | DSL | NDSL | AICS | EINECS | ENCS | KECL | PICCS | IECSC | NZIoC | TCSI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lithium Hydroxide Monohydrate | - | - | - | X | - | X | - | X | X | X | X |

(X) Complies (-) Does not Comply

On some chemical inventory lists, Lithium Hydroxide Monohydrate is considered a statory mixture of Lithium Hydroxide (CAS#1310-65-2) and Water (CAS#7732-18-5).

**SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

**SARA 311/312 Hazardous Categorization**

| | |
|---|---|
| **Acute Health Hazard** | Yes |
| **Chronic Health Hazard** | No |
| **Fire Hazard** | No |
| **Sudden Release of Pressure Hazard** | No |

**Reactive Hazard** No

**Reportable and Threshold Planning Quantities**
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

**State Right-to-Know**
No components subject to "Right-To-Know" legislation in the following States; California, Massachusetts, New Jersey, and Pennsylvania.

| Component | California Prop. 65 | New Jersey | Massachusetts | Pennsylvania |
|---|---|---|---|---|
| Lithium Hydroxide Monohydrate (CAS #: 1310-66-3) | - | X | - | - |

## 16. OTHER INFORMATION

| | | | | |
|---|---|---|---|---|
| **NFPA** | Health 3 | Flammability 0 | Instability 0 | Physical Hazards - |
| **HMIS** | Health 3 | Flammability 0 | Physical Hazards 0 | |

* = Chronic Health Hazard

**Prepared By** Health & Environment DepartmentAlbemarle Corporation

FOR ADDITIONAL NONEMERGENCY PRODUCT INFORMATION, CONTACT:

HEALTH AND ENVIRONMENT DEPARTMENT
ALBEMARLE CORPORATION
451 FLORIDA ST.
BATON ROUGE, LA. 70801
(800) 535-3030

**Preparation Date :** 17-May-2017
**Revision Date:** 01-Sep-2017

**Disclaimer:**
The information contained herein is accurate to the best of our knowledge. The Company makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances.

**End of Safety Data Sheet**

# SODIUM SULPHATE, ANHYDROUS

Version 1.0 Revision Date 16.10.2017 Print Date 17.10.2017

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

### 1.1 Product identifier

Trade name : SODIUM SULPHATE, ANHYDROUS
Registration number : 01-2119519226-43

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

Use of the Substance/Mixture : Raw material for chemical industry., Laboratory chemicals

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

Company : Albemarle Germany GmbH
Industriepark Höchst, Gebäude G 879
65926 Frankfurt a.M.
Telephone : +49 69 40 12 6-0
Telefax : +49 69 40 12 6-7 2000

Contact person product safety
Telephone : +49(0)5326 51-1292
E-mail address : productsafety@albemarle.com

### 1.4 Emergency telephone number

Emergency telephone number : +32 (0) 70-233-201 (EUROPE)
(+1)225-344-7147 (US and WORLDWIDE)
+65-6733-1661 (ASIA PACIFIC)

NHS Direct
111

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

**Classification (REGULATION (EC) No 1272/2008)**

Not a hazardous substance or mixture according to Regulation (EC) No. 1272/2008.

### 2.2 Label elements

Not a hazardous substance or mixture according to Regulation (EC) No. 1272/2008.

### 2.3 Other hazards

The information required is contained in this Material Safety Data Sheet.

**Results of PBT and vPvB assessment**

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

CAS-No.: 7757-82-6 , CAS Name: sodium sulphate , EINECS-No.: 231-820-9 , REACH No.: 01-2119519226-43

### 3.2 Mixtures

Chemical nature : Inorganic compound

Remarks : No hazardous ingredients

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

| | | |
|---|---|---|
| General advice | : | First Aid responders should pay attention to self-protection and use the recommended protective clothing<br>Take off contaminated clothing and shoes immediately.<br>Move out of dangerous area.<br>Keep warm and in a quiet place. |
| If inhaled | : | Provide fresh air.<br>If not breathing, give artificial respiration.<br>Keep the victim calm and in a semi-upright position.<br>If symptoms persist, call a physician. |
| In case of skin contact | : | Wash off with soap and water.<br>If symptoms persist, call a physician. |
| In case of eye contact | : | Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.<br>Call a physician immediately. |
| If swallowed | : | Clean mouth with water and drink afterwards plenty of water.<br>Never give anything by mouth to an unconscious person.<br>Do NOT induce vomiting.<br>If symptoms persist, call a physician. |

### 4.2 Most important symptoms and effects, both acute and delayed

| | | |
|---|---|---|
| Symptoms | : | Vomiting<br>Nausea |

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

| | | |
|---|---|---|
| Treatment | : | Treat symptomatically.<br>For specialist advice physicians should contact the Poisons Information Service. |

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

| | | |
|---|---|---|
| Suitable extinguishing media | : | Water spray jet<br>Foam<br>Carbon dioxide (CO2)<br>Dry powder |
| Unsuitable extinguishing media | : | High volume water jet |

### 5.2 Special hazards arising from the substance or mixture

| | | |
|---|---|---|
| Specific hazards during firefighting | : | Hazardous decomposition products formed under fire conditions.<br>Sulphur oxides |

### 5.3 Advice for firefighters

| | | |
|---|---|---|
| Special protective equipment for firefighters | : | Wear full protective clothing and self-contained breathing apparatus. |
| Further information | : | Collect contaminated fire extinguishing water separately. This must not be discharged into drains.<br>Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. |

## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

| | | |
|---|---|---|
| Personal precautions | : | Ensure adequate ventilation.<br>Wear personal protective equipment.<br>Avoid contact with skin, eyes and clothing.<br>Do not breathe dust.<br>Keep people away from and upwind of spill/leak. |

### 6.2 Environmental precautions

| | | |
|---|---|---|
| Environmental precautions | : | Do not flush into surface water or sanitary sewer system.<br>Avoid subsoil penetration. |

### 6.3 Methods and materials for containment and cleaning up

| | | |
|---|---|---|
| Methods for cleaning up | : | Use mechanical handling equipment.<br>Avoid dust formation.<br>Pick up and transfer to properly labelled containers.<br>Adequate disposal |

### 6.4 Reference to other sections

See chapter 8 and 13

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

| | | |
|---|---|---|
| Advice on safe handling | : | Provide sufficient air exchange and/or exhaust in work rooms. |

Wear personal protective equipment.
Handle in accordance with good industrial hygiene and safety practice.
In general, emissions are controlled and prevented by implementing an appropriate management system, including regular informing and training workers.

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

### 7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Keep containers tightly closed in a dry, cool and well-ventilated place.

Advice on common storage : No materials to be especially mentioned.

### 7.3 Specific end use(s)

Specific use(s) : Raw material for chemical industry., Laboratory chemicals

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

Contains no substances with occupational exposure limit values.

**Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:**

| Substance name | End Use | Exposure routes | Potential health effects | Value |
|---|---|---|---|---|
| sodium sulphate | Workers DNEL | Inhalation | Long-term systemic effects | 20 mg/m3 |
| | Workers DNEL | Inhalation | Long-term local effects | 20 mg/m3 |

**Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:**

| Substance name | Environmental Compartment | Value |
|---|---|---|
| sodium sulphate | Fresh water | 11.09 mg/l |
| | Marine water | 1.109 mg/l |
| | Fresh water sediment | 40.2 mg/kg dry weight (d.w.) |
| | Marine sediment | 4.02 mg/kg dry weight (d.w.) |
| | Behaviour in waste water treatment plants | 800 mg/l |
| | Soil | 1.54 mg/kg dry weight (d.w.) |

### 8.2 Exposure controls

**Engineering measures**

Provide sufficient air exchange and/or exhaust in work rooms.

**Personal protective equipment**

Respiratory protection : In case of insufficient ventilation wear suitable respiratory equipment.
For short-time or low exposures, use breathing apparatus with a filter.
Recommended Filter type:
Half mask with a particle filter P1.
For intensive or prolonged exposure, use a self-contained breathing apparatus.

Hand protection : Glove material: Wear suitable gloves.
Protective gloves complying with EN 374.

: Glove material: Nitrile rubber
Break through time:: > 480 min
Glove thickness: 0.11 mm

: The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other.
The exact break through time can be obtained from the protective glove producer and this has to be observed.
Protective gloves have to be replaced at the first sign of deterioration.

Eye protection : Tightly fitting safety goggles
Eye protection (EN 166)

Skin and body protection : chemical resistant protective clothing

Hygiene measures : Take off contaminated clothing and shoes immediately.
Avoid contact with skin, eyes and clothing.
Do not breathe dust.
Smoking, eating and drinking should be prohibited in the application area.
Keep away from food, drink and animal feedingstuffs.
Wash hands before breaks and at the end of workday.

Protective measures : Facilities storing or utilizing this material should be equipped with an eyewash facility and safety shower.
Handle in accordance with good industrial hygiene and safety practice.

**Environmental exposure controls**

General advice : Do not flush into surface water or sanitary sewer system.
Avoid subsoil penetration.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

Appearance : solid

| | | |
|---|---|---|
| Colour | : | white |
| Odour | : | odourless |
| Odour Threshold | : | No data available |
| Flash point | : | Not applicable |
| Ignition temperature | : | Not applicable |
| Lower explosion limit | : | No data available |
| Upper explosion limit | : | No data available |
| Flammability (solid, gas) | : | No data available |
| Flammability of liquid | : | No data available |
| Oxidizing properties | : | No data available |
| Auto-ignition temperature | : | not auto-flammable |
| Burning number | : | No data available |
| Molecular weight | : | 142.04 g/mol |
| pH | : | 5.2 - 8.0<br>at 50 g/l<br>20 °C |
| Melting point/ range | : | ca. 888 °C |
| Boiling point/boiling range | : | Decomposes below the boiling point. |
| Sublimation point | : | No data available |
| Vapour pressure | : | Not applicable |
| Density | : | 2.7 g/cm3<br>at 20 °C |
| Relative density | : | No data available |
| Bulk density | : | ca.1,400 - 1,600 kg/m3 |
| Water solubility | : | 445.5 g/l<br>at 20 °C<br>pH 5.2<br>Method: OECD Test Guideline 105 |
| Partition coefficient: n-octanol/water | : | Not applicable |
| Solubility in other solvents | : | No data available |
| Viscosity, dynamic | : | No data available |

Viscosity, kinematic : No data available

Flow time : No data available

Impact sensitivity : No data available

Relative vapour density : No data available

Surface tension : No data available

Evaporation rate : No data available

### 9.2 Other information

Explosivity : no explosion risk

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

No hazards to be specially mentioned.

### 10.2 Chemical stability

Stable under normal conditions.

### 10.3 Possibility of hazardous reactions

Hazardous reactions : No dangerous reaction known under conditions of normal use.

### 10.4 Conditions to avoid

Conditions to avoid : No conditions to be specially mentioned.

### 10.5 Incompatible materials

Materials to avoid : No materials to be especially mentioned.

### 10.6 Hazardous decomposition products

Risk of decomposition. : No decomposition if stored and applied as directed.

Thermal decomposition : To avoid thermal decomposition, do not overheat.

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

**Acute toxicity**

Acute oral toxicity : LD50: > 2,000 mg/kg
Species: Rat
Method: OECD Test Guideline 423
GLP: yes

**Skin corrosion/irritation**

Skin irritation : Species: Rabbit
Result: No skin irritation

Method: OECD Test Guideline 404
GLP: yes
Exposure time: 4 h

**Serious eye damage/eye irritation**

| | |
|---|---|
| Eye irritation | : Species: Rabbit<br>Result: slight irritation<br>Method: Regulation (EC) No. 440/2008, Annex, B.5<br>GLP: yes<br>Exposure time: 24 h<br>Based on available data, the classification criteria are not met. |

**Respiratory or skin sensitisation**

| | |
|---|---|
| Sensitisation | : Maximisation Test<br>Species: Guinea pig<br>Result: Does not cause skin sensitisation.<br>Method: OECD Test Guideline 406<br>GLP: yes |

**Germ cell mutagenicity**

| | |
|---|---|
| Genotoxicity in vitro | : Ames test<br>Salmonella typhimurium<br>with and without metabolic activation<br>Result: negative |

## SECTION 12: Ecological information

### 12.1 Toxicity

| | |
|---|---|
| Toxicity to fish | : static test<br>LC50: 120 mg/l<br>Exposure time: 96 h<br>Species: Gambusia affinis (Mosquito fish)<br>Information taken from reference works and the literature. |
| Toxicity to daphnia and other aquatic invertebrates | : static test EC50: 2,564 mg/l<br>Exposure time: 48 h<br>Species: Daphnia magna (Water flea)<br>Information taken from reference works and the literature. |

### 12.2 Persistence and degradability

| | |
|---|---|
| Biodegradability | : The methods for determining biodegradability are not applicable to inorganic substances. |

### 12.3 Bioaccumulative potential

Bioaccumulation : No data available

**12.4 Mobility in soil**

Physico-chemical removability : No data available

**12.5 Results of PBT and vPvB assessment**

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

**12.6 Other adverse effects**

Additional ecological information : slightly water endangering

: Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration.

## SECTION 13: Disposal considerations

**13.1 Waste treatment methods**

Product : Dispose of in accordance with local regulations.

Contaminated packaging : Dispose of in accordance with local regulations.

Waste Code : Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.

## SECTION 14: Transport information

**14.1 UN number**

Not regulated as a dangerous good

**14.2 UN proper shipping name**

Not regulated as a dangerous good

**14.3 Transport hazard class(es)**

Not regulated as a dangerous good

**14.4 Packing group**

Not regulated as a dangerous good

**14.5 Environmental hazards**

Not regulated as a dangerous good

**14.6 Special precautions for user**

Not applicable

**14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

## SECTION 15: Regulatory information

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

| | |
|---|---|
| REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). | : This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57). |
| Major Accident Hazard Legislation | : Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.<br>Not applicable |
| Other regulations | : The product does not need to be labelled in accordance with EC directives or respective national laws.<br>Regional or national implementations of GHS may not implement all hazard classes and categories. |
| | : Take note of Dir 94/33/EC on the protection of young people at work.<br>Occupational restrictions for pregnant and breast feeding women |

**Notification status**

| | |
|---|---|
| REACH | : This substance has been registered according to Regulation (EC) No. 1907/2006 (REACH).<br>sodium sulphate |
| DSL | : All components of this product are on the Canadian DSL |
| AICS | : On the inventory, or in compliance with the inventory |
| NZIoC | : Not listed<br>sodium sulphate |
| ENCS | : On the inventory, or in compliance with the inventory |
| ISHL | : On the inventory, or in compliance with the inventory |
| KECI | : On the inventory, or in compliance with the inventory |
| PICCS | : On the inventory, or in compliance with the inventory |
| IECSC | : On the inventory, or in compliance with the inventory |
| TCSI | : On the inventory, or in compliance with the inventory |
| TSCA | : On TSCA Inventory |

### 15.2 Chemical safety assessment

A Chemical Safety Assessment is not required for this substance.

## SECTION 16: Other information

**Further information**

The information provided is based on our current knowledge and experience and apply to the product as delivered. Regarding the product properties, these are not guaranteed. The delivery of this safety datasheet does not free the recipient of the product from his own responsibility to follow the relevant rules and regulations concerning this product.

# Coogee Chemicals Caustic Soda 50%

**Coogee Chemicals Pty Ltd**

Chemwatch Hazard Alert Code: **4**

Chemwatch: **1735895**
Version No: **4.1.1.1**
Safety Data Sheet according to WHS and ADG requirements

Issue Date: **12/02/2015**
Print Date: **13/02/2017**
L.GHS.AUS.EN

## SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

### Product Identifier

| | |
|---|---|
| **Product name** | Coogee Chemicals Caustic Soda 50% |
| **Proper shipping name** | SODIUM HYDROXIDE SOLUTION |
| **Other means of identification** | Not Available |

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

| | |
|---|---|
| **Relevant identified uses** | Laboratory applications. |

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

| | |
|---|---|
| **Registered company name** | Coogee Chemicals Pty Ltd |
| **Address** | Cnr of Patterson and Kwinana Beach Roads Kwinana WA Australia |
| **Telephone** | +61 8 9439 8200 |
| **Fax** | +61 8 9439 8300 |
| **Website** | www.coogee.com.au |
| **Email** | businessrelations@coogee.com.au |

### Emergency telephone number

| | |
|---|---|
| **Association / Organisation** | Coogee Chemicals |
| **Emergency telephone numbers** | 1800 800 655 |
| **Other emergency telephone numbers** | Not Available |

## SECTION 2 HAZARDS IDENTIFICATION

### Classification of the substance or mixture

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

| | |
|---|---|
| **Poisons Schedule** | S6 |
| **Classification [1]** | Metal Corrosion Category 1, Skin Corrosion/Irritation Category 1A, Serious Eye Damage Category 1 |
| ***Legend:*** | *1. Classified by Chemwatch; 2. Classification drawn from HSIS ; 3. Classification drawn from EC Directive 1272/2008 - Annex VI* |

### Label elements

| | |
|---|---|
| **GHS label elements** |  |
| SIGNAL WORD | **DANGER** |

### Hazard statement(s)

| | |
|---|---|
| **H290** | May be corrosive to metals. |
| **H314** | Causes severe skin burns and eye damage. |

### Supplementary statement(s)

Not Applicable

### Precautionary statement(s) Prevention

| | |
|---|---|
| **P260** | Do not breathe dust/fume/gas/mist/vapours/spray. |
| **P280** | Wear protective gloves/protective clothing/eye protection/face protection. |

### Precautionary statement(s) Response

| | |
|---|---|
| **P301+P330+P331** | IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. |

Continued...

| | |
|---|---|
| **P303+P361+P353** | IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. |

### Precautionary statement(s) Storage

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

### Precautionary statement(s) Disposal

| | |
|---|---|
| **P501** | Dispose of contents/container in accordance with local regulations. |

## SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

### Substances

See section below for composition of Mixtures

### Mixtures

| CAS No | %[weight] | Name |
|---|---|---|
| 1310-73-2 | 50 | sodium hydroxide |
| 7732-18-5 | 50 | water |

## SECTION 4 FIRST AID MEASURES

### Description of first aid measures

| | |
|---|---|
| **Eye Contact** | If this product comes in contact with the eyes:<br>▸ Immediately hold eyelids apart and flush the eye continuously with running water.<br>▸ 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.<br>▸ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.<br>▸ Transport to hospital or doctor without delay.<br>▸ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel. |
| **Skin Contact** | If skin or hair contact occurs:<br>▸ Immediately flush body and clothes with large amounts of water, using safety shower if available.<br>▸ Quickly remove all contaminated clothing, including footwear.<br>▸ Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.<br>▸ Transport to hospital, or doctor. |
| **Inhalation** | ▸ If fumes or combustion products are inhaled remove from contaminated area.<br>▸ Lay patient down. Keep warm and rested.<br>▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.<br>▸ 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.<br>▸ Transport to hospital, or doctor.<br>▸ Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.<br>▸ Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).<br>▸ 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.<br>▸ Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered.<br>**This must definitely be left to a doctor or person authorised by him/her.**<br>(ICSC13719) |
| **Ingestion** | ▸ For advice, contact a Poisons Information Centre or a doctor at once.<br>▸ Urgent hospital treatment is likely to be needed.<br>▸ If swallowed do **NOT** induce vomiting.<br>▸ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.<br>▸ Observe the patient carefully.<br>▸ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.<br>▸ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.<br>▸ Transport to hospital or doctor without delay. |

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

**Continued...**

For acute or short-term repeated exposures to highly alkaline materials:

- Respiratory stress is uncommon but present occasionally because of soft tissue edema.
- Unless endotracheal intubation can be accomplished under direct vision, cricothyroidotomy or tracheotomy may be necessary.
- Oxygen is given as indicated.
- The presence of shock suggests perforation and mandates an intravenous line and fluid administration.
- Damage due to alkaline corrosives occurs by liquefaction necrosis whereby the saponification of fats and solubilisation of proteins allow deep penetration into the tissue.

Alkalis continue to cause damage after exposure.

INGESTION:

- Milk and water are the preferred diluents

No more than 2 glasses of water should be given to an adult.

- Neutralising agents should never be given since exothermic heat reaction may compound injury.

* Catharsis and emesis are absolutely contra-indicated.
* Activated charcoal does not absorb alkali.
* Gastric lavage should not be used.

Supportive care involves the following:

- Withhold oral feedings initially.
- If endoscopy confirms transmucosal injury start steroids only within the first 48 hours.
- Carefully evaluate the amount of tissue necrosis before assessing the need for surgical intervention.
- Patients should be instructed to seek medical attention whenever they develop difficulty in swallowing (dysphagia).

SKIN AND EYE:

- Injury should be irrigated for 20-30 minutes.

Eye injuries require saline. [Ellenhorn & Barceloux: Medical Toxicology]

## SECTION 5 FIREFIGHTING MEASURES

### Extinguishing media

- Water spray or fog.
- Foam.

### 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. |
| **Fire/Explosion Hazard** | ▸ Non combustible.<br>▸ Not considered a significant fire risk, however containers may burn.<br>May emit corrosive fumes. |
| **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>▸ Avoid breathing vapours and contact with skin and eyes. |
| **Major Spills** | ▸ Clear area of personnel and move upwind.<br>▸ Alert Fire Brigade and tell them location and nature of hazard. |

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

## SECTION 7 HANDLING AND STORAGE

### Precautions for safe handling

| | |
|---|---|
| **Safe handling** | ▸ Avoid all personal contact, including inhalation.<br>▸ Wear protective clothing when risk of exposure occurs.<br>▸ **DO NOT** allow clothing wet with material to stay in contact with skin |
| **Other information** | ▸ Store in original containers.<br>▸ Keep containers securely sealed.<br>▸ **DO NOT** store near acids, or oxidising agents<br>▸ No smoking, naked lights, heat or ignition sources. |

### Conditions for safe storage, including any incompatibilities

| | |
|---|---|
| **Suitable container** | ▸ **DO NOT** use aluminium, galvanised or tin-plated containers<br>▸ Lined metal can, lined metal pail/ can.<br>▸ Plastic pail.<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. |

**Continued...**

| | |
|---|---|
| **Storage incompatibility** | ▸ Avoid strong acids, acid chlorides, acid anhydrides and chloroformates.<br>▸ Avoid contact with copper, aluminium and their alloys. |

\+ X + O + + +

**X** — Must not be stored together
**0** — May be stored together with specific preventions
**+** — May be stored together

## 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 | sodium hydroxide | Sodium hydroxide | Not Available | Not Available | 2 mg/m3 | Not Available |

**EMERGENCY LIMITS**

| Ingredient | Material name | TEEL-1 | TEEL-2 | TEEL-3 |
|---|---|---|---|---|
| sodium hydroxide | Sodium hydroxide | Not Available | Not Available | Not Available |

| Ingredient | Original IDLH | Revised IDLH |
|---|---|---|
| sodium hydroxide | 250 mg/m3 | 10 mg/m3 |
| water | Not Available | Not Available |

**MATERIAL DATA**

### 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. |
| **Personal protection** |  |
| **Eye and face protection** | ▸ 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.<br>▸ Chemical goggles.whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted. |
| **Skin protection** | See Hand protection below |
| **Hands/feet protection** | ▸ Elbow length PVC gloves<br>▸ When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.<br>The selection of 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. |
| **Body protection** | See Other protection below |
| **Other protection** | ▸ Overalls.<br>▸ PVC Apron. |
| **Thermal hazards** | Not Available |

### Respiratory protection

Particulate. (AS/NZS 1716 & 1715, EN 143:000 & 149:001, ANSI Z88 or national equivalent)

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

| | |
|---|---|
| **Appearance** | Clear highly alkaline liquid with slight odour; mixes with water. |

| | | | |
|---|---|---|---|
| **Physical state** | Liquid | **Relative density (Water = 1)** | 1.52 |
| **Odour** | Not Available | **Partition coefficient n-octanol / water** | Not Available |
| **Odour threshold** | Not Available | **Auto-ignition temperature (°C)** | Not Applicable |
| **pH (as supplied)** | 14 | **Decomposition temperature** | Not Available |
| **Melting point / freezing point (°C)** | 12 | **Viscosity (cSt)** | Not Available |

**Continued...**

| | | | |
|---|---|---|---|
| **Initial boiling point and boiling range (°C)** | 142 | **Molecular weight (g/mol)** | Not Applicable |
| **Flash point (°C)** | Not Applicable | **Taste** | Not Available |
| **Evaporation rate** | Not Available | **Explosive properties** | Not Available |
| **Flammability** | Not Applicable | **Oxidising properties** | Not Available |
| **Upper Explosive Limit (%)** | Not Applicable | **Surface Tension (dyn/cm or mN/m)** | Not Available |
| **Lower Explosive Limit (%)** | Not Applicable | **Volatile Component (%vol)** | 50 (%wt) |
| **Vapour pressure (kPa)** | Not Available | **Gas group** | Not Available |
| **Solubility in water (g/L)** | Miscible | **pH as a solution (1%)** | Not Available |
| **Vapour density (Air = 1)** | Not Available | **VOC g/L** | Not Applicable |

## SECTION 10 STABILITY AND REACTIVITY

| | |
|---|---|
| **Reactivity** | See section 7 |
| **Chemical stability** | ▸ Unstable in the presence of incompatible materials.<br>▸ Product is considered stable. |
| **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** | Inhalation of alkaline corrosives may produce irritation of the respiratory tract with coughing, choking, pain and mucous membrane damage. Pulmonary oedema may develop in more severe cases; this may be immediate or in most cases following a latent period of 5-72 hours.<br>Severe acute sodium hydroxide dust inhalation exposure may be fatal due to spasm, inflammation and oedema of the larynx and bronchi, chemical pneumonitis and severe pulmonary oedema.<br>Symptoms of overexposure include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting. |
| **Ingestion** | Ingestion of alkaline corrosives may produce immediate pain, and circumoral burns. Mucous membrane corrosive damage is characterised by a white appearance and soapy feel; this may then become brown, oedematous and ulcerated.<br>Ingestion of sodium hydroxide may result in severe burns to the mouth, throat and stomach, pain, nausea and vomiting, swelling of the larynx and subsequent suffocation, perforation of the gastro-intestinal tract.<br>A 1% aqueous solution (pH 13.4)of sodium hydroxide  failed to cause gastric, oesophageal or other damage in rabbits. |
| **Skin Contact** | The material can produce severe chemical burns following direct contact with the skin.<br>Sodium hydroxide burns are not immediately painful; onset of pain may be delayed minutes or hours; thus care should be taken to avoid contamination of gloves and boots.<br>A 5% aqueous solution of sodium hydroxide applied to the skin of rabbits for 4 hours produced severe necrosis.<br>Skin contact with alkaline corrosives may produce severe pain and burns; brownish stains may develop. The corroded area may be soft, gelatinous and necrotic; tissue destruction may be deep.<br>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. |
| **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>Direct contact with alkaline corrosives may produce pain and burns. Oedema, destruction of the epithelium, corneal opacification and iritis may occur. |
| **Chronic** | Repeated or prolonged exposure to corrosives 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.<br>Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. |

| | TOXICITY | IRRITATION |
|---|---|---|
| **Coogee Chemicals Caustic Soda 50%** | Not Available | Not Available |
| **sodium hydroxide** | Oral (rabbit) LD50: 325 mg/kg[1] | Eye (rabbit): 0.05 mg/24h SEVERE |
| | | Eye (rabbit):1 mg/24h SEVERE |
| | | Eye (rabbit):1 mg/30s rinsed-SEVERE |
| | | Skin (rabbit): 500 mg/24h SEVERE |
| **water** | Oral (rat) LD50: >90000 mg/kg[2] | Not Available |

| | |
|---|---|
| ***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* |

| | |
|---|---|
| **SODIUM HYDROXIDE** | The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce |

**Continued...**

| | |
|---|---|
| | conjunctivitis.<br>The material may produce severe skin irritation after prolonged or repeated exposure, and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) thickening of the epidermis.<br><br>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. |
| **WATER** | 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 available but does not fill the criteria for classification*
✓ *– Data available to make classification*
⊘ *– Data Not Available to make classification*

## SECTION 12 ECOLOGICAL INFORMATION

### Toxicity

| Ingredient | Endpoint | Test Duration (hr) | Species | Value | Source |
|---|---|---|---|---|---|
| **sodium hydroxide** | LC50 | 96 | Fish | 4.16158mg/L | 3 |
| **sodium hydroxide** | EC50 | 96 | Algae or other aquatic plants | 1034.10043mg/L | 3 |
| **sodium hydroxide** | EC50 | 384 | Crustacea | 27901.643mg/L | 3 |
| **sodium hydroxide** | NOEC | 96 | Fish | 56mg/L | 4 |
| ***Legend:*** | *Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 - 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* | | | | |

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 |
|---|---|---|
| sodium hydroxide | LOW | LOW |
| water | LOW | LOW |

### Bioaccumulative potential

| Ingredient | Bioaccumulation |
|---|---|
| sodium hydroxide | LOW (LogKOW = -3.8796) |
| water | LOW (LogKOW = -1.38) |

### Mobility in soil

| Ingredient | Mobility |
|---|---|
| sodium hydroxide | LOW (KOC = 14.3) |
| water | LOW (KOC = 14.3) |

## SECTION 13 DISPOSAL CONSIDERATIONS

### Waste treatment methods

| | |
|---|---|
| **Product / Packaging disposal** | ▸ Containers may still present a chemical hazard/ danger when empty.<br>▸ Return to supplier for reuse/ recycling if possible. |

## SECTION 14 TRANSPORT INFORMATION

### Labels Required

| | |
|---|---|
| |  |
| **Marine Pollutant** | NO |
| **HAZCHEM** | 2R |

### Land transport (ADG)

**Continued...**

| | |
|---|---|
| **UN number** | 1824 |
| **UN proper shipping name** | SODIUM HYDROXIDE SOLUTION |
| **Transport hazard class(es)** | Class: 8<br>Subrisk: Not Applicable |
| **Packing group** | II |
| **Environmental hazard** | Not Applicable |
| **Special precautions for user** | Special provisions: Not Applicable<br>Limited quantity: 1 L |

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

| | |
|---|---|
| **UN number** | 1824 |
| **UN proper shipping name** | Sodium hydroxide solution |
| **Transport hazard class(es)** | ICAO/IATA Class: 8<br>ICAO / IATA Subrisk: Not Applicable<br>ERG Code: 8L |
| **Packing group** | II |
| **Environmental hazard** | Not Applicable |
| **Special precautions for user** | Special provisions: A3A803<br>Cargo Only Packing Instructions: 855<br>Cargo Only Maximum Qty / Pack: 30 L<br>Passenger and Cargo Packing Instructions: 851<br>Passenger and Cargo Maximum Qty / Pack: 1 L<br>Passenger and Cargo Limited Quantity Packing Instructions: Y840<br>Passenger and Cargo Limited Maximum Qty / Pack: 0.5 L |

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

| | |
|---|---|
| **UN number** | 1824 |
| **UN proper shipping name** | SODIUM HYDROXIDE SOLUTION |
| **Transport hazard class(es)** | IMDG Class: 8<br>IMDG Subrisk: Not Applicable |
| **Packing group** | II |
| **Environmental hazard** | Not Applicable |
| **Special precautions for user** | EMS Number: F-A, S-B<br>Special provisions: Not Applicable<br>Limited Quantities: 1 L |

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

Not Applicable

## SECTION 15 REGULATORY INFORMATION

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

**SODIUM HYDROXIDE(1310-73-2) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

Australia Exposure Standards

Australia Inventory of Chemical Substances (AICS)

Australia Hazardous Substances Information System - Consolidated Lists

**WATER(7732-18-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

Australia Inventory of Chemical Substances (AICS)

| National Inventory | Status |
|---|---|
| Australia - AICS | Y |
| Canada - DSL | Y |
| Canada - NDSL | N (water; sodium hydroxide) |
| China - IECSC | Y |
| Europe - EINEC / ELINCS / NLP | Y |
| Japan - ENCS | N (water) |
| Korea - KECI | Y |

Continued...

| | |
|---|---|
| New Zealand - NZIoC | Y |
| Philippines - PICCS | Y |
| USA - TSCA | Y |
| ***Legend:*** | *Y = All ingredients are on the inventory*<br>*N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)* |

## SECTION 16 OTHER INFORMATION

### Other information

### Ingredients with multiple cas numbers

| Name | CAS No |
|---|---|
| sodium hydroxide | 1310-73-2, 12200-64-5 |

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.

### 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
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

# Coogee Chemicals Sulphuric Acid

## Coogee Chemicals Pty Ltd

Chemwatch Hazard Alert Code: **4**

Chemwatch: **48-4494**
Version No: **3.1.1.1**
Safety Data Sheet according to WHS and ADG requirements

Issue Date: **13/12/2016**
Print Date: **16/02/2017**
L.GHS.AUS.EN

## SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

### Product Identifier

| | |
|---|---|
| **Product name** | Coogee Chemicals Sulphuric Acid |
| **Proper shipping name** | SULPHURIC ACID with more than 51% acid |
| **Other means of identification** | Not Available |

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

| | |
|---|---|
| **Relevant identified uses** | Battery Acid, Explosive Manufacture, Fertilizer. |

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

| | |
|---|---|
| **Registered company name** | Coogee Chemicals Pty Ltd |
| **Address** | Cnr of Patterson and Kwinana Beach Roads Kwinana WA Australia |
| **Telephone** | +61 8 9439 8200 |
| **Fax** | +61 8 9439 8300 |
| **Website** | www.coogee.com.au |
| **Email** | businessrelations@coogee.com.au |

### Emergency telephone number

| | |
|---|---|
| **Association / Organisation** | Coogee Chemicals |
| **Emergency telephone numbers** | 1800 800 655 |
| **Other emergency telephone numbers** | Not Available |

## SECTION 2 HAZARDS IDENTIFICATION

### Classification of the substance or mixture

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

| | |
|---|---|
| **Poisons Schedule** | S6 |
| **Classification [1]** | Metal Corrosion Category 1, Skin Corrosion/Irritation Category 1A, Serious Eye Damage Category 1 |
| ***Legend:*** | *1. Classified by Chemwatch; 2. Classification drawn from HSIS ; 3. Classification drawn from EC Directive 1272/2008 - Annex VI* |

### Label elements

| | |
|---|---|
| **GHS label elements** |  |
| SIGNAL WORD | **DANGER** |

### Hazard statement(s)

| | |
|---|---|
| **H290** | May be corrosive to metals. |
| **H314** | Causes severe skin burns and eye damage. |

### Supplementary statement(s)

Not Applicable

### Precautionary statement(s) Prevention

| | |
|---|---|
| **P260** | Do not breathe dust/fume/gas/mist/vapours/spray. |
| **P280** | Wear protective gloves/protective clothing/eye protection/face protection. |

### Precautionary statement(s) Response

| | |
|---|---|
| **P301+P330+P331** | IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. |

**Continued...**

| | |
|---|---|
| **P303+P361+P353** | IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. |

### Precautionary statement(s) Storage

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

### Precautionary statement(s) Disposal

| | |
|---|---|
| **P501** | Dispose of contents/container in accordance with local regulations. |

## SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

### Substances

See section below for composition of Mixtures

### Mixtures

| CAS No | %[weight] | Name |
|---|---|---|
| 7664-93-9 | 98 | sulfuric acid |
| 7732-18-5 | 2 | water |

## SECTION 4 FIRST AID MEASURES

### Description of first aid measures

| | |
|---|---|
| **Eye Contact** | If this product comes in contact with the eyes:<br>- Immediately hold eyelids apart and flush the eye continuously with running water.<br>- 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.<br>- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.<br>- Transport to hospital or doctor without delay.<br>- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel. |
| **Skin Contact** | If skin or hair contact occurs:<br>- Immediately flush body and clothes with large amounts of water, using safety shower if available.<br>- Quickly remove all contaminated clothing, including footwear.<br>- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.<br>- Transport to hospital, or doctor. |
| **Inhalation** | - If fumes or combustion products are inhaled remove from contaminated area.<br>- Lay patient down. Keep warm and rested.<br>- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.<br>- 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.<br>- Transport to hospital, or doctor.<br>- Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.<br>- Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).<br>- 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.<br>- Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered.<br>**This must definitely be left to a doctor or person authorised by him/her.**<br>(ICSC13719) |
| **Ingestion** | - For advice, contact a Poisons Information Centre or a doctor at once.<br>- Urgent hospital treatment is likely to be needed.<br>- If swallowed do **NOT** induce vomiting.<br>- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.<br>- Observe the patient carefully.<br>- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.<br>- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.<br>- Transport to hospital or doctor without delay. |

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

Continued...

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]

## SECTION 5 FIREFIGHTING MEASURES

### Extinguishing media

- Water spray or fog.
- Foam.

### Special hazards arising from the substrate or mixture

| | |
|---|---|
| **Fire Incompatibility** | Decomposes on heating and produces toxic fumes of:<br>,<br>sulfur oxides (SOx) |

### Advice for firefighters

| | |
|---|---|
| **Fire Fighting** | - Alert Fire Brigade and tell them location and nature of hazard.<br>- May be violently or explosively reactive. |
| **Fire/Explosion Hazard** | - Non combustible.<br>- Not considered to be a significant fire risk.<br>Decomposition may produce toxic fumes of:<br>,<br>sulfur oxides (SOx) |
| **HAZCHEM** | 2P |

## 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>- Avoid breathing vapours and contact with skin and eyes.<br>Slippery when spilt. |
| **Major Spills** | Slippery when spilt.<br>- Clear area of personnel and move upwind.<br>- Alert Fire Brigade and tell them location and nature of hazard. |

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

## SECTION 7 HANDLING AND STORAGE

### Precautions for safe handling

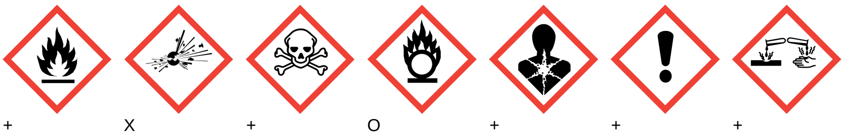
| | |
|---|---|
| **Safe handling** | - Avoid all personal contact, including inhalation.<br>- Wear protective clothing when risk of exposure occurs. |
| **Other information** | - Store in original containers.<br>- Keep containers securely sealed. |

### Conditions for safe storage, including any incompatibilities

| | |
|---|---|
| **Suitable container** | - **DO NOT** use aluminium or galvanised containers<br>- Lined metal can, lined metal pail/ can. |

**Continued...**

| | |
|---|---|
| | - Plastic pail.<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. |
| **Storage incompatibility** | - 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 |



**X** — Must not be stored together
**0** — May be stored together with specific preventions
**+** — May be stored together

## 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 | sulfuric acid | Sulphuric acid | 1 mg/m3 | 3 mg/m3 | Not Available | Not Available |

**EMERGENCY LIMITS**

| Ingredient | Material name | TEEL-1 | TEEL-2 | TEEL-3 |
|---|---|---|---|---|
| sulfuric acid | Sulfuric acid | Not Available | Not Available | Not Available |

| Ingredient | Original IDLH | Revised IDLH |
|---|---|---|
| sulfuric acid | 80 mg/m3 | 15 mg/m3 |
| water | Not Available | Not Available |

**MATERIAL DATA**

### 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. |
| **Personal protection** |  |
| **Eye and face protection** | - 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.<br>- Chemical goggles.whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted. |
| **Skin protection** | See Hand protection below |
| **Hands/feet protection** | - Elbow length PVC gloves<br>- When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots. |
| **Body protection** | See Other protection below |
| **Other protection** | - Overalls.<br>- PVC Apron. |
| **Thermal hazards** | Not Available |

### Respiratory protection

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

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

| | |
|---|---|
| **Appearance** | Clear brown colour acidic liquid with strong odour; miscible with water. |

| | | | |
|---|---|---|---|
| **Physical state** | Liquid | **Relative density (Water = 1)** | 1.8 |
| **Odour** | Not Available | **Partition coefficient n-octanol / water** | Not Available |
| **Odour threshold** | Not Available | **Auto-ignition temperature (°C)** | Not Available |
| **pH (as supplied)** | <1 | **Decomposition temperature** | Not Available |

**Continued...**

| | | | |
|---|---|---|---|
| **Melting point / freezing point (°C)** | 10 | **Viscosity (cSt)** | Not Available |
| **Initial boiling point and boiling range (°C)** | 335 | **Molecular weight (g/mol)** | Not Applicable |
| **Flash point (°C)** | Not Applicable | **Taste** | Not Available |
| **Evaporation rate** | Not Available | **Explosive properties** | Not Available |
| **Flammability** | Not Applicable | **Oxidising properties** | Not Available |
| **Upper Explosive Limit (%)** | Not Applicable | **Surface Tension (dyn/cm or mN/m)** | Not Available |
| **Lower Explosive Limit (%)** | Not Applicable | **Volatile Component (%vol)** | Not Available |
| **Vapour pressure (kPa)** | <0.001 | **Gas group** | Not Available |
| **Solubility in water (g/L)** | Miscible | **pH as a solution (1%)** | Not Available |
| **Vapour density (Air = 1)** | Not Available | **VOC g/L** | Not Available |

## SECTION 10 STABILITY AND REACTIVITY

| | |
|---|---|
| **Reactivity** | See section 7 |
| **Chemical stability** | ▸ 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.<br>Exposure to high concentrations causes bronchitis and is characterised by the onset of haemorrhagic pulmonary oedema. |
| **Ingestion** | Ingestion of acidic corrosives may produce circumoral burns with a distinct discolouration of the mucous membranes of the mouth, throat and oesophagus. Immediate pain and difficulties in swallowing and speaking may also be evident. |
| **Skin Contact** | 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.<br>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. |
| **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>Direct eye contact with acid corrosives may produce pain, lachrymation, photophobia and burns. Mild burns of the epithelia generally recover rapidly and completely. |
| **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.<br>Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. |

| | TOXICITY | IRRITATION |
|---|---|---|
| **Coogee Chemicals Sulphuric Acid** | Not Available | Not Available |
| | **TOXICITY** | **IRRITATION** |
| **sulfuric acid** | Inhalation (guinea pig) LC50: 0.018 mg/L/8hr[2] | Eye (rabbit): 1.38 mg SEVERE |
| | Inhalation (mouse) LC50: 0.32 mg/L/2hr[2] | Eye (rabbit): 5 mg/30sec SEVERE |
| | Inhalation (rat) LC50: 0.51 mg/L/2hr[2] | |
| | Oral (rat) LD50: 2140 mg/kg[2] | |
| | **TOXICITY** | **IRRITATION** |
| **water** | Oral (rat) LD50: >90000 mg/kg[2] | Not Available |

| | |
|---|---|
| ***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* |

| | |
|---|---|
| **SULFURIC ACID** | 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.<br>**WARNING:** For inhalation exposure ONLY: This substance has been classified by the IARC as Group 1: **CARCINOGENIC TO HUMANS**<br>Occupational exposures to strong inorganic acid mists of sulfuric acid: |
| **WATER** | No significant acute toxicological data identified in literature search. |

**Continued...**

| | | | |
|---|---|---|---|
| **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 available but does not fill the criteria for classification*
✓ *– Data available to make classification*
⊘ *– Data Not Available to make classification*

## SECTION 12 ECOLOGICAL INFORMATION

### Toxicity

| Ingredient | Endpoint | Test Duration (hr) | Species | Value | Source |
|---|---|---|---|---|---|
| **sulfuric acid** | LC50 | 96 | Fish | =8mg/L | 1 |
| **sulfuric acid** | EC50 | 48 | Crustacea | =42.5mg/L | 1 |
| **sulfuric acid** | EC50 | 240 | Algae or other aquatic plants | 2.5000mg/L | 4 |
| **sulfuric acid** | NOEC | 7200 | Fish | 0.13mg/L | 2 |
| ***Legend:*** | *Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 - 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* | | | | |

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 |
|---|---|---|
| water | LOW | LOW |

### Bioaccumulative potential

| Ingredient | Bioaccumulation |
|---|---|
| water | LOW (LogKOW = -1.38) |

### Mobility in soil

| Ingredient | Mobility |
|---|---|
| water | LOW (KOC = 14.3) |

## SECTION 13 DISPOSAL CONSIDERATIONS

### Waste treatment methods

| | |
|---|---|
| **Product / Packaging disposal** | ▸ Recycle wherever possible.<br>▸ 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. |

## SECTION 14 TRANSPORT INFORMATION

### Labels Required

| | |
|---|---|
| **Marine Pollutant** | NO |
| **HAZCHEM** | 2P |

### Land transport (ADG)

| | |
|---|---|
| **UN number** | 1830 |
| **UN proper shipping name** | SULPHURIC ACID with more than 51% acid |
| **Transport hazard class(es)** | Class 8<br>Subrisk Not Applicable |
| **Packing group** | II |
| **Environmental hazard** | Not Applicable |

**Continued...**

| | |
|---|---|
| **Special precautions for user** | Special provisions: Not Applicable<br>Limited quantity: 1 L |

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

| | |
|---|---|
| **UN number** | 1830 |
| **UN proper shipping name** | Sulphuric acid with more than 51% acid |
| **Transport hazard class(es)** | ICAO/IATA Class: 8<br>ICAO / IATA Subrisk: Not Applicable<br>ERG Code: 8L |
| **Packing group** | II |
| **Environmental hazard** | Not Applicable |
| **Special precautions for user** | Special provisions: Not Applicable<br>Cargo Only Packing Instructions: 855<br>Cargo Only Maximum Qty / Pack: 30 L<br>Passenger and Cargo Packing Instructions: 851<br>Passenger and Cargo Maximum Qty / Pack: 1 L<br>Passenger and Cargo Limited Quantity Packing Instructions: Y840<br>Passenger and Cargo Limited Maximum Qty / Pack: 0.5 L |

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

| | |
|---|---|
| **UN number** | 1830 |
| **UN proper shipping name** | SULPHURIC ACID with more than 51% acid |
| **Transport hazard class(es)** | IMDG Class: 8<br>IMDG Subrisk: Not Applicable |
| **Packing group** | II |
| **Environmental hazard** | Not Applicable |
| **Special precautions for user** | EMS Number: F-A, S-B<br>Special provisions: Not Applicable<br>Limited Quantities: 1 L |

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

| Source | Product name | Pollution Category | Ship Type |
|---|---|---|---|
| IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk | Sulphuric acid | Y | 3 |

## SECTION 15 REGULATORY INFORMATION

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

**SULFURIC ACID(7664-93-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

- Australia Exposure Standards
- Australia Hazardous Substances Information System - Consolidated Lists
- Australia Inventory of Chemical Substances (AICS)
- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
- International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft

**WATER(7732-18-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

- Australia Inventory of Chemical Substances (AICS)

| National Inventory | Status |
|---|---|
| Australia - AICS | Y |
| Canada - DSL | Y |
| Canada - NDSL | N (water; sulfuric acid) |
| China - IECSC | Y |
| Europe - EINEC / ELINCS / NLP | Y |
| Japan - ENCS | N (water) |
| Korea - KECI | Y |
| New Zealand - NZIoC | Y |
| Philippines - PICCS | Y |
| USA - TSCA | Y |

**Continued...**

| | |
|---|---|
| ***Legend:*** | *Y = All ingredients are on the inventory*<br>*N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)* |

## SECTION 16 OTHER INFORMATION

### 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.

### 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
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

# SAFETY DATA SHEET

**# 030**

## 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

### 1.1 Product identifier

| | |
|---|---|
| **Product name** | **CARBON DIOXIDE CYLINDER, GAS AND LIQUID WITHDRAWAL** |
| **Synonym(s)** | 030 - SDS NUMBER ● 206, 207, 261 ● CARBON DIOXIDE, COMPRESSED ● FOGG GAS ● PRODUCT CODES: 080, 081, 082, 083, 084, 086, 131, 176, 200 ● REFRIGERANT 744 |

### 1.2 Uses and uses advised against

| | |
|---|---|
| **Use(s)** | DISPENSING GAS ● INERT GAS ● SHIELDING GAS |

### 1.3 Details of the supplier of the product

| | |
|---|---|
| **Supplier name** | **BOC LIMITED (AUSTRALIA)** |
| **Address** | 10 Julius Avenue, North Ryde, NSW, 2113, AUSTRALIA |
| **Telephone** | 131 262, (02) 8874 4400 |
| **Fax** | 132 427 (24 hours) |
| **Website** | http://www.boc.com.au |

### 1.4 Emergency telephone number(s)

| | |
|---|---|
| **Emergency** | 1800 653 572 (24/7) (Australia only) |

## 2. HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS (GHS ONLY) ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

| | |
|---|---|
| **GHS classification(s)** | Gases Under Pressure: Liquefied gas |

### 2.2 Label elements

| | |
|---|---|
| **Signal word** | **WARNING** |

**Pictogram(s)**

**Hazard statement(s)**

| | |
|---|---|
| H280 | Contains gas under pressure; may explode if heated. |

**Prevention statement(s)**

None allocated.

**Response statement(s)**

None allocated.

**Storage statement(s)**

| | |
|---|---|
| P410 + P403 | Protect from sunlight. Store in a well-ventilated place. |

**Disposal statement(s)**

None allocated.

### 2.3 Other hazards

Asphyxiant. Effects are proportional to oxygen displacement.

## 3. COMPOSITION/ INFORMATION ON INGREDIENTS

### 3.1 Substances / Mixtures

| Ingredient | CAS Number | EC Number | Content (v/v) |
|---|---|---|---|
| CARBON DIOXIDE | 124-38-9 | 204-696-9 | >99.9% |

## 4. FIRST AID MEASURES

### 4.1 Description of first aid measures

| | |
|---|---|
| **Eye** | Cold burns: Immediately flush with tepid water or with sterile saline solution. Hold eyelids apart and irrigate for 15 minutes. Seek medical attention. |
| **Inhalation** | If inhaled, remove from contaminated area. To protect rescuer, use an Air-line respirator or Self Contained Breathing Apparatus (SCBA). Apply artificial respiration if not breathing. Give oxygen if available. For advice, contact a Poisons Information Centre on 13 11 26 (Australia Wide) or a doctor. |
| **Skin** | Cold burns: Remove contaminated clothing and gently flush affected areas with warm water (30°C) for 15 minutes. Apply sterile dressing and treat as for a thermal burn. For large burns, immerse in warm water for 15 minutes. DO NOT apply any form of direct heat. Seek immediate medical attention. |
| **Ingestion** | Due to product form and application, ingestion is considered unlikely. |
| **First aid facilities** | None allocated. |

### 4.2 Most important symptoms and effects, both acute and delayed

In high concentrations may cause asphyxiation. Direct contact with the liquefied material or escaping compressed gas may cause frostbite injury. Low concentrations of $CO2$ cause increased respiration and headache.

### 4.3 Immediate medical attention and special treatment needed

Treat for asphyxia and cold burns.

## 5. FIRE FIGHTING MEASURES

### 5.1 Extinguishing media

Use water fog to cool containers from protected area.

### 5.2 Special hazards arising from the substance or mixture

Non flammable.

### 5.3 Advice for firefighters

Temperatures in a fire may cause liquid vessels and related equipment to rupture. Storage vessels may contain fine particle insulation materials or foam products which may be hazardous or release hazardous decomposition products in a fire. Cool vessels exposed to fire by applying water from a protected location. Do not approach vessels suspected of being hot. Evacuate area if unable to keep vessels cool.

### 5.4 Hazchem code

2T

| | |
|---|---|
| 2 | Fine Water Spray. |
| T | Wear full fire kit and breathing apparatus. Dilute spill and run-off. |

## 6. ACCIDENTAL RELEASE MEASURES

### 6.1 Personal precautions, protective equipment and emergency procedures

If the cylinder is leaking, evacuate area of personnel. Inform manufacturer/supplier of leak. Use Personal Protective Equipment (PPE) as detailed in Section 8 of the SDS. Ventilate area where possible and eliminate ignition sources.

### 6.2 Environmental precautions

Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

### 6.3 Methods of cleaning up

Stop the flow of material, if this is without risk. If the leak is irreparable, move the cylinder to a safe and well ventilated area, and allow to discharge. Keep area evacuated and free from ignition sources until any leaked or spilled liquid has evaporated.

### 6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

# 7. HANDLING AND STORAGE

## 7.1 Precautions for safe handling

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

## 7.2 Conditions for safe storage, including any incompatibilities

Refer to vessel operating instructions. Do not store near incompatible substances, heat or ignition sources and foodstuffs. Portable liquid containers should be stored: upright, prevented from falling, in a secure area; below 45°C, in a dry, well ventilated area constructed of non-combustible material with firm level floor (preferably concrete), away from areas of heavy traffic and emergency exits.

## 7.3 Specific end use(s)

No information provided.

# 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

## 8.1 Control parameters

**Exposure standards**

| Ingredient | Reference | TWA | | STEL | |
|---|---|---|---|---|---|
| | | ppm | mg/m³ | ppm | mg/m³ |
| Carbon dioxide | SWA (AUS) | 5000 | 9000 | 30000 | 54000 |
| Carbon dioxide in coal mines | SWA (AUS) | 12500 | 22500 | 30000 | 54000 |

**Biological limits**

No biological limit values have been entered for this product.

## 8.2 Exposure controls

**Engineering controls** Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain vapour levels below the recommended exposure standard.

**PPE**

| | |
|---|---|
| **Eye / Face** | Wear safety glasses. |
| **Hands** | Wear leather or insulated gloves. |
| **Body** | Wear coveralls. |
| **Respiratory** | Where an inhalation risk exists, wear Self Contained Breathing Apparatus (SCBA) or an Air-line respirator. |

# 9. PHYSICAL AND CHEMICAL PROPERTIES

## 9.1 Information on basic physical and chemical properties

| | |
|---|---|
| **Appearance** | COLOURLESS GAS |
| **Odour** | ODOURLESS |
| **Flammability** | NON FLAMMABLE |
| **Flash point** | NOT RELEVANT |
| **Boiling point** | NOT AVAILABLE |
| **Melting point** | NOT AVAILABLE |
| **Evaporation rate** | NOT APPLICABLE |
| **pH** | NOT APPLICABLE |
| **Vapour density** | NOT AVAILABLE |
| **Specific gravity** | NOT APPLICABLE |
| **Solubility (water)** | 0.759 cm³/cm³ |
| **Vapour pressure** | 6300 kPa @ 25°C (Approximately) |
| **Upper explosion limit** | NOT RELEVANT |
| **Lower explosion limit** | NOT RELEVANT |
| **Partition coefficient** | NOT AVAILABLE |

### 9.1 Information on basic physical and chemical properties

| | |
|---|---|
| **Autoignition temperature** | NOT AVAILABLE |
| **Decomposition temperature** | NOT AVAILABLE |
| **Viscosity** | NOT AVAILABLE |
| **Explosive properties** | NOT AVAILABLE |
| **Oxidising properties** | NOT AVAILABLE |
| **Odour threshold** | NOT AVAILABLE |

### 9.2 Other information

| | |
|---|---|
| **% Volatiles** | 100 % |
| **Critical pressure** | 7,380 kPa (Approximately) |
| **Critical temperature** | 31°C (Approximately) |
| **Cylinder pressure (when full)** | 6300 kPa @ 25°C (Approximately) |
| **Density** | 1.53 (Air = 1) |
| **Sublimation temperature** | -78°C (Approximately) |

## 10. STABILITY AND REACTIVITY

### 10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

### 10.2 Chemical stability

Stable under recommended conditions of storage.

### 10.3 Possibility of hazardous reactions

Polymerization will not occur.

### 10.4 Conditions to avoid

Avoid contact with incompatible substances.

### 10.5 Incompatible materials

Moist carbon dioxide is corrosive, hence acid resistant materials are required (e.g. stainless steel). Certain properties of some plastics and rubbers may be affected by carbon dioxide (i.e. embrittlement, leaching of plasticisers, etc).

### 10.6 Hazardous decomposition products

May evolve toxic gases if heated to decomposition.

## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

**Acute toxicity** Based on available data, the classification criteria are not met. Low concentrations of carbon dioxide cause increased respiration and headache.

**Information available for the ingredient(s):**

| Ingredient | Oral Toxicity (LD50) | Dermal Toxicity (LD50) | Inhalation Toxicity (LC50) |
|---|---|---|---|
| CARBON DIOXIDE | -- | -- | 470000 ppm/30M (rat) |

| | |
|---|---|
| **Skin** | Not classified as a skin irritant. Contact with dry ice powder may cause frostbite injury or cold burns. |
| **Eye** | Not classified as an eye irritant. Contact with dry ice powder may cause frostbite injury or cold burns. |
| **Sensitisation** | Not classified as causing skin or respiratory sensitisation. |
| **Mutagenicity** | Not classified as a mutagen. |
| **Carcinogenicity** | Not classified as a carcinogen. |
| **Reproductive** | Not classified as a reproductive toxin. |
| **STOT – single exposure** | Asphyxiant. Effects are proportional to oxygen displacement. Over exposure may result in dizziness, drowsiness, weakness, fatigue, breathing difficulties and unconsciousness. |
| **STOT - repeated exposure** | Not classified as causing organ damage from repeated exposure. |
| **Aspiration** | Not classified as causing aspiration. |

## 12. ECOLOGICAL INFORMATION

### 12.1 Toxicity

No information provided.

### 12.2 Persistence and degradability

No information provided.

### 12.3 Bioaccumulative potential

No information provided.

### 12.4 Mobility in soil

No information provided.

### 12.5 Other adverse effects

When discharged to the atmosphere, carbon dioxide may contribute to the greenhouse effect.

## 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

| | |
|---|---|
| **Waste disposal** | Ensure all liquid and gas supply valves are shut. Notify the manufacturer that you will be returning the portable liquid container. Residual product will be disposed of under the manufacturer's supervision. |
| **Legislation** | Dispose of in accordance with relevant local legislation. |

## 14. TRANSPORT INFORMATION

**CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE**

| | LAND TRANSPORT (ADG) | SEA TRANSPORT (IMDG / IMO) | AIR TRANSPORT (IATA / ICAO) |
|---|---|---|---|
| **14.1 UN Number** | 1013 | 1013 | 1013 |
| **14.2 Proper Shipping Name** | CARBON DIOXIDE | CARBON DIOXIDE | CARBON DIOXIDE |
| **14.3 Transport hazard class** | 2.2 | 2.2 | 2.2 |
| **14.4 Packing Group** | None allocated. | None allocated. | None allocated. |

### 14.5 Environmental hazards

No information provided.

### 14.6 Special precautions for user

| | |
|---|---|
| **Hazchem code** | 2T |
| **GTEPG** | 2C1 |
| **EMS** | F-C, S-V |
| **Other information** | Transport on open top vehicles in accordance with Australian Code for the Transport of Dangerous Goods. Refer to Commonwealth, State and Territory Dangerous Goods Legislation which contain requirements which affect gas storage and transport. |

## 15. REGULATORY INFORMATION

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

| | |
|---|---|
| **Poison schedule** | A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP). |

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

**Hazard codes** None allocated.

**Risk phrases** None allocated.

**Safety phrases** None allocated.

**Inventory listing(s)** **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
All components are listed on AICS, or are exempt.

## 16. OTHER INFORMATION

**Additional information** The storage of significant quantities of gas cylinders must comply with AS4332 The storage and handling of gases in cylinders.

APPLICATION METHOD: Gas withdrawal: Gas regulator of suitable pressure and flow rating fitted to cylinder or manifold with low pressure gas distribution to equipment. Liquid withdrawal: may be used as liquid or vapourised for pressure regulated gas distribution.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE:
It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

**Abbreviations**

| | |
|---|---|
| ACGIH | American Conference of Governmental Industrial Hygienists |
| CAS # | Chemical Abstract Service number - used to uniquely identify chemical compounds |
| CNS | Central Nervous System |
| EC No. | EC No - European Community Number |
| EMS | Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods) |
| GHS | Globally Harmonized System |
| GTEPG | Group Text Emergency Procedure Guide |
| IARC | International Agency for Research on Cancer |
| LC50 | Lethal Concentration, 50% / Median Lethal Concentration |
| LD50 | Lethal Dose, 50% / Median Lethal Dose |
| $mg/m^3$ | Milligrams per Cubic Metre |
| OEL | Occupational Exposure Limit |
| pH | relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline). |
| ppm | Parts Per Million |
| STEL | Short-Term Exposure Limit |
| STOT-RE | Specific target organ toxicity (repeated exposure) |
| STOT-SE | Specific target organ toxicity (single exposure) |
| SUSMP | Standard for the Uniform Scheduling of Medicines and Poisons |
| SWA | Safe Work Australia |
| TLV | Threshold Limit Value |
| TWA | Time Weighted Average |

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

**Prepared by**

Risk Management Technologies
5 Ventnor Ave, West Perth
Western Australia 6005
Phone: +61 8 9322 1711
Fax: +61 8 9322 1794
Email: info@rmt.com.au
Web: www.rmt.com.au.

**[ End of SDS ]**

# PHOSPHORIC ACID

**Telford Industries**

Chemwatch Hazard Alert Code: **3**

Chemwatch: **1805**
Version No: **11.1.1.1**
Safety Data Sheet according to WHS and ADG requirements

Issue Date: **01/01/2013**
Print Date: **15/12/2016**
L.GHS.AUS.EN

## SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

### Product Identifier

| | |
|---|---|
| **Product name** | PHOSPHORIC ACID |
| **Chemical Name** | phosphoric acid |
| **Synonyms** | 76583, H3-P-04, orthophosphoric acid, phosphoric acid hemihydrate CAS RN 16271-20-8, trihydroxidooxidophosphorus |
| **Proper shipping name** | PHOSPHORIC ACID, SOLUTION |
| **Chemical formula** | H3PO4 |
| **Other means of identification** | Not Available |
| **CAS number** | 7664-38-2 |

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

| | |
|---|---|
| **Relevant identified uses** | Manufacture of superphosphate fertilisers, phosphate salts, detergents. Used as an acid catalyst in making ethylene and purifying hydrogen peroxide. Used in dental cement, process engraving and as an analytical agent. In food and soft drinks for sharp taste, tang as Food Additive 338. [~Intermediate ~] |

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

| | |
|---|---|
| **Registered company name** | Telford Industries |
| **Address** | 7 Valentine Street Kewdale WA 6105 Australia |
| **Telephone** | +61 8 9353 2053\|1 800 835 115 |
| **Fax** | +61 8 9 353 2054 |
| **Website** | https://www.telfordindustries.com.au/ |
| **Email** | info@telfordindustries.com.au |

### Emergency telephone number

| | |
|---|---|
| **Association / Organisation** | Not Available |
| **Emergency telephone numbers** | 1 800 774 557 |
| **Other emergency telephone numbers** | 1 800 SPILLS |

## SECTION 2 HAZARDS IDENTIFICATION

### Classification of the substance or mixture

| | |
|---|---|
| **Poisons Schedule** | S6 |
| **Classification [1]** | Metal Corrosion Category 1, Acute Toxicity (Oral) Category 4, Skin Corrosion/Irritation Category 1B, Serious Eye Damage Category 1, Chronic Aquatic Hazard Category 4 |
| ***Legend:*** | *1. Classified by Chemwatch; 2. Classification drawn from HSIS ; 3. Classification drawn from EC Directive 1272/2008 - Annex VI* |

### Label elements

**Continued...**

| | |
|---|---|
| **GHS label elements** |  |
| SIGNAL WORD | **DANGER** |

## Hazard statement(s)

| | |
|---|---|
| **H290** | May be corrosive to metals. |
| **H302** | Harmful if swallowed. |
| **H314** | Causes severe skin burns and eye damage. |
| **H318** | Causes serious eye damage. |
| **H413** | May cause long lasting harmful effects to aquatic life. |

## Precautionary statement(s) Prevention

| | |
|---|---|
| **P260** | Do not breathe dust/fume/gas/mist/vapours/spray. |
| **P280** | Wear protective gloves/protective clothing/eye protection/face protection. |
| **P234** | Keep only in original container. |
| **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): Remove/Take off immediately all contaminated clothing. Rinse skin with water/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 or doctor/physician. |
| **P363** | Wash contaminated clothing before reuse. |
| **P390** | Absorb spillage to prevent material damage. |
| **P301+P312** | IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. |
| **P304+P340** | IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. |

## Precautionary statement(s) Storage

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

## Precautionary statement(s) Disposal

| | |
|---|---|
| **P501** | Dispose of contents/container in accordance with local regulations. |

# SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

## Substances

| CAS No | %[weight] | Name |
|---|---|---|
| 7664-38-2 | >85 | phosphoric acid |
| 7732-18-5 | >10 | water |

## Mixtures

See section above for composition of Substances

# SECTION 4 FIRST AID MEASURES

## Description of first aid measures

| | |
|---|---|
| **Eye Contact** | If this product comes in contact with the eyes:<br>‣ Immediately hold eyelids apart and flush the eye continuously with running water.<br>‣ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally |

**Continued...**

| | |
|---|---|
| | ▸ lifting the upper and lower lids.<br>▸ Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.<br>▸ Transport to hospital or doctor without delay.<br>▸ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel. |
| **Skin Contact** | If skin or hair contact occurs:<br>▸ Immediately flush body and clothes with large amounts of water, using safety shower if available.<br>▸ Quickly remove all contaminated clothing, including footwear.<br>▸ Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.<br>▸ Transport to hospital, or doctor. |
| **Inhalation** | ▸ If fumes or combustion products are inhaled remove from contaminated area.<br>▸ Lay patient down. Keep warm and rested.<br>▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.<br>▸ 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.<br>▸ Transport to hospital, or doctor, without delay.<br>▸ Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.<br>▸ Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).<br>▸ 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.<br>▸ Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered.<br>**This must definitely be left to a doctor or person authorised by him/her.**<br>(ICSC13719) |
| **Ingestion** | ▸ For advice, contact a Poisons Information Centre or a doctor at once.<br>▸ Urgent hospital treatment is likely to be needed.<br>▸ If swallowed do **NOT** induce vomiting.<br>▸ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.<br>▸ Observe the patient carefully.<br>▸ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.<br>▸ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.<br>▸ Transport to hospital or doctor without delay. |

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

for phosphate salts intoxication:

- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.
- Ingestion of large quantities of phosphate salts (over 1.0 grams for an adult) may cause an osmotic catharsis resulting in diarrhoea and probable abdominal cramps. Larger doses such as 4-8 grams will almost certainly cause these effects in everyone. In healthy individuals most of the ingested salt will be excreted in the faeces with the diarrhoea and, thus, not cause any systemic toxicity. Doses greater than 10 grams hypothetically may cause systemic toxicity.
- Treatment should take into consideration both anionic and cation portion of the molecule.
- All phosphate salts, except calcium salts, have a hypothetical risk of hypocalcaemia, so calcium levels should be monitored.

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]

**Continued...**

## SECTION 5 FIREFIGHTING MEASURES

### Extinguishing media

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

### 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. |
| **Fire/Explosion Hazard** | ,<br>‣ 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>phosphorus oxides (POx) |
| **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

<table>
<tr><td><b>Minor Spills</b></td><td>Environmental hazard - contain spillage.<br>‣ 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>‣ Avoid breathing vapours and contact with skin and eyes.<br>‣ Control personal contact with the substance, by using protective equipment.<br>‣ Contain and absorb spill with sand, earth, inert material or vermiculite.<br>‣ Wipe up.<br>‣ Place in a suitable, labelled container for waste disposal.</td></tr>
<tr><td><b>Major Spills</b></td><td>Environmental hazard - contain spillage.<br>Chemical Class:acidic compounds, inorganic<br>For release onto land: recommended sorbents listed in order of priority.
<table>
<tr><td>SORBENT TYPE</td><td>RANK</td><td>APPLICATION</td><td>COLLECTION</td><td>LIMITATIONS</td></tr>
</table>
LAND SPILL - SMALL
<table>
<tr><td>foamed glass - pillows</td><td>1</td><td>throw</td><td>pitchfork</td><td>R, P, DGC, RT</td></tr>
<tr><td>expanded mineral - particulate</td><td>2</td><td>shovel</td><td>shovel</td><td>R, I, W, P, DGC</td></tr>
<tr><td>foamed glass - particulate</td><td>2</td><td>shovel</td><td>shovel</td><td>R, W, P, DGC</td></tr>
</table>
LAND SPILL - MEDIUM</td></tr>
</table>

Continued...

| | | | | |
|---|---|---|---|---|
| expanded mineral -particulate | 1 | blower | skiploader | R, I, W, P, DGC |
| foamed glass- particulate | 2 | blower | skiploader | R, W, P, DGC |
| foamed glass - particulate | 3 | throw | skiploader | R, W, P, DGC |

Legend
DGC: Not effective where ground cover is dense
R; Not reusable
I: Not incinerable
P: Effectiveness reduced when rainy
RT:Not effective where terrain is rugged
SS: Not for use within environmentally sensitive sites
W: Effectiveness reduced when windy
Reference: Sorbents for Liquid Hazardous Substance Cleanup and Control;
R.W Melvold et al: Pollution Technology Review No. 150: Noyes Data Corporation 1988

- 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.
- 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.

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

## SECTION 7 HANDLING AND STORAGE

### Precautions for safe handling

**Safe handling**

- **DO NOT** allow clothing wet with material to stay in contact with skin
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Avoid contact with moisture.
- Avoid contact with incompatible materials.
- When handling, **DO NOT** eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately. Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storage and handling recommendations contained within this SDS.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

**Other information**

- 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 SDS.

### Conditions for safe storage, including any incompatibilities

**Suitable container**

- **DO NOT** use aluminium or galvanised containers
- Check regularly for spills and leaks
- Glass container is suitable for laboratory quantities
- Lined metal can, lined metal pail/ can.
- Plastic pail.
- Polyliner drum.
- Packing as recommended by manufacturer.
- Check all containers are clearly labelled and free from 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;

Continued...

| | |
|---|---|
| | ▸ 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. |
| **Storage incompatibility** | Phosphoric acid:<br>▸ is a medium-strong acid which produces violent reaction with bases<br>▸ may produce violent react when water is added to the concentrated form<br>▸ reacts violently with solutions containing ammonia or bleach, azo compounds, epoxides and other polymerisable compounds<br>▸ reacts, possibly violently with amines, aldehydes, alkanolamines, alcohols, alkylene oxides, amides, ammonia, ammonia hydroxide, calcium oxide, cyanides, epichlorohydrin, esters, halogenated organics, isocyanates, ketones, oleum, organic anhydrides, sodium tetraborate, sulfides, sulfuric acid, strong oxidisers, vinyl acetate<br>▸ forms explosive mixtures with nitromethane<br>▸ at elevated temperatures attacks many metals producing hydrogen gas<br>▸ at room temperature does not attack stainless steel, copper or its alloys<br>▸ attacks glass, ceramics, and some plastics, rubber and coatings<br>▸ Inorganic acids are generally soluble in water with the release of hydrogen ions. The resulting solutions have pH's of less than 7.0.<br>▸ Inorganic acids neutralise chemical bases (for example: amines and inorganic hydroxides) to form salts - neutralisation can generate dangerously large amounts of heat in small spaces.<br>▸ The dissolution of inorganic acids in water or the dilution of their concentrated solutions with additional water may generate significant heat.<br>▸ 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.<br>▸ Inorganic acids react with active metals, including such structural metals as aluminum and iron, to release hydrogen, a flammable gas.<br>▸ Inorganic acids can initiate the polymerisation of certain classes of organic compounds.<br>▸ Inorganic acids react with cyanide compounds to release gaseous hydrogen cyanide.<br>▸ 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 H2S and SO3), dithionites (SO2), and even carbonates.<br>▸ Acids often catalyse (increase the rate of) chemical reactions.<br>▸ Reacts vigorously with alkalis<br>▸ Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.<br>▸ Phosphates are incompatible with oxidising and reducing agents.<br>▸ Phosphates are susceptible to formation of highly toxic and flammable phosphine gas in the presence of strong reducing agents such as hydrides.<br>▸ Partial oxidation of phosphates by oxidizing agents may result in the release of toxic phosphorus oxides. |

## 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 | phosphoric acid | Phosphoric acid | 1 mg/m3 | 3 mg/m3 | Not Available | Not Available |

#### EMERGENCY LIMITS

| Ingredient | Material name | TEEL-1 | TEEL-2 | TEEL-3 |
|---|---|---|---|---|
| phosphoric acid | Phosphoric acid | Not Available | Not Available | Not Available |

| Ingredient | Original IDLH | Revised IDLH |
|---|---|---|
| phosphoric acid | 10,000 mg/m3 | 1,000 mg/m3 |
| water | Not Available | Not Available |

#### MATERIAL DATA

The saturated vapour concentration of phosphoric acid exceeds the TLV. The TLV-TWA is based by analogy from comparable experience and data for sulfuric acid. Exposure at or below this limit is thought to prevent throat irritation amongst unacclimatised workers.
Fumes of phosphorus pentoxide at concentrations between 0.8 and 5.4 mg/m3 were reported to be noticeable but not uncomfortable whilst concentrations between 3.6 and 11.3 mg/m3 produced coughing in unacclimatised workers but were tolerable. Concentrations of 100 mg/m3 were unbearable except in inured workers.

**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.

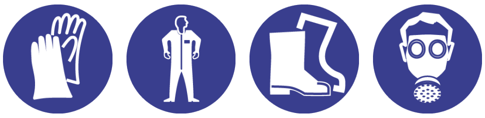
| Type of Contaminant: | Air Speed: |
|---|---|
| solvent, vapours, degreasing etc., evaporating from tank (in still air). | 0.25-0.5 m/s<br>(50-100 f/min.) |
| aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation) | 0.5-1 m/s<br>(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<br>(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<br>(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.

**Personal protection**



**Eye and face protection**

- Chemical goggles.
- Full face shield may be required for supplementary but never for primary protection of eyes.
- 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**

- Wear chemical protective gloves, e.g. PVC.
- Wear safety footwear or safety gumboots, e.g. Rubber
- When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

**Continued...**

| | |
|---|---|
| | The selection of 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.<br>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.<br>Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.<br>Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:<br>· frequency and duration of contact,<br>· chemical resistance of glove material,<br>· glove thickness and<br>· dexterity<br>Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).<br>· 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.<br>· 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.<br>· Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use.<br>· Contaminated gloves should be replaced.<br>For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended.<br>It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.<br>Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers’ technical data should always be taken into account to ensure selection of the most appropriate glove for the task.<br>Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:<br>· Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.<br>· Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential<br>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. |
| **Body protection** | See Other protection below |
| **Other protection** | ‣ Overalls.<br>‣ PVC Apron.<br>‣ PVC protective suit may be required if exposure severe.<br>‣ Eyewash unit.<br>‣ Ensure there is ready access to a safety shower. |
| **Thermal hazards** | Not Available |

## 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:

PHOSPHORIC ACID

| **Material** | **CPI** |
|---|---|
| NAT+NEOPR+NITRILE | A |
| NATURAL RUBBER | A |
| NATURAL+NEOPRENE | A |
| NEOPRENE | A |
| NEOPRENE/NATURAL | A |
| NITRILE | A |
| NITRILE+PVC | A |
| PE | A |
| PVC | A |
| SARANEX-23 | A |

* CPI - Chemwatch Performance Index

## Respiratory protection

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

Continued...

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.

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

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

| | |
|---|---|
| **Appearance** | Clear colourless odourless syrupy liquid with acid reaction; mixes with water. Commercial phosphoric acid @ 75-85% is a mobile liquid. Viscosity @ 30 deg, C: 75% (7 cP); 81.5% (25 cP); 85% (32 cP). Dissociation constants @ 25 deg C: Step 1 7.52 x 10e-3 (2.12 pH); Step 2 6.23 x 10e-8 (7.21pH); Step 3 2.2 x 10e-13 (12.67pH) High concentrations may crystallize in cold weather. Acid at 100% is in the form of crystals. Mixes with water and alcohol.\|Pure anhydrous phosphoric acid (syn: orthophosphoric acid, phosphoric(V) acid) is a white solid that melts at 42.35 °C to form a colorless, viscous liquid.\|Most people and even chemists refer to orthophosphoric acid as phosphoric acid, which is the IUPAC name for this compound. The prefix ortho is used to distinguish the acid from other phosphoric acids, called polyphosphoric acids. Orthophosphoric acid is a non-toxic, inorganic, rather weak triprotic acid, which, when pure, is a solid at room temperature and pressure. Orthophosphoric acid is a very polar molecule; therefore it is highly soluble in water. The oxidation state of phosphorus (P) in ortho- and other phosphoric acids is, 5; the oxidation state of all the oxygen atoms (O) is -2 and all the hydrogen atoms (H) is, 1. Triprotic means that an orthophosphoric acid molecule can dissociate up to three times, giving up an H, each time, which typically combines with a water molecule, H2O |

| | | | |
|---|---|---|---|
| **Physical state** | Liquid | **Relative density (Water = 1)** | 1.58@75%1.65-1.8 |
| **Odour** | Not Available | **Partition coefficient n-octanol / water** | Not Available |
| **Odour threshold** | Not Available | **Auto-ignition temperature (°C)** | Not Applicable |
| **pH (as supplied)** | Not Available | **Decomposition temperature** | Not Available |
| **Melting point / freezing point (°C)** | 21(85%)-17.5 75% | **Viscosity (cSt)** | Not Available |
| **Initial boiling point and boiling range (°C)** | 154(85%)135(75%) | **Molecular weight (g/mol)** | 98.00 (100%). |
| **Flash point (°C)** | Not Available | **Taste** | Not Available |
| **Evaporation rate** | Very Slow | **Explosive properties** | Not Available |
| **Flammability** | Not Available | **Oxidising properties** | Not Available |
| **Upper Explosive Limit (%)** | Not Applicable | **Surface Tension (dyn/cm or mN/m)** | Not Available |
| **Lower Explosive Limit (%)** | Not Applicable | **Volatile Component (%vol)** | 15-25 (water) |
| **Vapour pressure (kPa)** | 0.75 75% @20C | **Gas group** | Not Available |
| **Solubility in water (g/L)** | Miscible | **pH as a solution (1%)** | 2.12 Step 1 0.1N |
| **Vapour density (Air = 1)** | Not available. | **VOC g/L** | Not Available |

**Continued...**

## SECTION 10 STABILITY AND REACTIVITY

| | |
|---|---|
| **Reactivity** | See section 7 |
| **Chemical stability** | ‣ 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** | Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may produce serious damage to the health of the individual.<br>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>Inhalation of phosphoric acid vapour or mist may cause choking, coughing, headache, weakness and dizziness. Prolonged or repeated inhalation of vapour or mist may cause pulmonary oedema (lung damage) and cyanosis<br>Exposure to high concentrations causes bronchitis and is characterised by the onset of haemorrhagic pulmonary oedema. |
| **Ingestion** | Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.<br>The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.<br>Ingestion of acidic corrosives may produce circumoral burns with a distinct discolouration of the mucous membranes of the mouth, throat and oesophagus. Immediate pain and difficulties in swallowing and speaking may also be evident. Oedema of the epiglottis may produce respiratory distress and possibly, asphyxia. Nausea, vomiting, diarrhoea and a pronounced thirst may occur. More severe exposures may produce a vomitus containing fresh or dark blood and large shreds of mucosa. Shock, with marked hypotension, weak and rapid pulse, shallow respiration and clammy skin may be symptomatic of the exposure. Circulatory collapse may, if left untreated, result in renal failure. Severe cases may show gastric and oesophageal perforation with peritonitis, fever and abdominal rigidity. Stricture of the oesophageal, gastric and pyloric sphincter may occur as within several weeks or may be delayed for years. Death may be rapid and often results from asphyxia, circulatory collapse or aspiration of even minute amounts. Delayed deaths may be due to peritonitis, severe nephritis or pneumonia. Coma and convulsions may be terminal.<br>Phosphates are slowly and incompletely absorbed from the gastrointestinal tract and are unlikely (other than in abuse) to produce the systemic effects which occur when introduced by other routes. Such effects include vomiting, lethargy, fever, diarrhoea, falls in blood pressure, slow pulse, cyanosis, carpal spasm, coma and tetany. These effects result following sequestration of blood calcium.<br>Ingestion of large amounts of phosphate salts (over 1 gm for an adult) may produce osmotic catharsis resulting in diarrhoea and probably, abdominal cramp. Large doses (4-8 gm) will almost certainly produce these effects in most individuals. Most of the ingested salt will be excreted in the faeces of healthy individuals without producing systemic toxicity. Doses in excess of 10 gm may produce systemic toxicity.<br>Ingestion of large quantity of phosphoric acid may cause severe abdominal pains, thirst, acidaemia, difficult breathing, convulsions, collapse, shock and death.<br>Although less hazardous than nitric and sulfuric acid, phosphoric acid has equal corrosive action upon ingestion. Death of an individual 19 days after ingestion of phosphoric acid was due to recurrent internal haemorrhage. Necrosis of the upper and lower digestive tract and pancreas was evident at autopsy. |
| **Skin Contact** | The material can produce chemical burns following direct contact with the skin.<br>The material produces severe skin irritation; evidence exists, or practical experience predicts, that the material either:<br>‣ produces severe inflammation of the skin in a substantial number of individuals following direct contact, and/or<br>‣ produces significant and severe inflammation when applied to the healthy intact skin of animals (for up to four hours), such inflammation being present twenty-four hours or more after the end of the exposure period.<br>‣ Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis. |

Continued...

**NOTE:** Prolonged contact is unlikely, given the severity of response, but repeated exposures may produce severe ulceration.
Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.
Open cuts, abraded or irritated skin should not be exposed to this material
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.
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.

**Eye**

The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating.
When applied to the eye(s) of animals, the material produces severe ocular lesions which are present twenty-four hours or more after instillation.
Direct eye contact with acid corrosives may produce pain, lachrymation, photophobia and burns. Mild burns of the epithelia generally recover rapidly and completely. Severe burns produce long-lasting and possible irreversible damage. The appearance of the burn may not be apparent for several weeks after the initial contact. The cornea may ultimately become deeply vascularised and opaque resulting in blindness.

**Chronic**

|
Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.
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.
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.

Dogs given daily doses of sodium phosphate dibasic for 9-22 weeks showed calcium deposits in the kidneys (nephrocalcinosis) with disseminated atrophy of the proximal tubule. Animals fed on sodium phosphate dibasic and potassium dihydrogen phosphate, in both short- and long-term studies, showed increased bone porosity; hyperparathyroidism and soft tissue calcification were also evident.
The product does not cause phosphorus poisoning.

**phosphoric acid**

| TOXICITY | IRRITATION |
|---|---|
| Dermal (rabbit) LD50: >1260 mg/kg[2] | Eye (rabbit): 119 mg - SEVERE |
| Inhalation (rat) LC50: 0.0255 mg/L/4hr[2] | Skin (rabbit):595 mg/24h - SEVERE |
| Oral (rat) LD50: 1.7 ml[1] | |

**water**

| TOXICITY | IRRITATION |
|---|---|
| Oral (rat) LD50: >90000 mg/kg[2] | Not Available |

***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*

**PHOSPHORIC ACID**

for acid mists, aerosols, vapours
Data from assays for genotoxic activity in vitro suggest that eukaryotic cells are susceptible to genetic damage when the pH falls to about 6.5. Cells from the respiratory tract have not been examined in this respect. Mucous secretion may protect the cells of the airways from direct exposure to inhaled acidic mists, just as mucous plays an important role in protecting the gastric epithelium from its auto-secreted hydrochloric acid. In considering whether pH itself induces genotoxic events in vivo in the respiratory system, comparison should be made with the human stomach, in which gastric juice may be at pH 1-2 under fasting or nocturnal conditions, and with the human urinary bladder, in which the pH of urine can range from <5 to > 7 and normally averages 6.2. Furthermore, exposures to low pH in vivo differ from exposures *in vitro* in that, *in vivo*, only a portion of the cell surface is subjected to the adverse conditions, so that perturbation of intracellular homeostasis may be maintained more readily than in vitro.

The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
The material may produce severe skin irritation after prolonged or repeated exposure, and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) thickening of the epidermis.
Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.
Prolonged contact is unlikely, given the severity of response, but repeated exposures may produce severe ulceration.

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.<br>phosphoric acid ( 85%) |
| **PHOSPHORIC ACID & WATER** | 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 available but does not fill the criteria for classification*
✓ *– Data required to make classification available*
⊘ *– Data Not Available to make classification*

## SECTION 12 ECOLOGICAL INFORMATION

### Toxicity

| Ingredient | Endpoint | Test Duration (hr) | Species | Value | Source |
|---|---|---|---|---|---|
| **phosphoric acid** | LC50 | 96 | Fish | 75.1mg/L | 2 |
| **phosphoric acid** | EC50 | 48 | Crustacea | >376mg/L | 2 |
| **phosphoric acid** | EC50 | 72 | Algae or other aquatic plants | 77.9mg/L | 2 |
| **phosphoric acid** | EC50 | 24 | Crustacea | >376mg/L | 2 |
| **phosphoric acid** | NOEC | 72 | Algae or other aquatic plants | <7.5mg/L | 2 |
| ***Legend:*** | *Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 - 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* | | | | |

May cause long-term adverse effects in the aquatic environment.
Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.
Wastes resulting from use of the product must be disposed of on site or at approved waste sites.
On the basis of available evidence concerning either toxicity, persistence, potential to accumulate and or observed environmental fate and behaviour, the material may present a danger, immediate or long-term and /or delayed, to the structure and/ or functioning of natural ecosystems.
**Ecotoxicity:**
The tolerance of water organisms towards pH margin and variation is diverse. Recommended pH values for test species listed in OECD guidelines are between 6.0 and almost 9. Acute testing with fish showed 96h-LC50 at about pH 3.5

The principal problems of phosphate contamination of the environment relates to eutrophication processes in lakes and ponds. Phosphorus is an essential plant nutrient and is usually the limiting nutrient for blue-green algae. A lake undergoing eutrophication shows a rapid growth of algae in surface waters. Planktonic algae cause turbidity and flotation films. Shore algae cause ugly muddying, films and damage to reeds. Decay of these algae causes oxygen depletion in the deep water and shallow water near the shore. The process is self-perpetuating because anoxic conditions at the sediment/water interface causes the release of more adsorbed phosphates from the sediment. The growth of algae produces undesirable effects on the treatment of water for drinking purposes, on fisheries, and on the use of lakes for recreational purposes.
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 |
|---|---|---|
| phosphoric acid | HIGH | HIGH |
| water | LOW | LOW |

**Continued...**

### Bioaccumulative potential

| Ingredient | Bioaccumulation |
|---|---|
| phosphoric acid | LOW (LogKOW = -0.7699) |
| water | LOW (LogKOW = -1.38) |

### Mobility in soil

| Ingredient | Mobility |
|---|---|
| phosphoric acid | HIGH (KOC = 1) |
| water | LOW (KOC = 14.3) |

## SECTION 13 DISPOSAL CONSIDERATIONS

### Waste treatment methods

| | |
|---|---|
| **Product / Packaging disposal** | ‣ Containers may still present a chemical hazard/ danger when empty.<br>‣ Return to supplier for reuse/ recycling if possible.<br>Otherwise:<br>‣ 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.<br>‣ Where possible retain label warnings and SDS and observe all notices pertaining to the product.<br>Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.<br>A Hierarchy of Controls seems to be common - the user should investigate:<br>‣ Reduction<br>‣ Reuse<br>‣ Recycling<br>‣ Disposal (if all else fails)<br>This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.<br>‣ **DO NOT** allow wash water from cleaning or process equipment to enter drains.<br>‣ It may be necessary to collect all wash water for treatment before disposal.<br>‣ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.<br>‣ Where in doubt contact the responsible authority.<br>‣ Recycle wherever possible.<br>‣ 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.<br>‣ Treat and neutralise at an approved treatment plant. Treatment should involve: Neutralisation with soda-ash or soda-lime 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).<br>‣ Decontaminate empty containers with 5% aqueous sodium hydroxide or soda ash, followed by water. Observe all label safeguards until containers are cleaned and destroyed. |

## SECTION 14 TRANSPORT INFORMATION

### Labels Required

| | |
|---|---|
| |  |
| **Marine Pollutant** | NO |
| **HAZCHEM** | 2R |

### Land transport (ADG)

| | |
|---|---|
| **UN number** | 1805 |
| **UN proper shipping name** | PHOSPHORIC ACID, SOLUTION |
| **Transport hazard class(es)** | Class: 8<br>Subrisk: Not Applicable |

Continued...

| | |
|---|---|
| **Packing group** | III |
| **Environmental hazard** | Not Applicable |
| **Special precautions for user** | Special provisions: 223<br>Limited quantity: 5 L |

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

| | |
|---|---|
| **UN number** | 1805 |
| **UN proper shipping name** | Phosphoric acid, solution |
| **Transport hazard class(es)** | ICAO/IATA Class: 8<br>ICAO / IATA Subrisk: Not Applicable<br>ERG Code: 8L |
| **Packing group** | III |
| **Environmental hazard** | Not Applicable |
| **Special precautions for user** | Special provisions: A3A803<br>Cargo Only Packing Instructions: 856<br>Cargo Only Maximum Qty / Pack: 60 L<br>Passenger and Cargo Packing Instructions: 852<br>Passenger and Cargo Maximum Qty / Pack: 5 L<br>Passenger and Cargo Limited Quantity Packing Instructions: Y841<br>Passenger and Cargo Limited Maximum Qty / Pack: 1 L |

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

| | |
|---|---|
| **UN number** | 1805 |
| **UN proper shipping name** | PHOSPHORIC ACID SOLUTION |
| **Transport hazard class(es)** | IMDG Class: 8<br>IMDG Subrisk: Not Applicable |
| **Packing group** | III |
| **Environmental hazard** | Not Applicable |
| **Special precautions for user** | EMS Number: F-A, S-B<br>Special provisions: 223<br>Limited Quantities: 5 L |

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

| Source | Product name | Pollution Category | Ship Type |
|---|---|---|---|
| IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk | Phosphoric acid | Z | 3 |

## SECTION 15 REGULATORY INFORMATION

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

**PHOSPHORIC ACID(7664-38-2) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

Australia Exposure Standards
Australia Inventory of Chemical Substances (AICS)
Australia Hazardous Substances Information System - Consolidated Lists

**WATER(7732-18-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

Australia Inventory of Chemical Substances (AICS)

| National Inventory | Status |
|---|---|

Continued...

| | |
|---|---|
| Australia - AICS | Y |
| Canada - DSL | Y |
| Canada - NDSL | N (phosphoric acid; water) |
| China - IECSC | Y |
| Europe - EINEC / ELINCS / NLP | Y |
| Japan - ENCS | N (water) |
| Korea - KECI | Y |
| New Zealand - NZIoC | Y |
| Philippines - PICCS | Y |
| USA - TSCA | Y |
| ***Legend:*** | *Y = All ingredients are on the inventory*<br>*N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)* |

## SECTION 16 OTHER INFORMATION

### Other information

### Ingredients with multiple cas numbers

| Name | CAS No |
|---|---|
| phosphoric acid | 7664-38-2, 16271-20-8 |

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
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
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

# Safety Data Sheet

# QUICKLIME

## 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

| | |
|---|---|
| **Product Name** | QUICKLIME |
| **Supplier Name** | Cockburn Cement Limited A.B.N. 50.008.673.470 |
| **Address** | PO Box 38, Hamilton Hill, WA 6963 |
| **Manufacturing Plant(s)** | Munster Works, Lot 242 Russell Road East, Munster, WA 6166<br>Dongara Works, Kailis Drive, Dongara, WA 6525 |
| **Telephone** | 08 9411 1000 |
| **Fax** | 08 9411 1150 |
| **Emergency** | Bus Hrs 08 9411 1000 A/Hrs 08 9411 1000 |
| **Email** | orders@cockburncement.com.au |
| **Web Site** | http://www.cockburncement.com.au & www.swancement.com.au |
| **Synonym(s)** | Calcium Oxide, Calcium monoxide, Rock Lime, Fluxing Lime, Burnt Lime, Unslaked Lime |
| **Use(s)** | Quicklime is used to produce Hydrated Lime. Quicklime used in alumina and steel production, neutralising water, sewerage treatment, and sugar refining. Quicklime is also used in gold production to keep cyanide solutions alkaline. |

## 2. HAZARDS IDENTIFICATION

This product is classified as hazardous according to Safe Work Australia criteria.
Only classified as a dangerous good by the criteria of the ADG code when transported by air.

**GHS Classifications**

| | |
|---|---|
| Skin Corrosion/Irritation: | Category 2 |
| Serious Eye Damage / Eye Irritation: | Category 1 |
| Specific Target Organ Systemic Toxicity (Single Exposure): | Category 3 |

**SIGNAL WORD** **DANGER**

**Pictograms**

**Hazard statements**

| | |
|---|---|
| H315 | Causes skin irritation. |
| H318 | Causes serious eye damage. |
| H335 | May cause respiratory irritation. |

**Prevention statements**

| | |
|---|---|
| P261 | Avoid breathing dust/fume/gas/mist/vapours/spray. |
| P264 | Wash skin thoroughly after handling. |
| P271 | Use only outdoors or in a well-ventilated area. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |

**Response statements**

| | |
|---|---|
| P302 + P352 | IF ON SKIN: Wash with plenty of soap and water. |
| P304 + P340 | IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. |
| P305 + P351 + P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P310 | Immediately call a POISON CENTRE or doctor/physician. |
| P332 + P313 | If skin irritation occurs: Get medical advice/attention. |

**Disposal statements**

| | |
|---|---|
| P501 | Dispose of contents/container in accordance with relevant regulations. |

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

| **Ingredient** | **Formula** | **Conc.** | **CAS No.** |
|---|---|---|---|
| CALCIUM OXIDE | $CaO$ | 80 - 90% | 1305-78-8 |
| MAGNESIUM OXIDE | $MgO$ | 4.5 - 5.5% | 1309-48-4 |
| CRYSTALLINE SILICA (QUARTZ) | $SiO_2$ | 1 - 5% | 14808-60-7 |
| LIMESTONE | $CaCO_3$ | 0 – 2% | 1317-65-3 |
| ALUMINIUM OXIDE | $Al_2O_3$ | 0 – 1.5% | 1344-28-1 |
| IRON (III) OXIDE | $Fe_2O_3$ | 0 – 1% | 1309-37-1 |

## 4. FIRST AID MEASURES

| | |
|---|---|
| **Eye** | If a lime dust or slurry is splashed into the eyes flush thoroughly for 15 minutes then seek urgent medical attention. |
| **Inhalation** | Remove from dusty area to fresh air. If symptoms persist, seek medical attention. |
| **Skin** | Quickly, but gently, wipe material off skin. Immediately remove all contaminated clothing and footwear. Wash skin thoroughly with copious amounts of water. |
| **Ingestion** | Rinse mouth and lips with water. Do not induce vomiting. Give water to drink to dilute stomach contents. Ingestion is not considered a likely exposure route. If symptoms persist, seek medical attention. |
| **Advice to Doctor** | Treat symptomatically. Contact Poisons Information Centre (131126 Australia wide). |
| **First Aid Facilities** | Eye wash station. |

**Additional Information - Aggravated Medical Conditions**

| | |
|---|---|
| **Inhalation** | Inhalation of dust through prolonged, repeated exposure can cause membrane irritation, bronchitis, pneumonia, silicosis (scarring of the lung.) It may also increase the risk of scleroderma (a disease affecting the connective tissue of the skin, joints, blood vessels and internal organs) and lung cancer. Epidemiological studies have shown that smoking increases the risk of bronchitis, silicosis (scaring of the lung) and lung cancer in those exposed to crystalline silica. |
| **Skin** | Irritating to the skin. Quicklime can cause irritant dermatitis or even alkaline burns depending upon concentartion and duration of exposure. |
| **Eye** | Irritating to the eye. If a large volume of lime dust (or slurry) is splashed into the eye alkaline burns can cause permanent damage. |

## 5. FIRE FIGHTING

| | |
|---|---|
| **Flammability** | Not flammable. Does not support combustion of other materials, but on contact with water or acids may generate sufficient heat to ignite surrounding materials. DO NOT USE WATER for fire fighting. USE DRY CHEMICAL OR $CO_2$ TYPE EXTINGUISHERS. |
| **Fire and Explosion** | Non flammable. No fire or explosion hazard exists. |
| **Extinguishing** | Non flammable. |
| **Hazchem Code** | None Allocated. |

## 6. ACCIDENTAL RELEASE MEASURES

| | |
|---|---|
| **Spillage** | If spilt (bulk), contact emergency services if appropriate. Wear dust-proof goggles, PVC/rubber gloves, a Class P2 respirator (where an inhalation risk exists), coveralls and rubber boots. Clear area of all unprotected personnel. Prevent spill entering drains or waterways. Collect and place in sealable containers for disposal or reuse. Avoid generating dust. Quicklime should be slowly hydrated by SLOW addition to water then neutralised with dilute Hydrochloric Acid eg 6M, before disposal. |
| **Emergency Procedures** | Follow safety requirements for personal protection under Section 8 Exposure Controls/ Personal Protection. |

## 7. HANDLING AND STORAGE

| | |
|---|---|
| **Storage** | Steel silos and airtight rail or road tankers are the usual forms of storage and transport. Common storage and handling equipment must NOT be used for Quicklime. Enclosed conveyors with extraction equipment and dust collection are required for safe handling. Quicklime must NOT come into contact with materials containing water or water of crystallisation, eg copper, alum, ferric sulphates. Quicklime must be kept away from moisture, steam, acid or acid fumes to prevent violent reactions. |
| **Handling** | Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas. |
| **Property/ Environmental** | Refer to Section 13. |

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

| | |
|---|---|
| **Ventilation** | Avoid generating dust. All work with Quicklime should be carried out in such a way as to minimise exposure to dust and repeated skin contact. Where dust could be generated whilst handling Quicklime, use local mechanical ventilation or extraction in areas where dust could escape into the work environment. For bulk deliveries, closed pumping systems are recommended. |
| **Exposure Standards** | ALUMINIUM OXIDE (1344-28-1)<br>ES-TWA: 10 mg/m$^3$ (Respirable Dust)<br>CALCIUM CARBONATE (1317-85-3)<br>ES-TWA: 10 mg/m$^3$ (Respirable Dust)<br>CALCIUM OXIDE (1305-78-8)<br>ES-TWA: 2 mg/m$^3$ (Respirable Dust; Alkaline)<br>IRON (III) OXIDE (1309-37-1)<br>ES-TWA: 5 mg/m$^3$ (Respirable Dust)<br>MAGNESIUM OXIDE (1309-48-4)<br>ES-TWA: 10 mg/m$^3$ (Respirable Dust)<br>SILICA, CRYSTALLINE – QUARTZ (14808-60-7)<br>ES-TWA: 0.1 mg/m$^3$ (Respirable Dust) |
| **PPE** | Wear dust-proof goggles and rubber or PVC gloves. Where an inhalation risk exists, wear a Class P2 respirator. If there is potential for prolonged and/or excessive skin contact, wear coveralls. At high dust levels, wear a Class P3 respirator or a Powered Air Purifying Respirator (PAPR) with Class P3 filter. |

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|---|---|---|---|
| **Appearance** | Granular off-white amorphous powder | **Solubility (water)** | Sparingly soluble, reacts vigorously with water |
| **Odour** | Slight Odour | **Specific Gravity** | 3.2 to 3.4 |
| **pH** | Approximately 12 | **% Volatiles** | Not Available |
| **Vapour Pressure** | Not Available | **Flammability** | Non Flammable |
| **Vapour Density** | Not Available | **Flash Point** | Not Relevant |
| **Boiling Point** | 2850$^0$c | **Upper Explosion Limit** | Not Relevant |
| **Melting Point** | 2570$^0$C | **Lower Explosion Limit** | Not Relevant |
| **Evaporation Rate** | Not Available | **Autoignition Temperature** | Not Available |
| **Bulk Density** | 950 - 1050 kg/m$^3$ | | |
| **Particle Size** | 50% < 75 microns | | |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| **Reactivity** | Incompatible with hydrofluoric acid (violently) and phosphorus pentoxide. Reacts (potentially vigorously) with water generating heat and evolving calcium hydroxide. |
| **Decomposition Products** | May evolve toxic gases if heated to decomposition. |

## 11. TOXICOLOGICAL INFORMATION

| | |
|---|---|
| **Acute Toxicity** | No known toxicity data available for this product. |
| **Eye** | Corrosive. Severe irritant upon contact with powder/dust. Over exposure may result in pain, redness, corneal burns and ulceration with possible permanent damage. |
| **Inhalation** | Corrosive. Over exposure to powder – dust (when mixing) may result in severe mucous membrane irritation of nose and throat, coughing and bronchitis at high levels. |
| **Skin** | Irritating and drying to skin. May cause alkaline burns and irritant or allergic dermatitis. |
| **Ingestion** | Corrosive. Ingestion may result in ulceration and burns to the mouth and throat, nausea, vomiting, abdominal pain and diarrhoea. Ingestion is not considered a likely exposure route. |
| **Toxicity Data** | CALCIUM HYDROXIDE (1305-62-0)<br>LD50 (Ingestion): 7300 mg/kg (mouse)<br>MAGNESIUM HYDROXIDE (1309-43-8)<br>LD50 (Ingestion): 8500 mg/kg (rat, mouse)<br>SILICA, CRYSTALLINE – QUARTZ (1408-60-7)<br>Carcinogenicity: Classified as a human carcinogen (IARC Group 1) |

## 12. ECOLOGICAL INFORMATION

**Environment** Limited ecotoxicity data was available for this product at the time this report was prepared. Ensure appropriate measures are taken to prevent this product from entering the environment.

## 13. DISPOSAL CONSIDERATIONS

**Waste Disposal** For small amounts; VERY SLOWLY, hydrate (add water) and then neutralise with dilute hydrochloric acid (eg 6M HCl) to pH of 7-8. Dilute and flush to sewer or landfill. For large amounts, material can be readily recycled. Contact the manufacturer for additional information.

**Legislation** Dispose of in accordance with relevant local legislation.

## 14. TRANSPORT INFORMATION

Only classified as a dangerous good when transported by air (ADG Code).

Transport is by rail or road in bulk or bag form.

Drivers of trucks transporting bagged product should ensure that the bags are properly restrained.

**IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)**

| | | | | | |
|---|---|---|---|---|---|
| **Shipping Name** | Calcium Oxide | | | | |
| **UN No** | 1910 | **Hazchem Code** | 4W | **Pkg Group** | 111 |
| **DG Class** | 8 | **Subsidiary Risk(s)** | None Allocated | **EPG** | None Allocated |

## 15. REGULATORY INFORMATION

**Poison Schedule** A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

**AICS** All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

## 16. OTHER INFORMATION

**Additional Information** IARC – GROUP 1 – PROVEN HUMAN CARCINOGEN. This product contains an ingredient for which there is sufficient evidence to have been classified by the International Agency for Research into Cancer as a human carcinogen. The use of products known to be human carcinogens should be strictly monitored and controlled.

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES: The Recommendation for protective equipment contained within this SDS report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE: It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare an SDS report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

ABBREVIATIONS:
$mg/m^3$ - Milligrams per cubic metre
ppm - Parts Per Million
ES-TWA - Exposure Standard - Time Weighted Average
pH - relates to hydrogen ion concentration - this value will relate to a scale of 0 - 14, where 0 is highly acidic and 14 is highly alkaline.
CAS# - Chemical Abstract Service Number - used to uniquely identify chemical compounds.
IARC - International Agency for Research on Cancer.
M – Moles per litre, a unit of concentration

**Report Status**

This document has been compiled by Cockburn Cement Limited the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ("SDS").

While Cockburn Cement Limited has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, Cockburn Cement Limited accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

**Contact Point**

For further information on this product contact:

| | | |
|---|---|---|
| Telephone: | Office hours | 08 9411 1000 |
| | After hours | 08 9411 1000 |
| Facsimile: | | 08 9411 1150 |
| Web site: | http://www.cockburncement.com.au | |

**Advice Note**

The information in this document is believed to be accurate. Please check the currency of this SDS by contacting:

08 9411 1000
or
http://www.cockburncement.com.au or www.swancement.com.au

The provision of this information should not be construed as a recommendation to use this product in violation of any patent rights or in breach of any statute or regulation. Users are advised to make their own determination as to the suitability of this information in relation to their particular purposes and specific circumstances. Users should read this SDS and consider the information in the context of how the product will be handled and used in the workplace and in conjunction with other substances or products.

## 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

| | |
|---|---|
| **Product Name** | **SHELLSAND** |
| **Supplier Contact Details** | Cockburn Cement A.B.N. 50.008.673.470<br>PO Box 38, Hamilton Hill, WA 6963<br>Munster Works, Lot 242, Russell Road East, Munster WA 6166<br>Kwinana Works, Leath Road, Kwinana WA 6167<br>Dongara Works, Kailis Drive, Dongara, WA 6525 |
| **Telephone** | 08 9411 1000 |
| **Fax** | 08 9411 1150 |
| **Emergency** | Bus Hrs 08 9411 1000 A/Hrs 08 9411 1000 |
| **Email** | orders@cockburncement.com.au |
| **Web Site** | http://www.cockburn.com.au & www.swancement.com.au |
| **Synonym(s)** | Shellsand, calcite |
| **Use(s)** | Soil pH control, construction material, raw material for quicklime manufacture |

## 2. HAZARDS IDENTIFICATION

This product is classified as hazardous according to Safe Work Australia criteria.
Not classified as a dangerous good by the criteria of the ADG code, IMDG or IATA.

**GHS Classifications**
Specific Target Organ Systemic Toxicity (Repeated Exposure): Category 2

**SIGNAL WORD** **WARNING**

**Pictograms**

**Hazard statements**

| | |
|---|---|
| H319 | Causes Eye Irritation |
| H373 | May cause damage to lungs and respiratory tract through prolonged or repeated exposure. |

**Prevention statements**

| | |
|---|---|
| P260 | Do not breathe dust/fume/gas/mist/vapours/spray. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |

**Response statements**

| | |
|---|---|
| P302 + P352 | IF ON SKIN: Wash with plenty of soap and water. |
| P304 + P340 | IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. |
| P305 + P351 + P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P333 + P313 | If skin irritation or rash occurs: Get medical advice/attention. |

**Disposal statements**

| | |
|---|---|
| P501 | Dispose of contents/container in accordance with relevant regulations. |

| | | | | | |
|---|---|---|---|---|---|
| **UN No** | None Allocated | **Hazchem Code** | None Allocated | **Pkg Group** | None Allocated |
| **DG Class** | None Allocated | **Subsidiary Risk(s)** | None Allocated | **EPG** | None Allocated |

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

| Ingredient | Formula | Conc. | CAS No. |
|---|---|---|---|
| ARAGONITE/CALCITE | $CaCO_3$ | 90 – 95% | 1317-65-3 |
| CRYSTLLINE SILICA (QUARTZ) | $SiO_2$ | 5 - 10% | 14808-60-7 |

## 4. FIRST AID MEASURES

| | |
|---|---|
| **Eye** | Flush thoroughly with flowing water for at least 15 minutes. Seek medical attention if symptoms persist. |
| **Inhalation** | Remove from dusty area to fresh air. If symptoms persist, seek medical attention. |
| **Skin** | Wash thoroughly with water. A shower may be required. |
| **Ingestion** | Rinse mouth and lips with water. Do not induce vomiting. Give water to drink to dilute stomach contents. If symptoms persist, seek medical attention. |
| **Advice to Doctor** | Treat symptomatically. Contact Poisons Information Centre (131126 Australia wide). |
| **First Aid Facilities** | Eye wash station. |

## 5. FIRE FIGHTING

| | |
|---|---|
| **Flammability** | Non flammable. Does not support combustion of other materials. |
| **Fire and Explosion** | Non flammable. In a fire, aragonite and calcite decomposes into calcium oxide and carbon dioxide and may react vigorously with acids, generating carbon dioxide – an asphyxiant. |
| **Extinguishing** | Non flammable. |
| **Hazchem Code** | None. |

## 6. ACCIDENTAL RELEASE MEASURES

| | |
|---|---|
| **Spillage** | If spilt (bulk), contact emergency services if appropriate. Wear dust-proof goggles, PVC/rubber gloves, a Class P2 respirator (where an inhalation risk exists), coveralls and rubber boots. Clear area of all unprotected personnel. Prevent spill entering drains or waterways. Collect and place in sealable containers for disposal or reuse. Avoid generating dust. |
| **Emergency Procedures** | Follow safety requirements for personal protection under Section 8 Exposure Controls/ Personal Protection. |

## 7. HANDLING AND STORAGE

**Storage**

Shellsand must NOT come into contact with acids, fluorine, aluminium (hot) and ammonium salts to avoid violent reactions.

**Handling**

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas.

**Property/ Environmental**

Refer to Section 13.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Ventilation**

Where a dust inhalation hazard exists, mechanical extraction ventilation is recommended. Maintain dust levels below the recommended exposure standard.

**Exposure Standards**

CALCIUM CARBONATE (1317-65-3)
ES-TWA: 10 $mg/m^3$ (Respirable Dust)
SILICA, CRYSTALLINE – QUARTZ (14808-60-7)
ES-TWA: 0.1 $mg/m^3$ (Respirable Dust)

**PPE**

Wear dust-proof goggles and rubber gloves to avoid any potential abrasive scracthes to the eyes and/or skin.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|---|---|---|---|
| **Appearance** | Fine sand to coarse grey crystalline rock. | **Solubility (water)** | Slight, hardens on mixing with water |
| **Odour** | Odourless | **Specific Gravity** | 2.7 |
| **pH** | 8 -9 (Alkaline) | **% Volatiles** | Not Available |
| **Vapour Pressure** | Not Available | **Flammability** | Non Flammable |
| **Vapour Density** | Not Available | **Flash Point** | Not Relevant |
| **Boiling Point** | Not Available | **Upper Explosion Limit** | Not Relevant |
| **Melting Point** | > 1200°C | **Lower Explosion Limit** | Not Relevant |
| **Evaporation Rate** | Not Available | **Autoignition Temperature** | Not Available |
| **Bulk Density** | 1600 kg/m3 | | |

## 10. STABILITY AND REACTIVITY

**Reactivity**

Reacts vigorously with acids, fluorine, aluminium (hot) and ammonium salts.

**Decomposition Products**

In a fire, limestone decomposes into calcium oxide and carbon dioxide and may react vigorously with acids, generating carbon dioxide – an asphyxiant.

## 11. TOXICOLOGICAL INFORMATION

| | |
|---|---|
| **Acute Toxicity** | No known toxicity data available for this product |
| **Eye** | Irritating to the eye through mechanical abrasion. |
| **Inhalation** | Non irritating to the respiratory system due to product sizing. |
| **Skin** | Irritating to the skin through mechanical abrasion. |
| **Ingestion** | Due to product form, ingestion is not considered a likely exposure route. |
| **Mutagenicity** | Insufficient data available for this product to classify as a mutagen. |
| **Carcinogenicity** | Shellsand is not classified as a carcinogen by NOHSC. |

## 12. ECOLOGICAL INFORMATION

| | |
|---|---|
| **Environment** | Aragonite and Calcite are naturally occurring mineral rock deposits and are not anticipated to cause any adverse environmental effects. |

## 13. DISPOSAL CONSIDERATIONS

| | |
|---|---|
| **Waste Disposal** | For the disposal of small spillages, sweep up (wet sweeping/vacuum) and remove with the usual waste. For large spillages contain using sand or earth then transfer to a storage container for disposal with the usual waste. |
| **Legislation** | Dispose of in accordance with relevant local legislation. Keep out of sewer and stormwater drains. |

## 14. TRANSPORT INFORMATION

Not classified as a dangerous good by the criteria of the ADG Code.

| | | | | | |
|---|---|---|---|---|---|
| **Shipping Name** | None Allocated | | | | |
| **UN No** | None Allocated | **Hazchem Code** | None Allocated | **Pkg Group** | None Allocated |
| **DG Class** | None Allocated | **Subsidiary Risk(s)** | None Allocated | **EPG** | None Allocated |

## 15. REGULATORY INFORMATION

| | |
|---|---|
| **Poison Schedule** | A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP). |
| **AICS** | All chemicals listed on the Australian Inventory of Chemical Substances (AICS). |

## 16. OTHER INFORMATION

| | |
|---|---|
| **Additional Information** | IARC – GROUP 1 – PROVEN HUMAN CARCINOGEN. This product contains an ingredient for which there is sufficient evidence to have been classified by the International Agency for Research into Cancer as a human carcinogen. The use of products known to be human carcinogens should be strictly monitored and controlled. |

RESPIRATORS: In general the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES: The Recommendation for protective equipment contained within this SDS report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

HEALTH EFFECTS FROM EXPOSURE: It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare an SDS report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

ABBREVIATIONS:
mg/m$^3$ - Milligrams per cubic metre
ppm - Parts Per Million
µm – micrometer = m x 10$^{-6}$
ES-TWA - Exposure Standard - Time Weighted Average
CNS - Central Nervous System
NOS - Not Otherwise Specified
pH - relates to hydrogen ion concentration - this value will relate to a scale of 0 - 14, where 0 is highly acidic and 14 is highly alkaline.
CAS# - Chemical Abstract Service Number - used to uniquely identify chemical compounds.
IARC - International Agency for Research on Cancer.

**Report Status**

This document has been compiled by Cockburn Cement the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ("SDS").

While Cockburn Cement has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, Cockburn Cement accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

**Contact Point**

For further information on this product contact:

Telephone: Office hours 08 9411 1000
After hours 08 9411 1000
Facsimile: 08 9411 1150
Web site: http://www.cockburn.com.au

**Advice Note**

The information in this document is believed to be accurate. Please check the currency of this SDS by contacting:

08 9411 1000
or
http://www.cockburncement.com.au or www.swancement.com.au

The provision of this information should not be construed as a recommendation to use this product in violation of any patent rights or in breach of any statute or regulation. Users are advised to make their own determination as to the suitability of this information in relation to their particular purposes and specific circumstances. Users should read this SDS and consider the information in the context of how the product will be handled and used in the workplace and in conjunction with other substances or products.