1. IDENTIFICATION

Product Name	**Oxalic acid, dihydrate**
Other Names	No Data Available
Uses	There are no uses advised against.
Chemical Family	No Data Available
Chemical Formula	C2H2O4.2H2O
Chemical Name	Ethanedioic acid, dihydrate
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 (Dermal) - Category 4	
		Serious Eye Damage/Irritation - Category 1	
Pictograms			
Signal Word		Danger	
Hazard Statements		**H302**	Harmful if swallowed.
		H312	Harmful in contact with skin.
		H318	Causes serious eye damage.
Precautionary Statements	Prevention	**P270**	Do not eat, drink or smoke when using this product.
		P280	Wear protective gloves/protective clothing/eye protection/face protection.
	Response	**P312**	Call a POISON CENTER or doctor/physician if you feel unwell.
		P330	Rinse mouth.
		P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
		P363	Wash contaminated clothing before reuse.
		P305 + P351 + P338 + P310	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTRE/doctor.
	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	NOT 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	**6.1D**	Substances that are acutely toxic - Harmful
		8.3A	Substances that are corrosive to ocular tissue
	Environmental Hazards	**9.3B**	Substances that are ecotoxic to terrestrial vertebrates

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Oxalic acid, dihydrate	C2H2O4.2H2O	6153-56-6	<=100 %

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure

Swallowed	IF SWALLOWED: Rinse mouth, then drink plenty of water. Do NOT induce vomiting. 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 continuously with running water for several minutes, holding eyelids open and occasionally lifting the upper and lower lids. Immediately call a Poison Centre or doctor/physician for advice. Remove contact lenses if present and easy to do. Continue flushing until advised to stop by a Poison Information Centre or a doctor, or for at least 15 minutes.
Skin	IF ON SKIN (or hair): Remove contaminated clothing and shoes immediately. Flush skin and hair with running water for at least 15 minutes; Wash with plenty of soap and water. Get medical advice/attention. 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. Get medical advice/attention. 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.
Flammability Conditions	Combustible material; May burn but does not ignite readily.
Extinguishing Media	Use dry chemical, Carbon dioxide (CO2), foam or water spray for extinction. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Fire and Explosion Hazard	Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
Hazardous Products of Combustion	Fire or heat will produce irritating, toxic and/or corrosive gases, including Carbon monoxide, Carbon dioxide, Formic aid.
Special Fire Fighting Instructions	Contain runoff from fire control or dilution water - Runoff may pollute waterways.
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 self-ignition below 400 °C
Hazchem Code	No Data Available

6. ACCIDENTAL RELEASE MEASURES

General Response Procedure	Ensure adequate ventilation. ELIMINATE all ignition sources. Do not touch or walk through spilled material. Avoid generating dust. Avoid breathing dust and contact with eyes, skin and clothing.
Clean Up Procedures	Collect material (sweep or vacuum up) and place into suitable containers for later disposal (see SECTION 13). Avoid dispersal of dust in the air (i.e. clearing dusty surfaces with compressed air). Non-sparking tools should be used.
Containment	Stop leak if safe to do so – Prevent entry into waterways, drains or confined areas. Prevent dust cloud.
Decontamination	Wash away remainder with plenty of water.
Environmental Precautionary Measures	Prevent entry into drains and waterways.
Evacuation Criteria	Spill or leak area should be isolated immediately. Keep unauthorised personnel away.
Personal Precautionary Measures	Use personal protective equipment as required (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. Minimise dust generation and accumulation. Avoid breathing dust and contact with eyes, skin and clothing. Do not ingest. Use personal protective equipment as required (see SECTION 8). Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres.
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep container tightly closed. Avoid exposure to air and moisture (hygroscopic). Keep away from heat and sources of ignition - No smoking. Keep away from food/feedstuffs and incompatible materials (see SECTION 10).
Container	Keep in the original container.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	No specific exposure standards are available for this product. For Oxalic acid (CAS No. 144-62-7): - Safe Work Australia (SWA) Exposure Standard: TWA = 1 mg/m3; STEL = 2 mg/m3. - New Zealand Workplace Exposure Standard (WES): TWA = 1 mg/m3; STEL = 2 mg/m3. - NIOSH REL: TWA = 1 mg/m3; ST = 2 mg/m3. - OSHA PEL: TWA = 1 mg/m3. - Immediately dangerous to life or health (IDLH) concentration: 500 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 inadequate ventilation, wear respiratory protection. Recommended: Organic vapour/particulate (filter type A/P) respirator (refer to AS/NZS 1715 & 1716). - Eye/face protection: Wear appropriate eye protection to prevent eye contact. Recommended: Face shield and safety glasses. - Hand protection: Wear protective gloves. Recommended: Impervious gloves, e.g. Nitrile, neoprene, natural rubber, polyvinyl. - Skin/body protection: Wear appropriate personal protective clothing to prevent skin contact. Recommended: Standard work clothes, long pants, long sleeves, coveralls, safety shoes.
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 contaminated clothing and wash before reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Crystals or powder
Odour	Odourless
Colour	Uncoloured or white
pH	~0.7 (50 g/l)
Vapour Pressure	0.0312 Pa (@ 25 °C)
Relative Vapour Density	No Data Available
Boiling Point	>160 °C (Sublimes)
Melting Point	>160 °C (Sublimes)
Freezing Point	No Data Available
Solubility	108 g/L in water 25°C
Specific Gravity	0.813 [EU A.3 method]

Flash Point	No Data Available
Auto Ignition Temp	No self-ignition below 400 °C
Evaporation Rate	No Data Available
Bulk Density	No Data Available
Corrosion Rate	No Data Available
Decomposition Temperature	>160 °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	-1.7 (23 °C) [OECD Guideline 107]
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	Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
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	Combustible material; May burn but does not ignite readily.
Reactions That Release Gases or Vapours	Fire or heat will produce irritating, toxic and/or corrosive gases, including Carbon monoxide, Carbon dioxide, Formic acid.
Release of Invisible Flammable Vapours and Gases	No information available.

10. STABILITY AND REACTIVITY

General Information	The substance in solution is a medium-strong acid. Reacts violently with oxidants causing fire and explosion hazard. Reacts with silver compounds, forming explosive silver oxalate. Attacks some forms of plastic.
Chemical Stability	Stable under normal conditions of use and storage.
Conditions to Avoid	Avoid generating dust. Avoid exposure to air and moisture. Keep away from heat and sources of ignition.
Materials to Avoid	Incompatible/reactive with alkalis, alkaline solutions, ammonia, acid chlorides, halogenates, oxidising agents, metals.
Hazardous Decomposition Products	Fire or heat will produce irritating, toxic and/or corrosive gases, including Carbon monoxide, Carbon dioxide, Formic aid.
Hazardous Polymerisation	Hazardous polymerisation will not occur.

11. TOXICOLOGICAL INFORMATION

General Information	- Acute toxicity: Harmful if swallowed and in contact with skin. Corrosive on ingestion; May cause effects on Calcium balance. Signs of toxicity include nausea and vomiting, headaches, abdominal pain, diarrhoea, bloody stool, numbness and tingling of fingers and toes, muscular irritability, tetany, convulsions, shock, cardiac irregularities and

circulatory collapse [NICNAS].
- Skin corrosion/irritation: Not irritating to skin. No skin irritation (Rabbit) [OECD TG 404].
- Eye damage/irritation: Causes serious eye damage. Irreversible effects on the eye (Rabbit) [OECD TG 405].
- Respiratory/skin sensitisation: Oxalic acid is not a skin sensitiser [OECD Guideline 429].
- Germ cell mutagenicity: Not considered to be genotoxic [NICNAS].
- Carcinogenicity: No evidence of carcinogenicity [NICNAS].
- Reproductive toxicity: Does not show specific reproductive or developmental toxicity [NICNAS].
- STOT (single exposure): Corrosion and irritant effects of the mouth and digestive tract, skin, eyes and respiratory tract have been reported following exposure to either the solid or concentrated solutions of oxalic acid [NICNAS].
- STOT (repeated exposure): May cause harmful cumulative effects (reduced thyroid function, renal toxicity, kidney damage/stone formation) following repeated oral exposure.
- Aspiration toxicity: No information available.

Acute

Ingestion Acute toxicity (Oral):
- LD50, Rat: >375 mg/kg bw. [Supplier's SDS].

Other Acute toxicity (Dermal):
- LD50, Rabbit: >20,000 mg/kg bw. [Supplier's SDS].

Carcinogen Category None

12. ECOLOGICAL INFORMATION

Ecotoxicity Aquatic toxicity:
- LC50, Fish (Leuciscus idus): 160 mg/l (96 h) [Supplier's SDS].
- EC50, Crustacea (Daphnia magna): 162.2 mg/l (48 h) [Supplier's SDS].

Persistence/Degradability Readily biodegradable.

Mobility No information available.

Environmental Fate Prevent entry into drains and waterways.

Bioaccumulation Potential No information available.

Environmental Impact No Data Available

13. DISPOSAL CONSIDERATIONS

General Information Dispose of contents/container via a licensed disposal company and in accordance with local/regional/national regulations. Must not be disposed together with household garbage.

Special Precautions for Land Fill Contaminated packaging: Dispose of as unused product.

14. TRANSPORT INFORMATION

Land Transport (Australia)
ADG Code

Proper Shipping Name	Oxalic acid, dihydrate
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	Oxalic acid, dihydrate
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	Oxalic acid, dihydrate
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	Oxalic acid, dihydrate
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	Oxalic acid, dihydrate
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	Oxalic acid, dihydrate
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)	Schedule 6

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

Approval Code	HSR002503

National/Regional Inventories

Australia (AICS)	Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	205-634-3
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	OXACID1000, OXACID1001, OXACID1002, OXACID1003, OXACID1004, OXACID1005, OXACID1006, OXACID1007, OXACID1008, OXACID1009, OXACID1010, OXACID1011, OXACID1012, OXACID1013, OXACID1014, OXACID1015, OXACID1016, OXACID1017, OXACID1018, OXACID1019, OXACID1020, OXACID1021, OXACID1500, OXACID1501, OXACID1502, OXACID1503, OXACID1510, OXACID1515, OXACID1800, OXACID1801, OXACID1802, OXACID1803, OXACID2000, OXACID2001, OXACID2500, OXACID3000, OXACID3001, OXACID3500, OXACID4000, OXACID4500, OXACID5000, OXACID5001, OXACID5002, OXACID5003, OXACID5004, OXACID5005, OXACID5006, OXACID5007, OXACID5008, OXACID5009, OXACID5010, OXACID5011, OXACID5012, OXACID5013, OXACID5014, OXACID5015, OXACID5016, OXACID5017, OXACID5018, OXACID5019, OXACID5020, OXACID5021, OXACID5022, OXACID5023, OXACID5024, OXACID5025, OXACID5026, OXACID5027, OXACID5028, OXACID5029, OXACID5030, OXACID5031, OXACID5032, OXACID5033, OXACID5034, OXACID5035, OXACID5036, OXACID5037, OXACID5038, OXACID5039, OXACID5040, OXACID5500, OXACID6000, OXACID6001, OXACID6002, OXACID7000, OXACID8000, OXACID8200, OXACID8300, OXACID8350, OXACID8400, OXACID8450, OXACID8500, OXACID8501, OXACID8510, OXACID8599, OXACID8600, OXACID8601, OXACID8602, OXACID8700, OXACID8800, OXACID8815, OXACID8820, OXACID8850, OXACID8900, OXACID8925, OXACID9000, OXACID9500, OXACID9900
Revision	5
Revision Date	17 Jun 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