1. IDENTIFICATION

Product Name	**Zinc chloride**
Other Names	Butter of Zinc; Zinc dichloride; Zinc(II) chloride
Uses	Fluxes (soldering and welding); mordant in printing and dyeing textiles; mercerising cotton; sizing and weighing fabrics; carbonising woollen goods; corrosion inhibitors; absorbents and adsorbents; conductive agents; manufacturing other chemicals; agent in vulcanising rubber; tissue fixative in preserving anatomical specimens; manufacturing parchment paper, artificial silk, activated carbon, cold water glues, magnesia cements and cement for metals; electroplating agents; astringent (pharmaceutical).
Chemical Family	No Data Available
Chemical Formula	ZnCl2
Chemical Name	Zinc chloride
Product Description	No Data Available

Contact Details of the Supplier of this Safety Data Sheet

Organisation	Location	Telephone
Redox Pty Ltd	2 Swettenham Road Minto NSW 2566 Australia	+61-2-97333000
Redox Pty 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

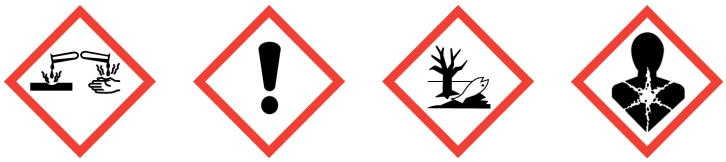
For emergencies only; DO NOT contact these companies for general product advice.

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			Acute Toxicity (Oral) - Category 4 Acute Toxicity (Inhalation) - Category 4 Skin Corrosion/Irritation - Category 1C Serious Eye Damage/Irritation - Category 1 Specific Target Organ Toxicity (Single Exposure) - Category 2 Specific Target Organ Toxicity (Repeated Exposure) - Category 2 Acute Hazard To The Aquatic Environment - Category 1 Long-term Hazard To The Aquatic Environment - Category 1
Pictograms			
Signal Word			Danger
Hazard Statements		**H302 + H332**	Harmful if swallowed or if inhaled.
		H314	Causes severe skin burns and eye damage.
		H371	May cause damage to organs.
		H373	May cause damage to organs through prolonged or repeated exposure.
		H410	Very toxic to aquatic life with long lasting effects.
Precautionary Statements	Prevention	**P260**	Do not breathe dusts or mists.
		P280	Wear protective gloves/protective clothing/eye protection/face protection.
		P273	Avoid release to the environment.
		P270	Do not eat, drink or smoke when using this product.
		P271	Use only outdoors or in a well-ventilated area.
	Response	**P303 + P361 + P353**	IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.
		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.
		P301 + P330 + P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
		P363	Wash contaminated clothing before reuse.
		P391	Collect spillage.
		P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
	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	Health Hazards	**6.1C**	Substances that are acutely toxic- Toxic
		6.1E	Substances that are acutely toxic –May be harmful, Aspiration hazard
		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
		9.3B	Substances that are ecotoxic to terrestrial vertebrates

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Zinc chloride	ZnCl2	7646-85-7	>=98 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed IF SWALLOWED: Rinse mouth, then drink plenty of water. Immediately call a Poison Centre or doctor/physician. Do not induce vomiting. Do not attempt to neutralise. Never give anything by mouth to an unconscious person. Keep victim calm and warm - Obtain immediate medical care.

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 rinsing for at least 15 minutes. Immediately call a Poison Centre or doctor/physician. Keep victim calm and warm - Obtain immediate medical care.

Skin IF ON SKIN (or hair): Remove contaminated clothing and shoes immediately. Rinse skin (and hair) with water/shower for at least 15 minutes. For minor skin contact, avoid spreading material onto unaffected skin. Immediately call a Poison Centre or doctor/physician. Keep victim calm and warm - Obtain immediate medical care. 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. Apply resuscitation if victim is not breathing - Do not use direct mouth-to-mouth method if victim ingested or inhaled the substance; use alternative respiratory method or proper respiratory device - Administer oxygen if breathing is difficult. Keep victim calm and warm - Obtain immediate medical care.

Advice to Doctor Treat symptomatically. Ensure that attending medical personnel are aware of the identity and nature of the product(s) involved, and take precautions to protect themselves.
- Inhalation of fume of this substance may cause lung oedema. The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation is therefore essential.

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. Cool containers with water spray until well after fire is out. Avoid getting water inside containers.

Flammability Conditions Non-combustible; Material does not burn.

Extinguishing Media Use dry chemical, Carbon dioxide, foam or water spray for extinction - Do not use water jets.

Fire and Explosion Hazard Contact with metals may evolve flammable hydrogen gas.

Fire or heat will produce irritating, toxic and/or corrosive gases, including Hydrogen chloride and Zinc oxide.

Hazardous Products of Combustion	
Special Fire Fighting Instructions	Contain runoff from fire control or dilution water - Runoff may be toxic and/or corrosive and pollute waterways.
Personal Protective Equipment	Liquid-tight chemical protective clothing (splash suit) in combination with self-contained breathing apparatus (SCBA) should be used.
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	2X

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation - Ventilate enclosed spaces before entering. ELIMINATE all ignition sources (no smoking, flares, sparks or flames). Do not touch or walk through spilled material. Avoid dust formation. Do not breathe dusts; Do not get in eyes, on skin or clothing.
Clean Up Procedures	Collect material and place it into suitable containers for later disposal (see SECTION 13). Do not get water inside containers.
Containment	Stop leak if safe to do so – Prevent entry into waterways, drains or confined areas.
Decontamination	No information available.
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.
Personal Precautionary Measures	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing (see SECTION 8).

7. HANDLING AND STORAGE

Handling	Safety showers and eyewash facilities should be provided within the immediate work area for emergency use. Use only outdoors or in a well-ventilated area. Handle in accordance with good industrial hygiene and safety practice. Avoid dust formation/dispersion. Do not breathe dusts or mists; Do not get in eyes, on skin or clothing. Wear protective gloves/protective clothing/eye protection/face protection (see SECTION 8).
Storage	Store in a cool, dry and well-ventilated place. Keep container tightly closed. Protect from moisture. Keep away from incompatible materials (strong bases, metal oxides, strong oxidising agents, potassium), food and feedstuffs. Store locked up.
Container	Keep only in the original container.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	- Safe Work Australia Exposure Standard (Zinc chloride, fume): TWA = 1 mg/m3; STEL = 2 mg/m3. - New Zealand WES (Zinc chloride, fume): TWA = 1 mg/m3; STEL = 2 mg/m3. - OSHA PEL/NIOSH REL (Zinc chloride, fume): TWA = 1 mg/m3; STEL = 2 mg/m3. - Immediately dangerous to life or health (IDLH) concentration: 50 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 as low as possible. 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 dusts/mist/aerosols, wear respiratory protection. Recommended: Full-face particulate respirator (P2/P3). If the respirator is the sole means of protection, use a full-face supplied air

	respirator. Use respirators and components tested and approved under appropriate government standards. Eye/face protection: Wear eye protection/face protection. Recommended: Face shield and safety glasses. Use equipment for eye protection tested and approved under appropriate government standards. Hand protection: Wear protective gloves. Recommended (full/splash contact): Nitrile rubber (Min. layer thickness: 0.11 mm; Break through time: 480 min). Skin/body protection: Wear protective clothing. Recommended: Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the hazardous substance(s) at the specific workplace.
Special Hazards Precaustions	No information available.
Work Hygienic Practices	Do not eat, drink or smoke when using this product. Wash hands before breaks and at the end of workday. Remove contaminated clothing and shoes immediately and wash before storage or reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Granular or crystalline
Odour	Odourless
Colour	White
pH	1 (6M aqueous solution)
Vapour Pressure	1,300 Pa (@ 508 °C)
Relative Vapour Density	No Data Available
Boiling Point	732 °C
Melting Point	283 °C
Freezing Point	283 °C
Solubility	432 g/100 mL water - Highly soluble 25°C
Specific Gravity	2.91
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	No Data Available
Density	No Data Available
Specific Heat	No Data Available
Molecular Weight	No Data Available
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	Hygroscopic; Deliquesces in contact with air. The solution in water is a medium-strong acid.
Potential for Dust Explosion	No information available.
Fast or Intensely Burning Characteristics	No information available.
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No information available.

Properties That May Initiate or Contribute to Fire Intensity	Non-combustible; Material does not burn.
Reactions That Release Gases or Vapours	The substance decomposes on heating producing toxic fumes of Hydrogen chloride and Zinc oxide.
Release of Invisible Flammable Vapours and Gases	Contact with metals may evolve flammable hydrogen gas.

10. STABILITY AND REACTIVITY

General Information	No information available.
Chemical Stability	Stable under recommended/normal use conditions.
Conditions to Avoid	Avoid dust formation/dispersion. Avoid overheating. Protect from moisture.
Materials to Avoid	Incompatible/reactive with strong bases, metal oxides, strong oxidising agents, potassium.
Hazardous Decomposition Products	The substance decomposes on heating producing toxic fumes of hydrogen chloride and zinc oxide.
Hazardous Polymerisation	Will not occur.

11. TOXICOLOGICAL INFORMATION

General Information

Acute toxicity: Harmful if swallowed (corrosive on ingestion) and if inhaled. Ingestion may cause abdominal pain, sore/burning sensation in the throat and chest, nausea, vomiting, shock or collapse. Inhalation may cause cough, sore throat, burning sensation, laboured breathing, shortness of breath. Symptoms may be delayed. Acute dermal toxicity is expected to be low.
Skin corrosion/irritation: The substance is corrosive to the skin. Causes severe skin burns, pain, redness.
Eye damage/irritation: The substance is corrosive to the eyes. Causes serious eye damage, pain, redness, deep burns.
Respiratory/skin sensitisation: Zinc chloride is unlikely to be a skin sensitiser (data from Zinc sulphate, heptahydrate).
Germ cell mutagenicity: Given the essential role of zinc in human physiology, it is unlikely to be genotoxic. Not mutagenic to germ cells (weight of evidence).
Carcinogenicity: No information available.
Reproductive toxicity: Does not show specific reproductive or developmental toxicity. While effects on fertility have been observed at very high doses of soluble zinc chemicals, the levels at which this occurs are unlikely to result from industrial use; Any reproductive and developmental effects were only observed secondary to maternal toxicity.
STOT - single exposure: May cause damage to organs. The aerosol is irritating to the respiratory tract. Inhalation of fume of this substance may cause lung oedema. Symptoms may be delayed.
STOT - repeated exposure: May cause damage to to organs through prolonged or repeated exposure. The substance may cause effects on the pancreas, if ingested. Acute exposure to high concentrations of zinc chloride fume can lead to Adult Respiratory Distress Syndrome (ARDS) leading to pulmonary fibrosis and death.
Aspiration toxicity: No information available.

Acute

Ingestion

Acute toxicity (Oral):
- LD50, Rats: 1,100 mg/kg bw.
- LD50, Mice: 1,260 mg/kg bw.

Inhalation

Acute toxicity (Inhalation):
- LC50, Rats: <4,095 mg/m3 Zinc chloride (10 min).
- LC50, Rats: <1,950 mg Zn/m3.

Carcinogen Category None

12. ECOLOGICAL INFORMATION

Ecotoxicity	Aquatic toxicity: - LC50, Crustace (Mysid shrimp): 0.880 mg/L (96 h).
Persistence/Degradability	No information available.
Mobility	No information available.

Environmental Fate	Very toxic to aquatic life with long lasting effects - Avoid release to the environment.
Bioaccumulation Potential	Low (BCF = 178).
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of contents/container in accordance with local/regional/national regulations. Offer surplus product and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.
Special Precautions for Land Fill	Contaminated packaging: Dispose of as unused product.

14. TRANSPORT INFORMATION

General Information	When transporting, avoid direct sunlight. Load to prevent container damage, corrosion, or leakage. Ensure to implement load shifting prevention. Do not transport with food and feed. Do not load heavy goods on top. Do not load on top of other dangerous goods or flammable dangerous goods. Do not load near other dangerous goods.

Land Transport (Australia)
ADG Code

Proper Shipping Name	ZINC CHLORIDE, ANHYDROUS
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	2331
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Land Transport (Malaysia)
ADR Code

Proper Shipping Name	ZINC CHLORIDE, ANHYDROUS
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	2331
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Land Transport (New Zealand)
NZS5433

Proper Shipping Name	ZINC CHLORIDE, ANHYDROUS
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	37 Toxic And/Or Corrosive Substances Non-Combustible
UN Number	2331
Hazchem	2X

Pack Group	III
Special Provision	No Data Available

Land Transport (United States of America)
US DOT

Proper Shipping Name	ZINC CHLORIDE, ANHYDROUS
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
ERG	154 Substances - Toxic and/or Corrosive (Non-Combustible)
UN Number	2331
Hazchem	2X
Pack Group	III
Special Provision	No Data Available

Sea Transport
IMDG Code

Proper Shipping Name	ZINC CHLORIDE, ANHYDROUS
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	2331
Hazchem	2X
Pack Group	III
Special Provision	No Data Available
EMS	F-A, S-B
Marine Pollutant	Yes

Air Transport
IATA DGR

Proper Shipping Name	ZINC CHLORIDE, ANHYDROUS
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	2331
Hazchem	2X
Pack Group	III
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)	Schedule 6

Environmental Protection Authority (New Zealand)
Hazardous Substances and New Organisms Amendment Act 2015

Approval Code	HSR001554

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

Related Product Codes	ZICHLO0300, ZICHLO0500, ZICHLO0700, ZICHLO0701, ZICHLO0702, ZICHLO0703, ZICHLO0704, ZICHLO0705, ZICHLO0706, ZICHLO0707, ZICHLO0708, ZICHLO0709, ZICHLO0710, ZICHLO0711, ZICHLO0712, ZICHLO0713, ZICHLO0714, ZICHLO0715, ZICHLO0716, ZICHLO0717, ZICHLO0718, ZICHLO0719, ZICHLO0720, ZICHLO0721, ZICHLO0722, ZICHLO0723, ZICHLO0724, ZICHLO1000, ZICHLO1001, ZICHLO1002, ZICHLO1003, ZICHLO1004, ZICHLO1005, ZICHLO1006, ZICHLO1007, ZICHLO1008, ZICHLO1009, ZICHLO1010, ZICHLO1100, ZICHLO1101, ZICHLO1200, ZICHLO1300, ZICHLO1500, ZICHLO1800, ZICHLO1850, ZICHLO1851, ZICHLO2000, ZICHLO2001, ZICHLO2500, ZICHLO2600, ZICHLO2601, ZICHLO2602, ZICHLO2800, ZICHLO3000, ZICHLO3300, ZICHLO3500, ZICHLO4000, ZICHLO4500, ZICHLO5000, ZICHLO5300, ZICHLO6800, ZICHLO9900
Revision	4
Revision Date	15 Jan 2015
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