SAFETY DATA SHEET
ALUMINIUM SULPHATE
REVISION 4, DATE 01 APR 2020

1. IDENTIFICATION

Product Name	**Aluminium Sulphate**
Other Names	Aluminium sulfate, hydrate [CAS#17927-65-0]; Aluminium sulphate, hexadecahydrate [CAS#16828-11-8]; Aluminium sulphate, octadecahydrate [CAS#7784-31-8]; Aluminium sulphate, tetradecahydrate [CAS#16828-12-9]
Uses	Water purification; Sewage treatment; Deodoriser and decolouring in petroleum refinery processes; Water proofing agent for concrete; Sizing paper and pH control; Clarifying agent for fats and oil.
Chemical Family	No Data Available
Chemical Formula	Al2(SO4)3
Chemical Name	Aluminium sulfate
Product Description	Inorganic salt.

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 Serious Eye Damage/Irritation - Category 2A

Pictograms

Signal Word Warning

Hazard Statements		**H319**	Causes serious eye irritation.
Precautionary Statements	Prevention	**P280**	Wear eye protection/face protection.
	Response	**P305 + P351 + P338**	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P337 + P313	If eye irritation persists: Get medical advice.

National Transport Commission (Australia)

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

Dangerous Goods Classification NOT Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road & Rail (ADG Code)

Safe Work Australia

National Guide for Classifying Hazardous Chemicals under the Model WHS Regulations

Hazard Classification Hazardous according to the criteria of Safe Work Australia under Model WHS Regulations

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Aluminium sulphate	Al2(SO4)3	10043-01-3	<=100 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed IF SWALLOWED: Rinse mouth, then drink 1 - 2 glasses of water. Do NOT induce vomiting. Get immediate medical advice/attention. 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. Get immediate medical advice/attention.

Skin	IF ON SKIN: Immediately wash with plenty of soap and water or flush skin with running water for at least 15 minutes. Take off contaminated clothing and wash before reuse. If skin irritation occurs, get medical advice/attention.
Inhaled	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a Poison Centre or doctor/physician if you feel unwell. Apply resuscitation if victim is not breathing - Administer oxygen if breathing is difficult.
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.
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 - The solid may corrode metals in presence of moisture.
Flammability Conditions	Non-combustible. Material itself does not burn.
Extinguishing Media	If material is involved in a fire, use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Fire and Explosion Hazard	Gives off irritating or toxic fumes (or gases) in a fire.
Hazardous Products of Combustion	Decomposes on heating, emitting toxic fumes, including Sulphur oxides and Aluminium oxides.
Special Fire Fighting Instructions	Prevent fire extinguishing water from contaminating surface water or the ground water system.
Personal Protective Equipment	Wear self-contained breathing apparatus (SCBA) and chemical splash suit. SCBA and structural firefighter's uniform may 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	No Data Available

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation. Do not touch or walk through spilled material. Avoid breathing dust and contact with eyes, skin and clothing.
Clean Up Procedures	Sweep up and shovel into suitable, cleand and dry, labelled containers for disposal (see SECTION 13). Take up dry. Prevent dispersion of dust!
Containment	Stop leak if safe to do so - Prevent entry into waterways, drains or confined areas. Cover with plastic sheet to prevent spreading or contact with rain.
Decontamination	Clean contaminated surface thoroughly.
Environmental Precautionary Measures	Prevent entry into waterways and drains.
Evacuation Criteria	Spill or leak area should be isolated immediately. Keep unauthorised personnel away.
Personal Precautionary Measures	Use personal protective equipment as required, incl. particulate filter respirator adapted to the airborne concentration of the substance (see SECTION 8).

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 dust. Avoid breathing dust/spray mist and contact with eyes, skin and clothing. Do not ingest. Use personal protective equipment as required (see SECTION 8).
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep container tightly closed when not in use. Protect from moisture. Keep away from heat and sources of ignition - No smoking. Keep away from foodstuffs 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 this product. 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
Exposure Limits	No Data Available
Biological Limits	No information available.
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. Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.
Personal Protection Equipment	- Respiratory protection: Wear respiratory protection under conditions where exposure to the substance is apparent (e.g. generation of high concentration of dust (dust clouds), inadequate ventilation, development of respiratory tract irritation) and engineering controls are not feasible. Recommended: Dust mask or respirator with dust filter (refer to AS/NZS 1715 & 1716). - Eye/face protection: Wear appropriate eye protection to prevent eye contact. Recommended: Goggles or Safety glasses with side-shields; and face shield (when eye/face contact is possible due to splashing or spraying of material). - Hand protection: Wear protective gloves. Recommended: Appropriate chemical-resistant gloves, e.g. Nitrile rubber. - Skin/body protection: Wear appropriate personal protective clothing to avoid skin contact. Recommended: Long sleeved clothing; Chemical resistant apron. Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substance handled.
Special Hazards Precaustions	No information available.
Work Hygienic Practices	Do not eat, drink or smoke when using this product. Wash hands after working with substance. Take off contaminated clothing and wash before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Powder or granules, flake
Odour	Odourless
Colour	White to brownish
pH	>3 (1% sol. @ 27 °C)
Vapour Pressure	No Data Available
Relative Vapour Density	No Data Available
Boiling Point	No Data Available
Melting Point	770 °C (decomposes)
Freezing Point	No Data Available
Solubility	Soluble in water (87 g/100 cc) 27°C
Specific Gravity	No Data Available
Flash Point	No Data Available

Auto Ignition Temp	No Data Available
Evaporation Rate	No Data Available
Bulk Density	920 kg/m3 (Powder)
Corrosion Rate	No Data Available
Decomposition Temperature	770 °C
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 - Absorbs moisture/water from surrounding air.
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	Dissolves in water with evolution of heat; Creates acidic solutions.
Properties That May Initiate or Contribute to Fire Intensity	Non-combustible; Material itself does not burn.
Reactions That Release Gases or Vapours	Decomposes on heating, emitting toxic fumes, including Sulphur oxides and Aluminium oxides.
Release of Invisible Flammable Vapours and Gases	No information available.

10. STABILITY AND REACTIVITY

General Information	Releases water of crystallization when heated. Aqueous solutions of ALUMINUM SULFATE are acidic. The solid may corrode metals in presence of moisture.
Chemical Stability	Stable under recommended storage conditions.
Conditions to Avoid	Avoid generating dust. Avoid exposure to air/moisture.
Materials to Avoid	Incompatible/reactive with strong bases, chlorites, hypochlorites, carbides, water, metals. Attacks many metals in the presence of water!
Hazardous Decomposition Products	Decomposes on heating, emitting toxic and corrosive fumes, including Sulphur oxides and Aluminium oxides.
Hazardous Polymerisation	Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

General Information

- Acute toxicity: Low toxicity. Swallowing may cause irritations of mucous membranes in the mouth, pharynx, esophagus and gastrointestinal tract.
- Skin corrosion/irritation: Slight irritation (Rabbit) [OECD Guideline 404].
- Eye damage/irritation: Causes serious eye irritation [NICNAS assessment Aluminum sulfates (single and double salts)].
- Respiratory/skin sensitisation: The available data do not provide any evidence of skin sensitisation [NICNAS].
- Germ cell mutagenicity: The weight of evidence does not support classification for genotoxicity [NICNAS].
- Carcinogenicity: The available data do not support classification as a carcinogen [NICNAS].
- Reproductive toxicity: Neurodevelopmental effects have been observed in rats and mice at doses of 103 – 330 mg Al/kg bw/day, equivalent to 652 - 2090 mg Aluminium sulfate (CAS No. 10043-01-3).
- STOT (single exposure): The substance or mixture is not classified as specific target organ toxicant, single exposure. Inhalation of dust in high concentration may cause irritation of respiratory system.
- STOT (repeated exposure): The substance or mixture is not classified as specific target organ toxicant, repeated exposure. Results from human and animal studies suggest that the respiratory tract, particularly the lung, is a sensitive target of airborne aluminium toxicity (soluble and insoluble forms). The lung effects observed in humans and animals are suggestive of dust overload. In addition, neurotoxicity is a well-documented effect of aluminium in orally-exposed mice and rats. Although the neurotoxicity of aluminium has not been established in humans with normal renal function, the available data establish that the human nervous system is susceptible to aluminium toxicity [NICNAS].
- Aspiration toxicity: Based on available data the classification criteria are not met.

Acute

Ingestion

Acute toxicity (Oral):
- LD50, Rat: >2,000 mg/kg

Carcinogen Category None

12. ECOLOGICAL INFORMATION

Ecotoxicity

Toxicity to fish:
- LC50, Pimephales promelas (fathead minnow): 36.1 mg/l (96 h).

Persistence/Degradability No information available.

Mobility No information available.

Environmental Fate Prevent entry into waterways and drains.

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. DO NOT flush to surface water or sanitary sewer system.

Special Precautions for Land Fill No information available.

14. TRANSPORT INFORMATION

Land Transport (Australia)

ADG Code

Proper Shipping Name Aluminium sulphate

Class No Data Available

Subsidiary Risk(s) No Data Available

	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (Fiji)

Proper Shipping Name	Aluminium sulphate
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (Indonesia)

Proper Shipping Name	Aluminium sulphate
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (Malaysia)
ADR Code

Proper Shipping Name	Aluminium sulphate
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (New Zealand)
NZS5433

Proper Shipping Name	Aluminium sulphate
Class	No Data Available
Subsidiary Risk(s)	No Data Available

	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (Papua New Guinea)

Proper Shipping Name	Aluminium sulphate
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Land Transport (United States of America)
US DOT

Proper Shipping Name	Aluminium sulphate
Class	No Data Available
Subsidiary Risk(s)	No Data Available
	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for LAND transport.

Sea Transport
IMDG Code

Proper Shipping Name	Aluminium sulphate
Class	No Data Available
Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
EMS	No Data Available
Marine Pollutant	No
Comments	NON-DANGEROUS GOODS: Not regulated for SEA transport.

Air Transport
IATA DGR

Proper Shipping Name	Aluminium sulphate
Class	No Data Available

Subsidiary Risk(s)	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	No Data Available
Comments	NON-DANGEROUS GOODS: Not regulated for AIR transport.

National Transport Commission (Australia)

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

Dangerous Goods Classification	NOT 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	HSR002503 - Additives Process Chemicals and Raw Materials (Subsidiary Hazard) Group Standard 2020

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	ALSULP0500, ALSULP1000, ALSULP1001, ALSULP1002, ALSULP1003, ALSULP1004, ALSULP1005, ALSULP1006, ALSULP1007, ALSULP1008, ALSULP1009, ALSULP1010, ALSULP1011, ALSULP1012, ALSULP1013, ALSULP1014, ALSULP1015, ALSULP1016, ALSULP1100, ALSULP1200, ALSULP1250, ALSULP1251, ALSULP1300, ALSULP1400, ALSULP1500, ALSULP1600, ALSULP1700, ALSULP1800, ALSULP1801, ALSULP1802, ALSULP1803, ALSULP1804, ALSULP1805, ALSULP1806, ALSULP1900, ALSULP2000, ALSULP2040, ALSULP2100, ALSULP2200, ALSULP2201, ALSULP2202, ALSULP2203, ALSULP2205, ALSULP2209, ALSULP2210, ALSULP2211, ALSULP2212, ALSULP2213, ALSULP2214, ALSULP2215, ALSULP2300, ALSULP2310, ALSULP2400, ALSULP2410, ALSULP2411, ALSULP2500, ALSULP2501, ALSULP2710, ALSULP3000, ALSULP3100, ALSULP3200, ALSULP3500, ALSULP3550, ALSULP3700, ALSULP3701, ALSULP3702, ALSULP3710, ALSULP3711, ALSULP4000, ALSULP4900, ALSULP5000, ALSULP5100, ALSULP5101, ALSULP5105, ALSULP5110, ALSULP5200, ALSULP5201, ALSULP5205, ALSULP5300, ALSULP5400, ALSULP5500, ALSULP5600, ALSULP5700, ALSULP6000, ALSULP6500, ALSULP7000, ALSULP7100, ALSULP8001, ALSULP8002, ALSULP8005, ALSULP8020, ALSULP8030, ALSULP8031, ALSULP8040, ALSULP8881, ALSULP9001, ALSULP9010, ALSULP9011, ALSULP9016, ALSULP9200, ALSULP9310, ALSULP9311
Revision	4
Revision Date	01 Apr 2020
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