GRANULATED CHLORINE
Safety Data Sheet

1. IDENTIFICATION

Product name: GRANULATED CHLORINE

Synonyms
Granulated chlorine, Bleaching Powder; Calcium Hypochlorite; Calcium Oxychloride; Calcium Salt; Chlorinated Lime; HYPOCHLOROUS ACID, CALCIUM SALT

Product Code
581

Recommended use: Water-treatment agent; Bleaching Agent; Bactericide; Algaecide+

Supplier Name	**RJS Products Pty Ltd**
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SDS Date	22 September 2016 Version 1.1

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust) 6

Globally Harmonised System

Hazard Classification Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)

Hazard Categories
Oxidising Solids - Category 2 Acute Toxicity (Oral) - Category 4
Skin Corrosion/Irritation - Category 1B
Acute Hazard To The Aquatic Environment - Category 1

Pictograms

Signal Word Danger

Hazard Statements		**H272**	May intensify fire; oxidizer.
		H302	Harmful if swallowed.
		H314	Causes severe skin burns and eye damage.
		H400	Very toxic to aquatic life.
Precautionary Statements	Prevention	**P270**	Do not eat, drink or smoke when using this product.
		P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
		P220	Keep/store away from combustible materials.
		P221	Take any precaution to avoid mixing with combustibles.
		P280	Wear protective gloves/protective clothing/eye protection/face protection.
		P264	Wash hands and contaminated body thoroughly after handling.
		P260	Do not breathe dust/fume/gas/mist/vapours/spray.
	Response	**P301 + P312**	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

	P330	Rinse mouth.
	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.
	P363	Wash contaminated clothing before reuse.
	P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
	P310	Immediately call a POISON CENTER or doctor/physician.
	P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	P321	Specific treatment (see supplemental first aid instructions on this label).
	P370 + P378	In case of fire: Use water for extinction.
Storage	**P405**	Store locked up.
Disposal	**P501**	Dispose of contents/container in accordance with local / regional / national / international regulations.

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Calcium Hypochlorite	No Data Available	7778-54-3	100.0 %
Note: Available Chlorine	No Data Available		65.0 - 70.0 %
Water	No Data Available	7732-18-5	5.5 - 10.0 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed
Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention

Eye
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

Skin
If the chemical got onto the clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower.
If the chemical got on the victim's exposed skin, such as the hands : Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cold water may be used. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.
Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhaled
Inhalation:
Allow the victim to rest in a well ventilated area. Seek immediate medical attention.
Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Advice to Doctor	Treat symptomatically based on individual reactions of patient and judgement of doctor. Effects may be delayed. May cause corneal burns. Comments: Provide general supportive measures (comfort, warmth, rest). Consult a physician and/or the nearest Poison Control Centre for all exposure except minor instance of inhalation or skin contact

Medical Conditions Aggravated by Exposure

No information available on medical conditions aggravated by exposure to this product. Chronic Exposure:
Repeated exposures to calcium hypochlorite may cause bronchitis to develop with cough and/or shortness of breath.

5. FIRE FIGHTING MEASURES

General Measures	If safe to do so, move undamaged containers from fire area. Do NOT move cargo if cargo has been exposed to heat. Dam fire control water for later disposal. Avoid generating dust.
Flammability Conditions	Thermally unstable; at higher temperatures, may undergo accelerated decomposition with release of heat and oxygen. Strong oxidizer. Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Contaminating or mixing with foreign materials such as combustibles, grease, and fuels can cause fire.
Extinguishing Media	Use flooding quantities of water as fog or spray. Use water spray to keep fire-exposed containers cool. Avoid direct contact with water; reacts with water releasing chlorine gas. Fight fire from protected location or maximum possible distance. Do not use dry chemical fire extinguishers containing ammonium compounds. Do not use carbon tetrachloride fire extinguishers. Do not allow water runoff to enter sewers or waterways.
Fire and Explosion Hazard	Not combustible (does not burn). However, calcium hypochlorite is a strong oxidizing agent and is a serious fire and explosion risk. Containers may explode when heated. Sealed containers may rupture when heated. An explosion can occur if either a carbon tetrachloride or a dry ammonium compound fire extinguisher is used to extinguish a fire involving calcium hypochlorite. Sensitive to mechanical impact.

Hazardous Products of Combustion

As in any fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. The presence of magnesium oxide in lime used to prepare calcium hypochlorite may lead to the formation of magnesium hypochlorite, which is dangerously reactive.

Special Fire Fighting Instructions	Clear fire area of all non-emergency personnel. Stay upwind. Keep out of low areas. Eliminate ignition sources. Move fire exposed containers from fire area if it can be done without risk. Do NOT allow fire fighting water to reach waterways, drains or sewers. Store fire fighting water for treatment.
Personal Protective Equipment	Fire fighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots and gloves) or chemical splash suit.
Flash Point	50°c
Lower Explosion Limit	No Data Available
Upper Explosion Limit	No Data Available
Auto Ignition Temperature	No Data Available
Hazchem Code	1W

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Avoid accidents, clean up spills immediately, observing precautions in the protective Equipments section. Remove all sources of ignition. Keep water away from spilled material. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Avoid generating dusty conditions. Remove all sources of ignition. Isolate the danger area. Use clean, non-sparking tools and equipment. Increase ventilation.
Clean Up Procedures	Contain and sweep/shovel up spills with dust binding material or use an industrial vacuum cleaner. Transfer to suitable, labelled, corrosion-resistant containers and dispose of promptly as hazardous waste. Do not get water inside containers. Do not use combustible materials such as paper towels to clean up spill.
Containment	Stop leak if safe to do so.
Environmental Precautionary Measures	Do not allow product to reach drains, sewers or waterways. If product does enter a waterway, advise the Environmental Protection Authority or your local Waste Authority.

Evacuation Criteria	Evacuate all unnecessary personnel.
Personal Precautionary Measures	Personnel involved in the clean up should wear full protective clothing as listed in section 8.

7. HANDLING AND STORAGE

Handling	Keep container dry. Keep away from heat. Keep away from sources of ignition. Keep away from combustible material Do not ingest. Do not breathe dust. Never add water to this product In case of insufficient ventilation, wear suitable respiratory equipment If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes Keep away from incompatibles such as reducing agents, combustible materials, organic materials, acids, moisture.
Storage	May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package. Corrosive materials should be stored in a separate safety storage cabinet or room.
Container	Store in original packaging as approved by manufacturer. Container type/packaging must comply with all applicable local legislation.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	No exposure standard has been established for this product by the Australian Safety and Compensation Council (ASCC). However, the exposure standard for dust not otherwise specified is 10mg/m3 (for inspirable dust) and 3mg/m3 (for respirable dust).
Exposure Limits	No Data Available
Biological Limits	No information available on biological limits for this product.
Engineering Measures	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal Protection Equipment	RESPIRATOR: For conditions of use where exposure to the dust or mist is apparent, a half-face dust/mist respirator may be worn. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. A respiratory protection program must be followed whenever workplace conditions warrant a respirator's use. (AS1715/1716). EYES: Wear appropriate protective eyeglasses, chemical safety goggles, chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area (AS1336/1337). HANDS: Wear appropriate protective gloves to prevent skin exposure (AS2161). CLOTHING: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact and safety footwear (AS3765/2210).
Work Hygienic Practices	Splash goggles. Lab coat. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Powder or Crystalline Granule
Odour	Strong Chlorine Odour (resulting from decomposition of calcium hypochlorite)
Colour	White to Greyish White
pH	10.8
Vapour Pressure	No Data Available
Relative Vapour Density	6.9 Air = 1
Boiling Point	Decomposes

Melting Point	Decomposesattemperaturesabove100°c
Freezing Point	No Data Available
Solubility	23.4g/100mL40°c
Specific Gravity	2.00 - 2.35
Flash Point	50°c
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	1?5°c
Density	No Data Available
Specific Heat	
No Data Available	
Molecular Weight	142.9848 g/mol
Net Propellant Weight	No Data Available
Octanol Water Coefficient	Log P(oct) -2.46
Particle Size	No Data Available
Partition Coefficient	No Data Available
Saturated Vapour Concentration	No Data Available
Vapour Temperature	No Data Available
Viscosity	No Data Available
Volatile Percent	0% Vol (21'C)
VOC Volume	No Data Available
Additional Characteristics	Solubility: Calcium hypochlorite reacts with many organic materials. Soluble in water; reacts, releasing chlorine gas.
Potential for Dust Explosion	No Data AvailableFast or Intensely Burning Characteristics

Flame Propagation or Burning Rate of Solid Materials

Non-Flammables That Could Contribute Unusual Hazards to a Fire

Properties That May Initiate or Contribute to Fire Intensity

No Data Available No Data Available No Data Available

No Data Available

Reactions That Release Gases or Vapours No Data Available

Release of Invisible Flammable Vapours and Gases

No Data Available

10. STABILITY AND REACTIVITY

General Information	Comments: The stability of solid calcium hypochlorite depends on the content of moisture, lime and impurities (e.g., magnesium hypochlorite and metal oxides), and the temperature and humidity of the storage area. Anhydrous calcium hypochlorite containing 1% moisture may lose 1-3% available chlorine per year.
Chemical Stability	Normally unstable, it readily undergoes violent chemical changes, but does not detonate. Small amount of water added to a container of calcium hypochlorite may generate enough heat to initiate the hazardous decomposition of this material. However, it is stable at room temperature in closed container under normal storage and handling conditions. Rapidly decomposes on exposure to air. May decompose violently if exposed to heat or direct sunlight. Instability Temperature: slowly decomposition above 120?. violent exothermic decomposition above 160?.
Conditions to Avoid	Conditions of Instability: Reacts with acids, evolving chlorine, an irritating, corrosive and toxic gas. In the presence of moisture, corrosive to most metals. Dust irritates mucous membranes. Corrosivity: Extremely corrosive in presence of aluminum, of zinc. Corrosive in presence of steel, of copper. Slightly corrosive to corrosive in presence of glass, of stainless steel(304), of stainless steel(316).
Materials to Avoid	Calcium hypochlorite is a strong oxidizer. Reacts with water and acids giving off chlorine gas. Forms explosive

compounds with ammonia and amines. Incompatible with organic materials, nitrogen compounds and combustible materials. Reducing agents, carbontetrachloride, ammonia, aliphatic amines, aromatic amines, sulfur, sulfides (inorganic, e.g. ferric sulfide, lead sulfide, sodium sulfide), metal oxides, glycerol, phenols, diethylene, glycol monomethyl ether, carbon, acetic acid + potassium, cyanides (e.g. potassium cyanide, sodium cyanide), ammonium chloride, charcoal, N,N-dichloromethylamine+heat, ethanol, menthol, iron oxide, rust, 1-propanethiol, isobutanethiol, turpentine, sodium hydrogen sulfate + starch + sodium carbonate, acetylene, hydroxy compounds (e.g. ethanol, ethylene glycol, glycerol, sugar), combustible material (e.g. anthracene, grease, oil, mercaptans, methyl carbitol, nitromethane, organic matter, and propylmercaptan)

Hazardous Decomposition Products

As in any fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. The presence of magnesium oxide in lime used to prepare calcium hypochlorite may lead to the formation of magnesium hypochlorite, which is dangerously reactive.

Calcium hypochlorite gives off oxygen, chlorine and chlorine monoxide.

Hazardous Polymerisation Hazardous Polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

General Information Toxicity to Animals: Acute oral toxicity (LD50): 850 mg/kg [Rat].
Investigated as a tumorigen and mutagen.
Chronic:
Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated eye contact may cause conjunctivitis. Effects may be delayed. Laboratory experiments have resulted in mutagenic effects. Repeated exposures to calcium hypochlorite may cause bronchitis to develop with cough and/or shortness of breath.

EyeIrritant Corrosive. Contact can cause blurred vision, redness, pain and severe tissue burns. Exposure to calcium hypochlorite dust and mist can cause eye irritation. Concentrated solutions can cause burns which may result in permanent eye damage.

Ingestion Calcium hypochlorite may cause burns to the mouth and digestive tract. Symptoms include abdominal pain, vomiting, difficulty in breathing, confusion, delirium and, in severe cases, coma and death. Corrosive. Swallowing can cause severe burns of the mouth, throat, and stomach. Can cause sore throat, vomiting, diarrhea.

Inhalation Corrosive. Extremely destructive to tissues of the mucous membranes and upper respiratory tract. Symptoms may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting. Inhalation may be fatal as a result of spasm inflammation and edema of the larynx and bronchi, chemical pneumonitis and pulmonary edema. Dust and mist may irritate the nose and throat and upper respiratory tract. When mixed with acids, chlorine gas releases. This gas can cause severe irritation of the nose and throat. Prolonged exposure to high concentration of chlorine gas may result in severe lung damage.

SkinIrritant Corrosive. Symptoms of redness, pain, and severe burn can occur. Calcium hypochlorite dust and solutions can cause irritation, and in severe cases, chemical burns with permanent scar.

Carcinogen Category No Data
Available

12. ECOLOGICAL INFORMATION

Ecotoxicity BOD5 and COD: Not available.

Persistence/Degradability Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation: The products of degradation are more toxic.

Mobility	No Data Available
Environmental Fate	No Data Available
Bioaccumulation Potential	No Data Available
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of in accordance with all local, state and federal regulations. All empty packaging should be disposed of in accordance with Local, State, and Federal Regulations or recycled/reconditioned at an approved facility.Special Precautions for Land Fill

14. TRANSPORT INFORMATION

Land Transport (Australia)
ADG

Contact a specialist disposal company or the local waste regulator for advice. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. Untreated waste calcium hypochlorite must never be discharged directly into sewers or surface water. Following decontamination, disposal of residue by secure landfill may be acceptable.

Proper Shipping Name	CALCIUM HYPOCHLORITE, HYDRATED, CORROSIVE with not less than 5.5% but not more than 16% water
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	8 Corrosive Substances
EPG	31 Oxidizing Substances
UN Number	3487
Hazchem	1W
Pack Group	II
Special Provision	No Data Available

Sea Transport
IMDG

Proper Shipping Name	CALCIUM HYPOCHLORITE, HYDRATED, CORROSIVE with not less than 5.5% but not more than 16% water
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	8 Corrosive Substances
UN Number	3487
Hazchem	1W
Pack Group	II
Special Provision	No Data Available
EMS	FH,SQ
Marine Pollutant	No

Air Transport
IATA

Proper Shipping Name	CALCIUM HYPOCHLORITE, HYDRATED, CORROSIVE with not less than 5.5% but not more than 16% water
Class	5.1 Oxidising Substances
Subsidiary Risk(s)	8 Corrosive Substances

UN Number	3487
Hazchem	1W
Pack Group	II
Special Provision	No Data Available

National Transport Commission (Australia)
Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Dangerous Goods Classification	Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

15. REGULATORY INFORMATION

General Information	No Data Available
Poisons Schedule (Aust)	6

National/Regional Inventories

Australia (AICS)	Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	Not Determined
Europe (REACh)	Not Determined
Japan (ENCS/METI)	Not Determined
Korea (KECI)	Not Determined
Malaysia (EHS Register)	Not Determined
New Zealand (NZIoC)	Listed
Philippines (PICCS)	Not Determined
Switzerland (Giftliste 1)	Not Determined
Switzerland (Inventory of Notified Substances)	Not Determined

Taiwan (NCSR)	Not Determined
USA (TSCA)	Not Determined

16. OTHER INFORMATION

Additional Information

ABBREVIATIONS:

ADB - Air-Dry Basis.
BEI - Biological Exposure Indice(s)
CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.
CNS - Central Nervous System.
EINECS - European Inventory of Existing Commercial Substances.
GHS – Globally Harmonized System
IARC - International Agency for Research on Cancer.
M - moles per litre, a unit of concentration.
mg/m3 - Milligrams per cubic meter.
NOS - Not Otherwise Specified.
NTP - National Toxicology Program.
OSHA - Occupational Safety and Health Administration.
pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm - Parts Per Million.
RTECS - Registry of Toxic Effects of Chemical Substances.
TWA/ES - Time Weighted Average or Exposure Standard.

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 Clean Plus Chemicals report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:

The recommendation for protective equipment contained within this Clean Plus Chemicals 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.

Report Status

This Safety Data Sheet document has been compiled by Clean Plus Chemicals. Further clarification regarding any aspect of this product should contact Clean Plus Chemicals directly. While Clean Plus Chemicals 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, Clean Plus Chemicals 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.