

SAFETY DATA SHEET

Pro-Kleen Granular

Issued: October 2020

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1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

GHS Product Identifier:	Pro-Kleen Granular
Product Codes:	PKLEGR
Product Use:	Pesticide Spray Tank Decontaminant.
Supplier:	GREVILLIA AG PTY LTD
ABN:	36 083 323 817
Address:	10 Bult Drive Brendale Queensland 4500 Australia.
Telephone Number:	(07) 3205 1788
Facsimile:	(07) 3205 4327
Emergency Telephone Numbers:	Emergency Tel 24hr 0428 727 300 Poisons Information Centre Australia: 13 1126

2. HAZARD IDENTIFICATION

GHS classification of the substance/mixture Classification	HAZARDOUS CHEMICAL. DANGEROUS GOODS. According to the WHS Regulations and the ADG Code. Metal Corrosion Category 1 Oxidizing Solid Category 2 Acute Toxicity (Oral) Category 4 Skin Corrosion/Irritation Category 1B Serious Eye Damage Category 1 Acute Aquatic Hazard Category 1 Specific target organ toxicity - single exposure Category 3 (respiratory tract irritation)
Signal Word (s)	DANGER
Hazard Statement (s)	H290 May be corrosive to metals. H272 May intensify fire; oxidiser. H302 Harmful if swallowed. H314 Causes severe skin burns and eye damage. H335 May cause respiratory irritation. H400 Very toxic to aquatic life. AUH031 Contact with acid liberates toxic gas



Poisons Schedule	S6
Precautionary statement – Prevention	P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking. P221 Take any precaution to avoid mixing with combustibles/organic material. P260 Do not breathe dust/fume/gas/mist/vapours/spray. P280 Wear protective gloves/protective clothing/eye protection/face protection. P220 Keep/Store away from clothing/organic material/combustible materials. P270 Do not eat, drink or smoke when using this product. P273 Avoid release to the environment.

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Precautionary statement – 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. P370+P378 In case of fire: Use water spray/fog for extinction. P363 Wash contaminated clothing before reuse. P391 Collect spillage. 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.	
Storage	P403+P233	Store in a well-ventilated place. Keep container tightly closed.
	P405	Store locked up.
Disposal	P501	Dispose of contents/container in accordance with local regulations.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS Number	Proportion
SODIUM SULPHATE ANHYDROUS	7757-82-6	30 - 60
SODIUM HYDROXIDE	1310-73-2	10 - 30
SODIUM TRIPOLYPHOSPHATE	7758-29-4	10 - 30
CALCIUM HYPOCHLORITE	7778-54-3	10 - 30
INGREDIENTS NOT DETERMINED TO BE HAZARDOUS		<10
DYE		< 1

4. FIRST AID MEASURES

Description of Necessary First Aid Measures

Ingestion:	For advice, contact a Poisons Information Centre or a doctor at once. Urgent hospital treatment is likely to be needed. If swallowed do NOT induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. Observe the patient carefully. Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. Transport to hospital or doctor without delay.
Eye:	If this product comes in contact with the eyes: Immediately hold eyelids apart and flush the eye continuously with running water. Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. Transport to hospital or doctor without delay.

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Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin:

If skin or hair contact occurs:

Immediately flush body and clothes with large amounts of water, using safety shower if available.

Quickly remove all contaminated clothing, including footwear.

Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.

Transport to hospital, or doctor.

Inhalation:

If fumes or combustion products are inhaled remove from contaminated area.

Lay patient down. Keep warm and rested.

Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.

Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.

Transport to hospital, or doctor.

Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.

Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).

As this reaction may be delayed up to 24 hours after exposure, affected individuals need complete rest (preferably in semi-recumbent posture) and must be kept under medical observation even if no symptoms are (yet) manifested.

Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered. This must definitely be left to a doctor or person authorised by him/her. (ICSC13719)

Indication of any immediate medical attention and special treatment needed

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).

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SKIN AND EYE:

Injury should be irrigated for 20-30 minutes.

Excellent warning properties force rapid escape of personnel from chlorine vapour thus most inhalations are mild to moderate. If escape is not possible, exposure to high concentrations for a very short time can result in dyspnea, haemophysis and cyanosis with later complications being tracheobroncho-pneumonitis and pulmonary oedema. Oxygen, intermittent positive pressure breathing apparatus and aerosolised bronchodilators are of therapeutic value where chlorine inhalation has been light to moderate. Severe inhalation should result in hospitalisation and treatment for a respiratory emergency.

Any chlorine inhalation in an individual with compromised pulmonary function (COPD) should be regarded as a severe inhalation and a respiratory emergency. [CCINFO, Dow 1988]

Effects from exposure to chlorine gas include pulmonary oedema which may be delayed. Observation in hospital for 48 hours is recommended

Diagnosed asthmatics and those people suffering from certain types of chronic bronchitis should receive medical approval before being employed in occupations involving chlorine exposure.

If burn is present, treat as any thermal burn, after decontamination.

For acute or repeated exposures to hypochlorite solutions:

Release of small amounts of hypochlorous acid and acid gases from the stomach following ingestion, is usually too low to cause damage but may be irritating to mucous membranes. Buffering with antacid may be helpful if discomfort is evident.

Evaluate as potential caustic exposure.

Decontaminate skin and eyes with copious saline irrigation. Check exposed eyes for corneal abrasions with fluorescein staining.

Emesis or lavage and catharsis may be indicated for mild caustic exposure.

Chlorine exposures require evaluation of acid/base and respiratory status.

Inhalation of vapours or mists may result in pulmonary oedema.

Depending on the degree of exposure, periodic medical examination is indicated. The symptoms of lung oedema often do not manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation is therefore essential. Immediate administration of an appropriate spray, by a doctor or a person authorised by him/her should be considered.

5. FIRE FIGHTING MEASURES

Extinguishing Media:

FOR SMALL FIRE:

USE FLOODING QUANTITIES OF WATER.

DO NOT use dry chemical, CO₂, foam or halogenated-type extinguishers.

FOR LARGE FIRE

Flood fire area with water from a protected position.

Special hazards arising from the substrate or mixture

Fire Incompatibility

Avoid storage with reducing agents.

Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous.

Advice for firefighters:

Fire Fighting

Alert Fire Brigade and tell them location and nature of hazard.

May be violently or explosively reactive.

Wear full body protective clothing with breathing apparatus.

Prevent, by any means available, spillage from entering drains or water courses.

Consider evacuation (or protect in place).

Use water delivered as a fine spray to control fire and cool adjacent area.

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Avoid spraying water onto liquid pools.
DO NOT approach containers suspected to be hot.
Cool fire exposed containers with water spray from a protected location.
If safe to do so, remove containers from path of fire.
Equipment should be thoroughly decontaminated after use.

Fire/Explosion Hazard

Non combustible. Contains Oxidiser.
Not considered a significant fire risk, however containers may burn.
Decomposition may produce toxic fumes of:
Chlorine
Chlorine oxides
metal oxides
phosphorous oxides
oxides of sulphur
thionyl chloride
May emit corrosive fumes.
Solid in contact with water or moisture reacts violently, and solutions are highly alkaline and may cause severe skin burns.

Hazchem: 4WE

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: See Section 8

Environmental precautions: See Section 12

Minor Spills:

Drains for storage or use areas should have retention basins for pH adjustments and dilution of spills before discharge or disposal of material.
Check regularly for spills and leaks.
Clean up all spills immediately.
Avoid breathing vapours and contact with skin and eyes.
Control personal contact with the substance, by using protective equipment.
Contain and absorb spill with sand, earth, inert material or vermiculite.
Wipe up.
Place in a suitable, labelled container for waste disposal.

Major Spills:

DO NOT touch the spill material
Clear area of personnel and move upwind.
Alert Fire Brigade and tell them location and nature of hazard.
May be violently or explosively reactive.
Wear full body protective clothing with breathing apparatus.
Prevent, by any means available, spillage from entering drains or water course.
Consider evacuation (or protect in place).
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.

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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.

7. HANDLING AND STORAGE

Precautions for Safe Handling:

DO NOT allow clothing wet with material to stay in contact with skin

WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material.

Avoid personal contact and inhalation of dust, mist or vapours.

Provide adequate ventilation.

Always wear protective equipment and wash off any spillage from clothing.

Keep material away from light, heat, flammables or combustibles.

Keep cool, dry and away from incompatible materials.

Avoid physical damage to containers.

DO NOT repack or return unused portions to original containers. Withdraw only sufficient amounts for immediate use.

Use only minimum quantity required.

When handling NEVER smoke, eat or drink.

Always wash hands with soap and water after handling.

Use only good occupational work practice.

Observe manufacturer's storage and handling recommendations contained within this SDS.

WARNING: To avoid violent reaction, ALWAYS add material to water and NEVER water to material.

Conditions for Safe Storage, Including Any Incompatibilities:

Suitable container

DO NOT use aluminium or galvanised containers

Store in original containers.

Keep containers securely sealed as supplied.

Store in a cool, well ventilated area.

Keep dry.

Store under cover and away from sunlight.

Store away from flammable or combustible materials, debris and waste. Contact may cause fire or violent reaction.

Store away from incompatible materials and foodstuff containers.

DO NOT stack on wooden floors or pallets.

Protect containers from physical damage.

Check regularly for leaks.

Observe manufacturer's storage and handling recommendations contained within this SDS.

Storage incompatibility

Contact with acids produces toxic fumes

Chlorine:

- is a strong oxidiser
- reacts explosively with acetylene, boron, diborane, or other boron hydrides at ordinary temperatures
- forms easily ignited, sensitive explosive mixtures with gases and vapours such as anhydrous ammonia, benzene, butane, ethane, ethylene, fluorine, hydrocarbons, formaldehyde, hydrogen, hydrogen bromide, hydrogen chloride, oxygen, propane, propene in the presence of heat, hot surfaces, welding arc, sparks, strong sunlight, UV light, or a catalyst such as mercury oxide

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- contact with 2-carboxymethylisothiuronium chloride or s-ethylisothiuronium hydrogen sulfate may form nitrogen trichloride. a dangerous explosive
- reacts violently with combustible materials, reducing agents, acetylene, molten aluminium (ignites on contact with the gas), alcohols, arsenic compounds, arsine, bismuth, boron, calcium compounds, carbon, diethylzinc, dimethylformamide, ether, ethyl phosphine, fluorine, germanium, hydrocarbons, hydrazine, hydrogen sulfide, hydroxylamine, iridium, lithium, lithium acetylide, magnesium, magnesium oxide, magnesium phosphide, mercury sulfide, methyl vinyl ether, metal carbides, molybdenum trioxide, potassium acetylide, sodium acetylide, sulfamic, sulfur dioxide, triethylborane and many other substances
- forms explosive mixtures with gasoline and petroleum products, such as mineral oil, , greases, phosphorus, silicones, turpentine, finely divided metals, organic compounds
- in its liquid form reacts explosively with carbon disulfide, linseed oil, propylene, rubber, wax, white phosphorus
- attacks some plastics and coatings
- may cause dangerous fires in contact with hot solid metals (especially steel - iron/ chlorine fire can cause the bursting of storage containers)
- when moist (150 ppm in water) is extremely corrosive to most metals especially in the presence of heat.
- reacts with water to give hydrogen chloride, with carbon monoxide to form phosgene, and with sulfur dioxide to give sulfuric chloride

Chlorine storage areas shall be separated from anhydrous ammonia storage areas by a vapour path of at least 10 meters

Inorganic peroxy compounds are potent oxidisers that pose fire or explosive hazards when in contact with ordinary combustible materials.

Inorganic peroxides react with organic compounds to generate organic peroxide and hydroperoxide products that react violently with reducing agents.

Inorganic oxidising agents can react with reducing agents to generate heat and products that may be gaseous (causing pressurization of closed containers). The products may themselves be capable of further reactions (such as combustion in the air).

Organic compounds in general have some reducing power and can in principle react with compounds in this class. Actual reactivity varies greatly with the identity of the organic compound.

Inorganic oxidising agents can react violently with active metals, cyanides, esters, and thiocyanates.

Inorganic reducing agents react with oxidizing agents to generate heat and products that may be flammable, combustible, or otherwise reactive. Their reactions with oxidizing agents may be violent.

Incidents involving interaction of active oxidants and reducing agents, either by design or accident, are usually very energetic and examples of so-called redox reactions.

Presence of rust (iron oxide) or other metal oxides catalyses decomposition of inorganic hypochlorites.

Contact with water can cause heating and decomposition giving off chlorine and oxygen gases. Solid hypochlorites in contact with water or moisture may generate sufficient heat to ignite combustible materials. Thermal decomposition can be sustained in the absence of oxygen.

Contact with acids produces toxic fumes of chlorine.

Bottles of strong sodium hypochlorite solution (10-14% available chlorine) burst in storage due to failure of the cap designed to vent oxygen slowly during storage. A hot summer may have exacerbated the situation. Vent caps should be checked regularly (using full personal protection) and hypochlorites should not be stored in direct sunlight or at temperatures exceeding 18 deg. C

Inorganic hypochlorites reacts violently with many incompatible materials including fuels, oils, wood, paper, etc. which become readily ignitable. Avoid contact with peroxides glycerine, lubricating oil, combustibles, amines, solvents, charcoal, metal oxides and salts, copper, mercaptan, sulfur, organic sulfides, turpentine.

Contact of hypochlorites with nitromethane, alcohols, glycerol, phenol or diethylene glycol monomethyl ether results in ignition.

Ammonia or primary aliphatic or aromatic amines may react with hypochlorites to form N-mono- or di-chloramines which are explosively unstable (but less so than nitrogen trichloride). Contact in drains between effluents containing ammonium salts and hypochlorites and acid lead to the formation of nitrogen trichloride

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which decomposed explosively. Whilst cleaning a brewery tank, reaction between an acidified ammonium sulfate cleaning preparation and sodium hypochlorite, lead nitrogen chloride formation and violent explosion
Interaction of ethyleneimine (aziridine) with hypochlorites gives an explosive N-chloro compound
Interaction of metal hypochlorites with nitrogenous materials may lead to the formation of nitrogen trichloride with explosive decomposition.

Metal oxides catalyse the oxygen decomposition of the hypochlorite.

Heating with carbon under confinement can result in explosion. Explosive interaction has occurred with carbonised food residues. After an attempt to clean these using bleach, and after heating, sodium chlorate appears to have been formed with consequent violent explosion

Removal of formic acid from industrial waste streams with sodium hypochlorite solutions produced explosion at 55 deg. C.

Explosions following reaction with methanol are attributed to formation of methyl hypochlorite.

When finely divided materials such as sugar, wood dust and paper are contaminated with hypochlorite solution they burn more readily when dry.

Avoid any contamination of this material as it is very reactive and any contamination is potentially hazardous

Avoid storage with reducing agents.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters:

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	calcium hydroxide	Calcium hydroxide	5 mg/m ³	Not Available	Not Available	Not Available
Australia Exposure Standards	chlorine	Chlorine	Not Available	Not Available	3 mg/m ³ / 1 ppm	Not Available
Australia Exposure Standards	sodium hydroxide	Sodium hydroxide	Not Available	Not Available	2 mg/m ³	Not Available

EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
calcium hypochlorite, dry	Calcium hypochlorite; (Calcium oxychloride)	2.6 mg/m ³	28 mg/m ³	170 mg/m ³
chlorine	Chlorine	Not Available	Not Available	Not Available
chlorine	Chlorine Hi dry granular (as Cl)	0.5 ppm	2 ppm	20 ppm
sodium sulfate, anhydrous	Sodium sulfate, anhydrous	9.8 mg/m ³	110 mg/m ³	650 mg/m ³
sodium hydroxide	Sodium hydroxide	Not Available	Not Available	Not Available
sodium tripolyphosphate	Sodium tripolyphosphate	0.61 mg/m ³	6.8 mg/m ³	620 mg/m ³

Ingredient	Original IDLH	Revised IDLH
calcium hypochlorite, dry	Not Available	Not Available
chlorine	10 ppm	Not Available
sodium sulfate, anhydrous	Not Available	Not Available
sodium hydroxide	10 mg/m ³	Not Available
sodium tripolyphosphate	Not Available	Not Available

MATERIAL DATA

for chlorine:

Odour Threshold Value: 0.08 ppm (detection) - olfactory fatigue may develop

NOTE: Detector tubes for chlorine, measuring in excess of 0.2 ppm, are commercially available. Long-term measurements (8 hrs) may be conducted to detect concentrations exceeding 0.13 ppm.

Smell is not a good indicator of severity of exposure in the range 0.5 to 2 ppm. In this range subjects found exposure unpleasant with itching and burning of the throat reported and occasionally an urge to cough. Significant

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differences in the responses of males and females were also recorded with females often reporting headache and drowsiness.

Exposure at 1 ppm chlorine for 8 hours produced significant changes in pulmonary function and increased subjective irritation. Similar 8 hour exposures at 0.5 ppm produced no significant pulmonary function changes and less severe subjective irritation. Exposures for 2 hours at 2 ppm chlorine produced no significant changes in pulmonary irritation.

An 8 hour exposure at 1.5 ppm produced increased mucous secretion from the nose and increased mucous in the hypopharynx. Exposure at or below the TLV-TWA and STEL is thought to protect the worker against annoying symptoms in nose, throat and conjunctiva and declines in pulmonary function.

Odour Safety Factor(OSF)

OSF=1.6 (CHLORINE)

for sodium hydroxide:

The TLV-C is recommended based on concentrations that produce noticeable but not excessive, ocular and upper respiratory tract irritation.

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 is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.

If in spite of local exhaust an adverse concentration of the substance in air could occur, respiratory protection should be considered.

Such protection might consist of:

- a) particle dust respirators, if necessary, combined with an absorption cartridge;
- b) filter respirators with absorption cartridge or canister of the right type;
- c) fresh-air hoods or masks.

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.

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Personal protection



Safety glasses with side shields. Chemical goggles.

Safety glasses with unperforated side shields may be used where continuous eye protection is desirable, as in laboratories; spectacles are not sufficient where complete eye protection is needed such as when handling bulk quantities, where there is a danger of splashing, or if the material may be under pressure.

Chemical goggles. Whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted.

Full face shield (20 cm, 8 in minimum) may be required for supplementary but never for primary protection of eyes; these afford face protection.

Alternatively a gas mask may replace splash goggles and face shields.

Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of 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]

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent). When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended. When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended. Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use. Contaminated gloves should be replaced. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended. Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present. polychloroprene. nitrile rubber. butyl rubber. fluorocautchouc. polyvinyl chloride. Gloves should be examined for wear and/ or degradation constantly.

Other protection

Overalls.
P.V.C. apron.
Barrier cream.
Skin cleansing cream.
Eye wash unit.

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9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Pale Blue divided solid	Relative Density (Water = 1)	Not Applicable
Physical state	Divided solid	Partition co-efficient n-octanol / water	Not Available
Odour	Chlorine odour	Autoignition Temperature	Not Available
Odour Threshold	Not Determined	Decomposition Temperature	Not Available
pH (as supplied)	Not Applicable	Viscosity	Not Applicable
Melting Point / Freezing Point (°C)	Not Applicable	Molecular Weight	Not Applicable
Initial Boiling point and boiling range (°C)	Not Applicable	Taste	Not Applicable
Flash Point (°C)	Not Applicable	Explosive Properties	Not Available
Evaporation Rate	Not Determined	Oxidizing Properties	Oxidiser
Flammability	Not Flammable	Surface Tension (mN/m)	Not Determined
Upper Explosive Limit (UEL %)	Not Applicable	Volatile Component	Not Applicable
Lower Explosive Limit (LEL %)	Not Applicable	Gas Group	Not Applicable
Vapour pressure (kPa)	Not Available	pH as a solution (1%)	>13
Solubility in water (g/L)	Soluble	VOC g/L	Not Applicable
Vapour density (Air = 1)	Not Determined		

10. STABILITY AND REACTIVITY

Reactivity:	See Section 7
Chemical Stability:	Strong Alkali – contact with water liberates significant heat Contact with Acids liberates toxic chlorine gas.
Possibility of hazardous reactions:	See Section 7
Conditions to avoid:	See Section 7
Incompatible materials:	See Section 7
Hazardous decomposition products:	See section 5

11. TOXICOLOGICAL INFORMATION

Inhalation: Evidence shows, or practical experience predicts, that the material produces irritation of the respiratory system, in a substantial number of individuals, following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system.

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. Symptoms may include a tightness in the chest, dyspnoea, frothy sputum, cyanosis and dizziness. Findings may include hypotension, a weak and rapid pulse and moist rales.

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.

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Symptoms of overexposure include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting.

Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled. If prior damage to the circulatory or nervous systems has occurred or if kidney damage has been sustained, proper screenings should be conducted on individuals who may be exposed to further risk if handling and use of the material result in excessive exposures.

Ingestion: 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. Profuse salivation with an inability to swallow or speak may also result. Even where there is limited or no evidence of chemical burns, both the oesophagus and stomach may experience a burning pain; vomiting and diarrhoea may follow. The vomitus may be thick and may be slimy (mucous) and may eventually contain blood and shreds of mucosa. Epiglottal oedema may result in respiratory distress and asphyxia. Marked hypotension is symptomatic of shock; a weak and rapid pulse, shallow respiration and clammy skin may also be evident. Circulatory collapse may occur and, if uncorrected, may produce renal failure. Severe exposures may result in oesophageal or gastric perforation accompanied by mediastinitis, substernal pain, peritonitis, abdominal rigidity and fever. Although oesophageal, gastric or pyloric stricture may be evident initially, these may occur after weeks or even months and years. Death may be quick and results from asphyxia, circulatory collapse or aspiration of even minute amounts. Death may also be delayed as a result of perforation, pneumonia or the effects of stricture formation.

Accidental ingestion of the material may be damaging to the health of the individual.

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 gastrointestinal tract.

Skin: The material can produce severe chemical burns following direct contact with the skin. Skin contact is not thought to have harmful health effects (as classified under EC Directives); the material may still produce health damage following entry through wounds, lesions or abrasions. 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. A 5% aqueous solution of sodium hydroxide applied to the skin of rabbits for 4 hours produced severe necrosis. Instillation of a 1% solution into the conjunctival sac failed to produce ocular or conjunctival injury in rabbits provided the eye was promptly irrigated with copious amounts of water. 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. Open cuts, abraded or irritated skin should not be exposed to this material. 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.

The material produces severe skin irritation; evidence exists, or practical experience predicts, that the material either:

produces severe inflammation of the skin in a substantial number of individuals following direct contact, and/or 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.

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

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epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.

NOTE: Prolonged contact is unlikely, given the severity of response, but repeated exposures may produce severe ulceration.

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. Direct contact with alkaline corrosives may produce pain and burns. Oedema, destruction of the epithelium, corneal opacification and iritis may occur. In less severe cases these symptoms tend to resolve. In severe injuries the full extent of the damage may not be immediately apparent with late complications comprising a persistent oedema, vascularisation and corneal scarring, permanent opacity, staphyloma, cataract, symblepharon and loss of sight.

Chronic Effects: 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. Gastrointestinal disturbances may also occur. Chronic exposures may result in dermatitis and/or conjunctivitis. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. Long term exposure to high dust concentrations may cause changes in lung function (i.e. pneumoconiosis) caused by particles less than 0.5 micron penetrating and remaining in the lung. A prime symptom is breathlessness. Lung shadows show on X-ray.

Reference Data

	TOXICITY	IRRITATION
Sodium Hydroxide	Not Available	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
calcium hypochlorite, dry	Oral (rat) LD50: 850 mg/kg[2]	Not Available
chlorine	Inhalation (rat) LC50: 0.2995-1.671 mg//hr Oral (rat) LD50: >237 mg/kg[1]	Not Available
sodium sulfate	Oral (mouse) LD50: 5989 mg/kg[2]	Not Available
sodium tripolyphosphate	Dermal (rabbit) LD50: >3160 mg/kg[2] Oral (rat) LD50: >2000 mg/kg[1]	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

The acute oral LD50 of calcium hypochlorite was 790 mg/kg in male rats. Inhalation exposures to concentrations of greater than about 500 ppm (10 min or more) may be fatal for rats. Based on human experience and control studies in volunteers, it can be concluded that the acute NOAEL for humans was considered to be 0.5 ppm (1.5 mg/m³).

Hypochlorite salts are extremely corrosive and can cause severe damage to the eyes and skin. Calcium hypochlorite is reported to be corrosive to the skin and has severe effects that can be expected from exposure to the eyes, which is ascribable to the alkalinity of calcium cation (pH=12.0 at 1 % as free available chlorine (FAC*)). Moderate to severe lesions in the respiratory tract were reported after exposure to chlorine that may emerge in case of accidental misuse of hypochlorite salts. Exposure to chlorine at 9 ppm (27 mg/m³) for 6 h/day during 1, 3 and 5 days was reported to cause epithelial necrosis, cellular exfoliation, erosion, ulceration and squamous metaplasia in the nasal passage of rats and mice. For either of Ca or Na salt, reliable skin sensitisation studies are not available and case reports are available but no reliable case report could be found showing a sensitisation potential in humans.

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12. ECOLOGICAL INFORMATION

Ingredient	Endpoint	Test Duration (hr)	Species	Value	Source
Sodium hydroxide	LC50	96	Fish	125mg/L	4
	NOEC	96	Fish	56mg/L	4
calcium hypochlorite, dry	LC50	96	Fish	0.023mg/L	4
	EC50	48	Crustacea	0.073mg/L	4
chlorine	NOEC	24	Fish	<0.01mg/L	1
	LC50	96	Fish	0.014mg/L	4
	EC50	48	Crustacea	0.026mg/L	2
	EC50	96	Algae or other aquatic plants	ca.0.1- ca.0.4mg/L	2
sodium sulfate	NOEC	360	Fish	0.014mg/L	2
	LC50	96	Fish	56mg/L	4
	EC50	48	Crustacea	2564mg/L	1
sodium tripolyphosphate	EC50	96	Algae or other aquatic plants	1900mg/L	4
	NOEC	168	Fish	<220mg/L	4
	EC50	48	Crustacea	>70.7- <101.3mg/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

Very toxic to aquatic organisms.

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.

DO NOT discharge into sewer or waterways.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

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.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

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.

DO NOT allow wash water from cleaning or process equipment to enter drains.

It may be necessary to collect all wash water for treatment before disposal.

In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.

Where in doubt contact the responsible authority.

Recycle wherever possible.

Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.

Dispose of by: burial in a land-fill specifically licenced to accept chemical and / or pharmaceutical wastes or incineration in a licenced apparatus (after admixture with suitable combustible material).

Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

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14. TRANSPORTATION INFORMATION

Labels Required:



Marine Pollutant:	YES
HAZCHEM:	4WE
Land transport (ADG):	
UN Number:	1759
UN Proper Shipping Name:	CORROSIVE SOLID NOS (Contains sodium hydroxide and calcium hypochlorite)
DG Class None:	8
Subrisk:	Not Applicable
Packing Group:	II
Environmental Hazard:	YES
Special precautions for user	
Special provisions:	Not Applicable
Limited Quantity:	1kg

15. REGULATORY INFORMATION

Packaging Labelling:	Poison S6. Not to be Taken. Keep Out of Reach of Children. Read Safety Directions Before Opening or Using.
AICS Status:	All ingredients are on the inventory
Other Information:	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

16. OTHER INFORMATION

The information in this material safety data sheet refers to the concentrated material. When diluted as described on the label the acute health effects of exposure may be less severe.

This material safety data sheet supersedes all previous issues.

It is the responsibility of the Purchasers of this product to ensure that all safety information and environmental information is provided to any people who may use this product.

The information contained within this safety data sheet is correct to the best of our knowledge and is provided in good faith. Grevillia Ag cannot control the conditions in which it is used so therefore each user must, prior to usage, assess and control the risks arising from their use of the material

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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	NOAEL	No Observed Adverse Effect Level
PC—STEL	Permissible Concentration-Short Term Exposure Limit	LOAEL	Lowest Observed Adverse Effect Level
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
ACGIH	American Conference of Governmental Industrial Hygienists	LOD	Limit Of Detection
STEL	Short Term Exposure Limit	OTV	Odour Threshold Value
TEEL	Temporary Emergency Exposure Limit	BCF	BioConcentration Factors
IDLH	Immediately Dangerous to Life or Health Concentrations	BEI	Biological Exposure Index
OSF	Odour Safety Factor		

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.....DOCUMENT END.....