1. IDENTIFICATION

Product Name	**Calcium Hypochlorite, Hydrated, Corrosive (UN3487)**
Other Names	Calcium Hypochlorite 70%; Calcium Hypochlorite, Granular
Uses	Swimming pool chemical; oxidant.
Chemical Family	No Data Available
Chemical Formula	Ca(ClO)2
Chemical Name	Calcium hypochlorite
Product Description	Available Chlorine 70% min.

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Ltd	11 Mayo Road Wiri Auckland 2104 New Zealand	+64-9-2506222
Redox Inc.	3960 Paramount Boulevard Suite 107 Lakewood CA 90712 USA	+1-424-675-3200
Redox Chemicals Sdn Bhd	Level 2, No. 8, Jalan Sapir 33/7 Seksyen 33, Shah Alam Premier Industrial Park 40400 Shah Alam Sengalor, Malaysia	+60-3-5614-2111

Emergency Contact Details

For emergencies only; DO NOT contact these companies for general product advice.

Organisation	Location	Telephone
Poisons Information Centre	Westmead NSW	1800-251525 131126
Chemcall	Australia	1800-127406 +64-4-9179888
Chemcall	Malaysia	+64-4-9179888
Chemcall	New Zealand	0800-243622 +64-4-9179888
National Poisons Centre	New Zealand	0800-764766
CHEMTREC	USA & Canada	1-800-424-9300 CN723420 +1-703-527-3887

2. HAZARD IDENTIFICATION

Poisons Schedule (Aust) Schedule 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
			Serious Eye Damage/Irritation - Category 1
			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.
		AUH031	Contact with acids liberates toxic gas
Precautionary Statements	Prevention	**P260**	Do not breathe dust/fume/gas/mist/vapours/spray.
		P270	Do not eat, drink or smoke when using this product.
		P273	Avoid release to the environment.
		P280	Wear protective gloves/protective clothing/eye protection/face protection.
		P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
		P220	Keep/Store away from clothing/combustible materials.
	Response	**P301 + P330 + P331**	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
		P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
		P304 + P340	IF INHALED: Remove victim to fresh air and keep 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 CENTER or doctor.
		P363	Wash contaminated clothing before reuse.
		P370 + P378	In case of fire: Use water for extinction.
		P391	Collect spillage.
	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)

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

HSNO Classifications	Physical Hazards	**5.1.1B**	Oxidising substances that are liquids or solids: medium hazard

Health Hazards	**6.1D**	Substances that are acutely toxic - Harmful
	8.1A	Substances that are corrosive to metals
	8.2C	Substances that are corrosive to dermal tissue UN PGIII
	8.3A	Substances that are corrosive to ocular tissue
Environmental Hazards	**9.1A**	Substances that are very ecotoxic in the aquatic environment
	9.2A	Substances that are very ecotoxic in the soil environment
	9.3C	Substances that are harmful to terrestrial vertebrates

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Calcium hypochlorite (available Chlorine 70% min.)	Ca(ClO)2	7778-54-3	<=100 %
Water	H2O	7732-18-5	>=5.5 - <=16 %
Calcium hydroxide	Ca(OH)2	1305-62-0	1 - 5 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a Poison Centre or doctor/physician for advice.

Eye IF IN EYES: Immediately flush eyes with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Remove contact lenses if present and easy to do. Continue flushing until advised to stop by a Poisons Information Centre or a doctor, or for at least 15 minutes.

Skin IF ON SKIN (or hair): Remove material from skin immediately. In case of contact with material, immediately flush skin and hair with running water for at least 15 minutes, while removing contaminated clothing and shoes. Immediately call a Poison Centre or doctor/physician for advice. Wash contaminated clothing and shoes before reuse.

Inhaled IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a Poison Centre or doctor/physician for advice. Apply resuscitation if victim is not breathing - Administer oxygen if breathing is difficult.

Advice to Doctor Keep victim calm and warm - Obtain immediate medical care. Ensure that attending medical personnel are aware of identity and nature of the product(s) involved, and take precautions to protect themselves.

Medical Conditions Aggravated by Exposure No information available.

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. Cool containers with flooding quantities of water until well after fire is out - If impossible, withdraw from area and let fire burn. Avoid getting water inside containers: a violent reaction may occur. Dam fire control water for later disposal. ALWAYS stay away from tank ends.

Flammability Conditions OXIDIZING SUBSTANCE: Not combustible, but will accelerate burning when involved in a fire.

Extinguishing Media If material is involved in a fire, use flooding quantities of water for extinction - Do not use dry chemicals, Carbon dioxide (CO2) or foam. Large fire: Flood fire area with water from a protected position.

Fire and Explosion Hazard Risk of violent reaction or explosion! May intensify fire; oxidizer. May explode from heating, shock, friction or contamination. May ignite combustibles. Prolonged exposure to fire or heat may result in the vigorous decomposition of the material and rupture of the container.

Hazardous Products of Combustion Fire may produce irritating, toxic and/or corrosive gases.

Special Fire Fighting Instructions	Contain runoff from fire control or dilution water - Runoff may pollute waterways; Runoff may create fire or explosion hazard.
Personal Protective Equipment	Wear self-contained breathing apparatus (SCBA) and chemical splash suit. Structural firefighter's uniform will provide limited protection.
Flash Point	No Data Available
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	Ensure adequate ventilation. ELIMINATE all ignition sources. Prevent exposure to heat. Do not contaminate - Keep combustibles away from spilled material. Clean up immediately. Avoid generating dust. Do not breathe dust/fume/gas/mist/vapours and prevent contact with eyes, skin and clothing.
Clean Up Procedures	Use clean, non-sparking tools to transfer material to a clean, dry plastic container and cover loosely. Move container from spill area. Do not return spilled material to original container. *Liquid spill: Use a non-combustible material like vermiculite, sand or earth to soak up the product and place in a loosely-covered container for later disposal (see SECTION 13).
Containment	Stop leak if safe to do so - Prevent entry into waterways, drains or confined areas. Use water spray to knock down vapours or divert vapour clouds.
Decontamination	Flush with plenty of water. *Do not leave wet - Damp/wet material must be neutralized thoroughly before release.
Environmental Precautionary Measures	Spillages and decontamination runoff should be prevented from entering drains and watercourses.
Evacuation Criteria	Spill or leak area should be isolated immediately. Keep unauthorised personnel away. Keep upwind and to higher ground. Large spill: Immediately contact Police or Fire Brigade; Consider initial downwind evacuation of areas within at least 100 m.
Personal Precautionary Measures	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing (see SECTION 8). Large spill: Wear self-contained breathing apparatus (SCBA) and chemical splash suit.

7. HANDLING AND STORAGE

Handling	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Avoid generating dusts or mists. Do not breathe dust/fume/gas/mist/vapours and prevent contact with eyes, skin and clothing. Do not ingest. Wear protective gloves/protective clothing/eye protection/face protection (see SECTION 8). OXIDISING SUBSTANCE: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources - No smoking. Do not contaminate - Prevent from any contamination or contact with combustible or organic material. Avoid release to the environment - Collect spillage (see SECTION 6).
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep container tightly closed. Do not allow moisture/humidity inside containers. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources - No smoking. Keep away from clothing and other combustible materials. Keep away from incompatible materials (see SECTION 10). Store locked up.
Container	Keep in the original container.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	COMPONENT: Chlorine (CAS No. 7782-50-5): - Safe Work Australia Exposure Standard: TWA = 1 ppm (3 mg/m3) Peak limitation. - New Zealand Workplace Exposure Standard [Next review: 2023]: TWA = 0.5 ppm (1.5 mg/m3); STEL = 1 ppm (2.9 mg/m3). COMPONENT: Calcium hydroxide (CAS No. 1305-62-0): - Safe Work Australia Exposure Standard: TWA = 5 mg/m3. - New Zealand Workplace Exposure Standard [Next review: 2022]: TWA = 5 mg/m3

Exposure Limits	No Data Available
Biological Limits	No information available.
Engineering Measures	A system of local and/or general exhaust is recommended to keep employee exposures below exposure standards. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area.
Personal Protection Equipment	- Respiratory protection: In case of exposure to dust/fume/gas/mist/vapours, wear respiratory protection. Recommended: Dust/mist filtering respirator, air supplied mask or self-contained breathing apparatus (refer to AS/NZS 1715 & 1716). - Eye/face protection: Wear appropriate eye protection to prevent eye contact. Recommended: Safety goggles. - Hand protection: Wear protective gloves. Recommended: Rubber gloves. - Skin/body protection: Wear appropriate personal protective clothing to prevent skin contact. Recommended: Working clothing with long sleeves and long pants.
Special Hazards Precaustions	No information available.
Work Hygienic Practices	Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Take off immediately all contaminated clothing. Wash contaminated clothing before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Granular or tablets
Odour	Strong, Chlorine-like
Colour	White or greyish-white
pH	10 - 12 Alkaline when dissolved in water
Vapour Pressure	No Data Available
Relative Vapour Density	No Data Available
Boiling Point	No Data Available
Melting Point	No Data Available
Freezing Point	No Data Available
Solubility	approx. 20 g/100 g in water
Specific Gravity	2.1 (H_2O = 1)
Flash Point	No Data Available
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	approx. 180 °C
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	142.98 g/mol
Net Propellant Weight	No Data Available
Octanol Water Coefficient	No Data Available
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	No Data Available
VOC Volume	No Data Available
Additional Characteristics	No information available.
Potential for Dust Explosion	No information available.

Fast or Intensely Burning Characteristics	Risk of violent reaction or explosion! May explode from heating, shock, friction or contamination.
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a Fire	It is decomposed by water with evolution of chlorine gas and heat.
Properties That May Initiate or Contribute to Fire Intensity	OXIDIZING SUBSTANCE: Not combustible, but will accelerate burning when involved in a fire. May intensify fire; oxidizer. May ignite combustibles.
Reactions That Release Gases or Vapours	Fire may produce irritating, toxic and/or corrosive gases.
Release of Invisible Flammable Vapours and Gases	Harmful and explosive gas is generated by mixing with Chlorinated Isocyanuric acid.

10. STABILITY AND REACTIVITY

General Information	It is decomposed by water with evolution of chlorine gas and heat. Contact with acids liberates toxic gas!
Chemical Stability	Stable under ordinary storage and handling conditions.
Conditions to Avoid	Avoid generating dust/fume/gas/mist/vapours. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Do not contaminate - Prevent from any contamination and contact with combustible or organic material. Do not allow moisture/humidity inside containers.
Materials to Avoid	Incompatible/reactive with combustible or organic material (oils, grease, wood, paper, clothing, etc); reducing substances; inorganic bleaching powder, ammonia and ammonium salt; Nitrogen compounds, Chlorinated Isocyanuric acid.
Hazardous Decomposition Products	Chlorine and Nitrogen compounds are formed by contact with acids. Harmful and explosive gas is generated by mixing with Chlorinated Isocyanuric acid.
Hazardous Polymerisation	No information available.

11. TOXICOLOGICAL INFORMATION

General Information

- Acute toxicity: Harmful if swallowed. Ingestion may cause damage to mucous membranes and digestive tract. Contact with acids liberates toxic gas (it can react with acids to release chlorine gas).
- Skin corrosion/irritation: Causes severe skin burns and eye damage. Corrosive to the skin with severe effects due to the alkalinity of the hypochlorite ion.
- Eye damage/irritation: Causes serious eye damage.
- Respiratory/skin sensitisation: Tests conducted with other hypochlorite formulations have shown no evidence of potential allergic contact dermatitis [NICNAS].
- Germ cell mutagenicity: Based on the data available, Calcium hypochlorite is not considered to be genotoxic.
- Carcinogenicity: Hypochlorite salts are classified by the IARC Monographs as "Not classifiable as to its carcinogenicity to humans" (Group 3).
- Reproductive toxicity: No information available.
- STOT (single exposure): Inhalation exposure to Calcium hypochlorite is only possible if aerosols are formed, as the chemical is not volatile. Inhalation of chlorine fumes cause respiratory irritation and delayed pulmonary oedema.
- STOT (repeated exposure): Repeated inhalation exposure of rats and mice to chlorine gas caused increased incidence of nasal lesions; however, Calcium hypochlorite can only release gaseous chlorine at high concentrations upon mixing with strong acids [NICNAS].
- Aspiration toxicity: No information available.

Acute

Ingestion

Acute toxicity (Oral):
- LD50, Rat: 790 mg/kg bw. [NICNAS].

Carcinogen Category None

12. ECOLOGICAL INFORMATION

Ecotoxicity No information available.

Persistence/Degradability	No information available.
Mobility	This substance in poorly absorbed onto soils or sediments. Large volumes may penetrate soil and contaminate groundwater.
Environmental Fate	Very toxic to aquatic life - Avoid release to the environment.
Bioaccumulation Potential	No information available.
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of contents/container in accordance with local/regional/national regulations.
Special Precautions for Land Fill	Do not dispose together with organic materials, including Chlorinated Isocyanuric acid. Do not dispose any leaked or waste of of the product without appropriate treatment.

14. TRANSPORT INFORMATION

Land Transport (Australia)
ADG Code

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

Land Transport (Malaysia)
ADR Code

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

Land Transport (New Zealand)
NZS5433

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

Land Transport (United States of America)
US DOT

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
ERG	140 Oxidizers
UN Number	3487
Hazchem	1W
Pack Group	II
Special Provision	No Data Available

Sea Transport
IMDG Code

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	F-H, S-Q
Marine Pollutant	Yes

Air Transport
IATA DGR

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

No Data Available

General Information

Poisons Schedule (Aust)	Schedule 6

Environmental Protection Authority (New Zealand)

Hazardous Substances and New Organisms Amendment Act 2015

Approval Code	HSR006978

National/Regional Inventories

Australia (AIIC)	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

Related Product Codes	CAHYPO1850, CAHYPO3650, CAHYPO3700, CAHYPO3701, CAHYPO3702, CAHYPO3703, CAHYPO3704, CAHYPO3705, CAHYPO3706, CAHYPO6550, CAHYPO7025, CAHYPO7050, CAHYPO7051, CAHYPO7052, CAHYPO7053, CAHYPO7055, CAHYPO8010, CAHYPO8400, CAHYPO8402, CAHYPO8404, CAHYPO8410, CAHYPO8415, CAHYPO8420
Revision	3
Revision Date	17 May 2018
Reason for Issue	Update SDS
Key/Legend	**<** Less Than **>** Greater Than **AICS** Australian Inventory of Chemical Substances **atm** Atmosphere **CAS** Chemical Abstracts Service (Registry Number) **cm²** Square Centimetres **CO2** Carbon Dioxide **COD** Chemical Oxygen Demand **deg C (°C)** Degrees Celcius

EPA (New Zealand) Environmental Protection Authority of New Zealand
deg F (°F) Degrees Farenheit
g Grams
g/cm³ Grams per Cubic Centimetre
g/l Grams per Litre
HSNO Hazardous Substance and New Organism
IDLH Immediately Dangerous to Life and Health
immiscible Liquids are insoluable in each other.
inHg Inch of Mercury
inH2O Inch of Water
K Kelvin
kg Kilogram
kg/m³ Kilograms per Cubic Metre
lb Pound
LC50 LC stands for lethal concentration. LC50 is the concentration of a material in air which causes the death of 50% (one half) of a group of test animals. The material is inhaled over a set period of time, usually 1 or 4 hours.
LD50 LD stands for Lethal Dose. LD50 is the amount of a material, given all at once, which causes the death of 50% (one half) of a group of test animals.
ltr or **L** Litre
m³ Cubic Metre
mbar Millibar
mg Milligram
mg/24H Milligrams per 24 Hours
mg/kg Milligrams per Kilogram
mg/m³ Milligrams per Cubic Metre
Misc or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present.
mm Millimetre
mmH2O Millimetres of Water
mPa.s Millipascals per Second
N/A Not Applicable
NIOSH National Institute for Occupational Safety and Health
NOHSC National Occupational Heath and Safety Commission
OECD Organisation for Economic Co-operation and Development
Oz Ounce
PEL Permissible Exposure Limit
Pa Pascal
ppb Parts per Billion
ppm Parts per Million
ppm/2h Parts per Million per 2 Hours
ppm/6h Parts per Million per 6 Hours
psi Pounds per Square Inch
R Rankine
RCP Reciprocal Calculation Procedure
STEL Short Term Exposure Limit
TLV Threshold Limit Value
tne Tonne
TWA Time Weighted Average
ug/24H Micrograms per 24 Hours
UN United Nations
wt Weight