

1. IDENTIFICATION

Product Name	Ferrous sulphate, monohydrate
Other Names	Iron sulfate, monohydrate
Uses	Colcothar; Deodorizer; Soil conditioner; Forage; Fertilizer.
Chemical Family	No Data Available
Chemical Formula	FeSO ₄ .H ₂ O
Chemical Name	Sulfuric acid, iron(2+) salt (1:1), monohydrate
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 Acute Toxicity (Oral) - Category 4
Skin Corrosion/Irritation - Category 2
Serious Eye Damage/Irritation - Category 2A
Acute Hazard To The Aquatic Environment - Category 2

Pictograms

Signal Word Warning

Hazard Statements

H302	Harmful if swallowed.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H401	Toxic to aquatic life.

Precautionary Statements		Prevention	
		P280	Wear protective gloves/eye protection/face protection.
		Response	
		P273	Avoid release to the environment.
		P270	Do not eat, drink or smoke when using this product.
		P302 + P352	IF ON SKIN: Wash with plenty of soap and water.
		P337 + P313	If eye irritation persists: Get medical advice.
		P391	Collect spillage.
		P301 + P312	IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell.
		P330	Rinse mouth.
		P332 + P313	If skin irritation occurs: Get medical advice.
		P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
		P362 + P364	Take off contaminated clothing and wash it before reuse.
	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)

3. COMPOSITION/INFORMATION ON INGREDIENTS**Ingredients**

Chemical Entity	Formula	CAS Number	Proportion
Ferrous sulphate, monohydrate	FeSO4.H2O	17375-41-6	90 - 100 %
Contains: Manganese sulfate (as Mn)	H2O4S.Mn	7785-87-7	<1 %

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Contains: Sulfuric acid	H2O4S	7664-93-9	<1 %
Other impurities and stabilising additives	Unspecified	Unspecified	Balance %

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 if you feel unwell. 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. If eye irritation persists, get medical advice/attention.
Skin	IF ON SKIN: Wash with plenty of soap and water. 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. If respiratory symptoms persist, get medical advice/attention. Apply resuscitation if victim is not breathing. Administer oxygen if breathing is difficult.
Advice to Doctor	Treat symptomatically and supportively. Symptoms may be delayed.
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	Non-combustible. This product does not burn or support combustion.
Extinguishing Media	If material is involved in a fire, use extinguishing media appropriate to surrounding conditions.
Fire and Explosion Hazard	Decomposes on heating, emitting toxic fumes.
Hazardous Products of Combustion	Fire or heat will produce irritating and/or toxic gases, including Sulphur oxides, oxides of Iron.
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 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 dust formation. Avoid breathing dust and contact with eyes, skin and clothing.
Clean Up Procedures	Carefully shovel or sweep up spilled material and place in suitable container (see SECTION 13). Avoid dispersal of dust in the air.
Containment	Stop leak if safe to do so – Prevent entry into waterways, drains or confined areas.
Decontamination	After cleaning, flush away traces with water.

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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). Take precautionary measures against static discharge. Avoid release to the environment.
Storage	Store in a cool, dry and well-ventilated place, out of direct sunlight. Avoid storing in hot and humid conditions. Keep container tightly closed when not in use. Protect from moisture. Keep away from incompatible materials (see SECTION 10).
Container	Materials for containers/packaging: Acid-resistant materials are appropriate. Non-acid resistant metals are unsuitable (Iron, aluminium, etc).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

General	No value assigned for this specific material by Safe Work Australia. For Iron salts, soluble (as Fe): - Safe Work Australia Exposure Standard: TWA = 1 mg/m ³ - New Zealand Workplace Exposure Standard: TWA = 1 mg/m ³
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 when dust is generated. Recommended: Dust mask/particulate respirator (refer to AS/NZS 1715 & 1716). - Eye/face protection: Wear appropriate eye protection to avoid eye contact. Recommended: Chemical goggles. - Hand protection: Wear protective gloves. Recommended: Impervious gloves. - Skin/body protection: Wear appropriate personal protective clothing to avoid skin contact. Recommended: Protective apron; Boots; Overalls.
Special Hazards Precautions	Do not use this product if coated with brownish-yellow basic ferric sulphate!
Work Hygienic Practices	Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling. Take off contaminated clothing and wash before storage or reuse.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Powder or granules
Odour	Odourless
Colour	Greyish white
pH	3.0 - 5.0 (10% solution)
Vapour Pressure	No Data Available
Relative Vapour Density	No Data Available

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Boiling Point	Decomposes
Melting Point	No Data Available
Freezing Point	No Data Available
Solubility	Soluble in water (29.7 g/100 mL) 20°C
Specific Gravity	2.97
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	>=300 °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.
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. This product does not burn or support combustion.
Reactions That Release Gases or Vapours	Decomposes on heating emitting toxic fumes, including Sulphur oxides, oxides of Iron.
Release of Invisible Flammable Vapours and Gases	No information available.

10. STABILITY AND REACTIVITY

General Information	Gradual oxidation occurs in wet air, resulting in production of ferric sulfate, Fe(OH)SO ₄ .
Chemical Stability	Material is stable under normal conditions.
Conditions to Avoid	Avoid dust formation. Avoid exposure to air. Protect from moisture/humidity.
Materials to Avoid	Incompatible/reactive with alkalis, oxidising agents, fine metal powder, soluble carbonates.
Hazardous Decomposition Products	Decomposes on heating emitting toxic fumes, including Sulphur oxides, oxides of Iron.
Hazardous Polymerisation	Will not occur.

11. TOXICOLOGICAL INFORMATION**General Information**

- Acute toxicity: Harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea. Symptoms of swallowing large amounts of soluble iron compounds maybe delayed several hours and can include epigastric pain, vomiting blood and circulatory failure.
- Skin corrosion/irritation: Causes skin irritation due to strong acidity. Symptoms include redness.
- Eye damage/irritation: Causes serious eye irritation due to strong acidity. Symptoms include redness, pain, weeping.
- Respiratory/skin sensitisation: No sensitizing effects known.
- Germ cell mutagenicity: No biologically relevant genotoxic activity.
- Carcinogenicity: Not listed as a suspected/confirmed carcinogen by IARC, NTP.
- Reproductive toxicity: No information available.
- STOT (single exposure): Dust may cause respiratory irritation, coughing and shortness of breath.
- STOT (repeated exposure): Gastrointestinal disturbances, including colic, constipation and diarrhoea may occur in humans following the ingestion of iron sulfate. In children, ingestion of large quantities can cause vomiting (the vomit may contain blood), liver damage, rapid heart beat and peripheral vascular collapse.
- Aspiration toxicity: No information available.

Acute**Ingestion**

- Acute toxicity (Oral):
 - LD50, Rat: 319 mg/kg (Ferrous sulfate).

Carcinogen Category

None

12. ECOLOGICAL INFORMATION**Ecotoxicity**

- Aquatic toxicity:
 - LC50, Fish (various species): >0.41 - 28 mg/L (96 h) [Ferrous sulfate].
 - EC50, Crustacea (Daphnia magna): 1 - 10 mg/L (48 h) [Ferrous sulfate].

Persistence/Degradability

Not applicable for an inorganic compound.

Mobility

No information available.

Environmental Fate

Toxic to aquatic life - Prevent entry into drains and waterways.

Bioaccumulation Potential

Bioconcentration of iron to species is relatively low. Iron is an essential element for most living species and may be actively regulated in organisms.

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

Recycle containers after cleaning, or dispose properly under relevant regulations and local government standards.
 Remove residual content completely before disposing of empty containers.

14. TRANSPORT INFORMATION**Land Transport (Australia)**

ADG Code

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Proper Shipping Name	Ferrous sulphate, monohydrate
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	Ferrous sulphate, monohydrate
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 (Mexico)

Proper Shipping Name	Ferrous sulphate, monohydrate
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	Ferrous sulphate, monohydrate
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

SAFETY DATA SHEET FERROUS SULPHATE, MONOHYDRATE REVISION 4, DATE 23 MAR 21

Proper Shipping Name	Ferrous sulphate, monohydrate
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	Ferrous sulphate, monohydrate
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	Ferrous sulphate, monohydrate
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)
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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 Additives, Process Chemicals and Raw Materials (Subsidiary Hazard) Group Standard 2020 HSR002503

National/Regional Inventories

Australia (AIC)	Listed
Canada (DSL)	Not Determined
Canada (NDSL)	Not Determined
China (IECSC)	Not Determined
Europe (EINECS)	605-688-1
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 FESULP0013, FESULP0100, FESULP0200, FESULP0300, FESULP0400, FESULP0401, FESULP0402, FESULP0500, FESULP0501, FESULP0900, FESULP1000, FESULP1001, FESULP1002, FESULP1003, FESULP1004, FESULP1005, FESULP1006, FESULP1007, FESULP1008, FESULP1009, FESULP1010, FESULP1011, FESULP1012, FESULP1013, FESULP1014, FESULP1015, FESULP1016, FESULP1017, FESULP1018, FESULP1019, FESULP1020, FESULP1021, FESULP1022, FESULP1036, FESULP1037, FESULP1100, FESULP1200, FESULP2200, FESULP2300, FESULP2600, FESULP2700, FESULP2701, FESULP2710, FESULP2800, FESULP2801, FESULP2810, FESULP3000, FESULP3001, FESULP3002, FESULP3003, FESULP3004, FESULP3100, FESULP3101, FESULP3102, FESULP3103, FESULP3104, FESULP3200, FESULP3201, FESULP3300, FESULP3301, FESULP3400, FESULP3600, FESULP3601, FESULP3602, FESULP3603, FESULP3604, FESULP3605, FESULP3700, FESULP3701, FESULP3702, FESULP3703, FESULP3704, FESULP3705, FESULP3706, FESULP3710, FESULP3720, FESULP3800, FESULP3801, FESULP4000, FESULP4001, FESULP4200, FESULP4300, FESULP4301, FESULP4400, FESULP4700, FESULP5600, FESULP5601, FESULP5602, FESULP5700, FESULP5701, FESULP5800, FESULP5801, FESULP5802, FESULP5900, FESULP6300, FESULP6400, FESULP6401, FESULP6410, FESULP6420, FESULP6430, FESULP6601, FESULP6602, FESULP6603, FESULP6604, FESULP6700, FESULP6705, FESULP6710, FESULP6711, FESULP6715, FESULP6800, FESULP6801, FESULP6802, FESULP6803, FESULP6810, FESULP6825, FESULP6850, FESULP6851, FESULP6860, FESULP6900, FESULP7100, FESULP7200, FESULP7300, FESULP7600, FESULP7601, FESULP7602, FESULP7700, FESULP7800, FESULP8500, FESULP8501, FESULP9200

Revision 4

SAFETY DATA SHEET FERROUS SULPHATE, MONOHYDRATE REVISION 4, DATE 23 MAR 21

Revision Date	23 Mar 2021
Reason for Issue	SDS updated
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 Fahrenheit 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. LC ₅₀ 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. LD ₅₀ 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 Health 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