SAFETY DATA SHEET
ALUMINIUM CHLORIDE
REVISION 5, DATE 06 SEP 22

1. IDENTIFICATION

Product Name	**Aluminium Chloride**
Other Names	Aluminium trichloride
Uses	Process regulator; Intermediate; Catalyst.
Chemical Family	No Data Available
Chemical Formula	AlCl3
Chemical Name	Aluminum chloride, anhydrous
Product Description	No Data Available

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)	Not Scheduled

Globally Harmonised System

Hazard Classification			Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)
Hazard Categories			Skin Corrosion/Irritation - Category 1B Serious Eye Damage/Irritation - Category 1
Pictograms			
Signal Word			Danger
Hazard Statements		**H314**	Causes severe skin burns and eye damage.
		AUH014	Reacts violently with water
		AUH071	Corrosive to the respiratory tract
Precautionary Statements	Prevention	**P260**	Do not breathe dusts or mists.
		P280	Wear protective gloves/protective clothing/eye protection/face protection.
	Response	**P303 + P361 + P353**	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
		P310	Immediately call a POISON CENTER or doctor.
		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.
		P304 + P340	IF INHALED: Remove victim to fresh air and keep 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	**8.1A**	Substances that are corrosive to metals
		8.2B	Substances that are corrosive to dermal tissue UN PGII
		8.3A	Substances that are corrosive to ocular tissue

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Aluminium chloride, anhydrous	AlCl3	7446-70-0	>=99 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	IF SWALLOWED: Rinse mouth, then drink 1 or 2 glasses of water. Do NOT induce vomiting. Do not attempt to neutralise! Immediately call a Poison Centre or doctor/physician for advice. Never give anything by mouth to an unconscious person.
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/ophthalmologist for advice. Can cause corneal burns - Urgently seek medical assistance!
Skin	IF ON SKIN (or hair): Remove and isolate contaminated clothing and shoes. Immediately flush skin and hair with running water for at least 15 minutes. For minor skin contact, avoid spreading material on unaffected skin. Immediately call a Poison Centre or doctor/physician for advice. Wash contaminated clothing and shoes before reuse. *For skin burns, cover with a clean, dry dressing until medical help is available.
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. Give artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult.
Advice to Doctor	Keep victim calm and warm. Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed. Show this material safety data sheet (SDS) to the doctor in attendance. *Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.
Medical Conditions Aggravated by Exposure	Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals.

5. FIRE FIGHTING MEASURES

General Measures	Move containers from fire area if you can do it without risk. Cool containers with water spray until well after fire is out. Do not get water inside containers!
Flammability Conditions	Non-combustible; Material does not burn, but may produce toxic and/or corrosive fumes on heating.
Extinguishing Media	If material is involved in a fire, use dry chemical or Carbon dioxide (CO2) for extinction. When material is not involved in fire, do not use water on material itself. *Large Fire: Flood fire area with large quantities of water, while knocking down vapours with water fog. If insufficient water supply: knock down vapours only.
Fire and Explosion Hazard	Risk of violent reaction or explosion! Substance will react with water, releasing corrosive and/or toxic gases and runoff. Flammable/toxic gases may accumulate in confined areas. Contact with metals may evolve flammable hydrogen gas. Containers may explode when heated or if contaminated with water. *Reaction with water may generate much heat that will increase the concentration of fumes in the air.
Hazardous Products of Combustion	Fire will produce irritating, corrosive and/or toxic gases, including Hydrogen chloride, Aluminium oxide.
Special Fire Fighting Instructions	Contain runoff from fire control or dilution water - Runoff may cause pollution.
Personal Protective Equipment	Wear positive pressure self-contained breathing apparatus (SCBA). Wear chemical protective clothing - It may provide little or no thermal protection. Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
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	4W

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation - Ventilate enclosed spaces before entering. ELIMINATE all ignition sources. Do not touch or walk through spilled material. Avoid dust formation. Do not breathe dusts or vapours and prevent contact with eyes, skin and clothing.
Clean Up Procedures	Use clean, non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal (see SECTION 8). *Do not get water inside containers!
Containment	Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements or confined areas. Cover with DRY earth, DRY sand or other non-combustible material followed with plastic sheet to minimise spreading or contact with rain. *Use water spray to reduce vapours; do not put water directly on leak, spill area or inside container.
Decontamination	Do NOT flush to drains or waterways. Neutralisation of the product is required before discharging.
Environmental Precautionary Measures	Spillages and decontamination runoff should be prevented from entering drains and watercourses. If environmental contamination has occurred, advise local emergency services.
Evacuation Criteria	Spill or leak area should be isolated immediately. Evacuate the danger area. Keep unauthorised personnel away. Keep upwind and to higher ground. *Large spill: Immediately contact Police or Fire Brigade; Consider downwind evacuation.
Personal Precautionary Measures	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing (see SECTION 8). Fully encapsulating, vapour-protective clothing should be worn for spills and leaks with no fire. *Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.

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 formation of dust and aerosols. Do not breathe dusts/mist/aerosols and prevent contact with eyes, skin and clothing. Do not ingest. Wear protective gloves/protective clothing/eye protection/face protection (see SECTION 8). Handle and open container with care. Containers should be carefully vented before being opened. *NEVER pour water into this substance; when dissolving or diluting always add it slowly to the water.
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight and without drain or sewer access. Keep container tightly closed - Check regularly for spills. WATER REACTIVE: Keep dry - Protect from moisture. Keep away from food/feedstuffs and incompatible materials (see SECTION 10). Store locked up.
Container	Keep in the original container.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	No specific exposure standards are available for Aluminium chloride. For Aluminium, soluble salts (as Al): - Safe Work Australia Exposure Standard: TWA = 2 mg/m3. - New Zealand Workplace Exposure Standard [Next review 2022]: TWA = 5 mg/m3. DECOMPOSITION PRODUCT: Hydrogen chloride (HCl): - Safe Work Australia Exposure Standard: TWA = 5 ppm (7.5 mg/m3) Peak limitation. - New Zealand Workplace Exposure Standard [Next review 2023]: Ceiling = 5 ppm (7.5 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 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: Wear respiratory protection in case of inadequate ventilation or if an inhalation risk exists. Recommended: Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator, type ABEK-P3 respirator cartridges as a backup to engineering controls. 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 (refer to AS/NZS 1715 & 1716). - Eye/face protection: Wear appropriate eye protection to prevent eye contact. Recommended: Face shield and safety glasses. Use equipment for eye protection tested and approved under appropriate government standards. - Hand protection: Wear protective gloves. Recommended: PVC (0.7 mm thickness) or Nitrile rubber (0.4 mm thickness). - Skin/body protection: Wear appropriate personal protective clothing to prevent skin contact. Recommended: Acid-resistant protective clothing.
Special Hazards Precaustions	Reacts violently and exothermically with water/moist air to form Hydrochloric acid - Reaction with water may generate heat which will increase the concentration of fumes in the air. Vapours may accumulate in confined areas.
Work Hygienic Practices	Do not eat, drink or smoke when using this product. Wash hands before breaks and at the end of the work day. Take off immediately all contaminated clothing. Wash contaminated clothing before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Powder or granule
Odour	Sharp, acidic, pungent
Colour	White to grey or yellowish
pH	2.4 (100 g/l)
Vapour Pressure	<1 mbar (@ 20 °C)
Relative Vapour Density	No Data Available
Boiling Point	No Data Available
Melting Point	190 °C
Freezing Point	No Data Available
Solubility	WATER REACTIVE - 450 g/l in water 20°C
Specific Gravity	2.44
Flash Point	No Data Available
Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	1,200 kg/m3
Corrosion Rate	No Data Available
Decomposition Temperature	No Data Available
Density	2.44 g/cm3 [Literature data]
Specific Heat	No Data Available
Molecular Weight	133.34 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	Sublimation temperature: 181.2 °C (1,013.25 hPa) [Literature data].
Potential for Dust Explosion	No information available.

Fast or Intensely Burning Characteristics	Risk of violent reaction or explosion!
Flame Propagation or Burning Rate of Solid Materials	No information available.
Non-Flammables That Could Contribute Unusual Hazards to a Fire	Will react violently with water/hydrous extinguishing agents, releasing flammable, toxic and/or corrosive gases.
Properties That May Initiate or Contribute to Fire Intensity	Non-combustible; Material does not burn, but may produce toxic and/or corrosive fumes on heating.
Reactions That Release Gases or Vapours	Heating or contamination will produce flammable, toxic and/or corrosive gases, including Hydrogen chloride, Aluminium oxides.
Release of Invisible Flammable Vapours and Gases	If contaminated with moisture, acid will be formed that may react with the (steel) drum resulting in formation of flammable hydrogen gas.

10. STABILITY AND REACTIVITY

General Information	WATER REACTIVE: Reacts violently with water, releasing toxic and corrosive hydrogen chloride, with sufficient heat and pressure generated to rupture containers.
Chemical Stability	Stable if kept dry and protected from atmospheric moisture. *May decompose on prolonged storage creating a build-up of pressure (possibly due to slow absorption of moisture). Prolonged storage in closed containers has resulted in apparently spontaneous decomposition and occasionally explosion upon opening.
Conditions to Avoid	Avoid dust formation. Protect from water and (atmospheric) moisture/humidity.
Materials to Avoid	Incompatible/reactive with water, alkenes, alcohols, alkali metals, alkaline earth metals, ethylene oxide, halogen oxides, oxidising agents, organic nitro compounds, phenols, bases. Corrodes metals in the presence of moisture.
Hazardous Decomposition Products	Heating or contamination may produce flammable, toxic and/or corrosive gases, including Hydrogen chloride (HCl), Aluminium oxides.
Hazardous Polymerisation	No information available.

11. TOXICOLOGICAL INFORMATION

General Information	- Acute toxicity: Low acute oral toxicity. Corrosive on ingestion! May cause abdominal pain, burning sensation, chemical burns to the gastrointestinal tract, shock or collapse. - Skin corrosion/irritation: Corrosive! May cause severe skin burns and eye damage. - Eye damage/irritation: Corrosive! Causes serious eye damage. May cause deep (corneal) burns and permanent eye damage. - Respiratory/skin sensitisation: No evidence of skin sensitisation. Skin sensitising effects were not observed in animal studies. Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals. - Germ cell mutagenicity: Not considered as genotoxic/mutagenic. - Carcinogenicity: Not considered as carcinogenic. - Reproductive toxicity: Fetotoxic and embryotoxic effects have been observed in animal studies. Causes developmental effects in animals at high, maternally toxic doses. - STOT (single exposure): Corrosive to the respiratory tract. May cause burning sensation, cough, laboured breathing, shortness of breath, sore throat. - STOT (repeated exposure): The substance may cause damage to the central nervous system after repeated ingestion of high doses. The substance may cause damage to the lungs after repeated inhalation. Numerous studies have found impaired lung function in a variety of aluminium workers. Other observed effects include occupational asthma and pulmonary fibrosis (human studies); neurotoxicity and neurodevelopmental toxicity (animal studies). - Aspiration toxicity: No information available.

Acute

Ingestion	Acute toxicity (Oral): - LD50, Rat: 3,450 (male) - 3,470 mg/kg (female) [Supplier's SDS].

Carcinogen Category	None

12. ECOLOGICAL INFORMATION

Ecotoxicity	Aquatic toxicity: - LC50, Fish (Oncorhynchus mykiss): 36.6 mg/l (96 h) [Supplier's SDS]. - EC50, Crustacea (Daphnia magna): 7.4 mg/l (48 h) (static) [Literature data; Supplier's SDS]. - EC50, Crustacea (Daphnia magna): 27.3 mg/l (48 h) (static) [Literature data; Supplier's SDS]. - EC50, Algae/aquatic plants (Selenastrum capricornutum): 2.8 mg/l (96 h) (static) [Literature data; Supplier's SDS]. - NOEC, Fish (Oncorhynchus mykiss): 0.25 mg/l (45 d) [Literature data; Supplier's SDS]. Microorganisms/Effect on activated sludge: - EC10: >1,000 mg/l (180 min.) (aerobic) [OECD Guideline 209; Supplier's SDS].
Persistence/Degradability	Biodegradation testing is not applicable; Inorganic substance. *Aluminium chloride decomposes rapidly to hydrogen chloride and/or hydrochloric acid gas and aluminium hydroxide in aqueous environments.
Mobility	No information available.
Environmental Fate	Acutely toxic for aquatic organisms, effects depends on the pH-value. Avoid release to the environment.
Bioaccumulation Potential	Accumulation in organisms is not expected.
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of contents/container as hazardous (reactive) waste and in accordance with local/regional/national regulations.
Special Precautions for Land Fill	No information available.

14. TRANSPORT INFORMATION

Land Transport (Australia)

ADG Code

Proper Shipping Name	ALUMINIUM CHLORIDE, ANHYDROUS
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	40 Toxic And/Or Corrosive Substances Non-Combustible - Water Reactive
UN Number	1726
Hazchem	4W
Pack Group	II
Special Provision	No Data Available

Land Transport (India)

Proper Shipping Name	ALUMINIUM CHLORIDE, ANHYDROUS
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available

EPG	40 Toxic And/Or Corrosive Substances Non-Combustible - Water Reactive
UN Number	1726
Hazchem	4W
Pack Group	II
Special Provision	No Data Available

Land Transport (Malaysia)
ADR Code

Proper Shipping Name	ALUMINIUM CHLORIDE, ANHYDROUS
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	40 Toxic And/Or Corrosive Substances Non-Combustible - Water Reactive
UN Number	1726
Hazchem	4W
Pack Group	II
Special Provision	No Data Available

Land Transport (New Zealand)
NZS5433

Proper Shipping Name	ALUMINIUM CHLORIDE, ANHYDROUS
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
EPG	40 Toxic And/Or Corrosive Substances Non-Combustible - Water Reactive
UN Number	1726
Hazchem	4W
Pack Group	II
Special Provision	No Data Available

Land Transport (United States of America)
US DOT

Proper Shipping Name	ALUMINIUM CHLORIDE, ANHYDROUS
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
ERG	137 Substances - Water-Reactive - Corrosive
UN Number	1726
Hazchem	4W
Pack Group	II
Special Provision	No Data Available

Sea Transport
IMDG Code

Proper Shipping Name	ALUMINIUM CHLORIDE, ANHYDROUS
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	1726
Hazchem	4W
Pack Group	II
Special Provision	No Data Available

EMS	F-A, S-B
Marine Pollutant	No

Air Transport
IATA DGR

Proper Shipping Name	ALUMINIUM CHLORIDE, ANHYDROUS
Class	8 Corrosive Substances
Subsidiary Risk(s)	No Data Available
UN Number	1726
Hazchem	4W
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)	Not Scheduled

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

Approval Code	HSR002491 HSR003954 (Revoked)

National/Regional Inventories

Australia (AIIC)	Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	231-208-1
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	ALUCHL1000, ALUCHL1001, ALUCHL1002, ALUCHL1003, ALUCHL1004, ALUCHL1005, ALUCHL1006, ALUCHL1007, ALUCHL2000, ALUCHL3000, ALUCHL4000, ALUCHL4001, ALUCHL4002, ALUCHL4100, ALUCHL5000, ALUCHL5100, ALUCHL5200, ALUCHL5205, ALUCHL5206, ALUCHL5250, ALUCHL9900
Revision	5
Revision Date	06 Sep 2022
Reason for Issue	Updated SDS
Key/Legend	< Less Than > Greater Than **AICS** Australian Inventory of Chemical Substances **atm** Atmosphere **CAS** Chemical Abstracts Service (Registry Number) **cm^2** 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/cm^3** 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/m^3** 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 **m^3** Cubic Metre **mbar** Millibar **mg** Milligram **mg/24H** Milligrams per 24 Hours **mg/kg** Milligrams per Kilogram **mg/m^3** 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