1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Product Name	**MANGANESE SULPHATE MONOHYDRATE**
Other Names	Manganese Sulphate Manganous(Ii) Sulphate, Hydrate; Manganese Sulphate Monohydrate
Uses	Fertilisers, feed additive, paints and varnishes, ceramics, textile dyes, medicines, fungicides, ore flotation, catalyst in viscose process, synthetic manganese dioxide, pharmaceutical applications.
Chemical Family	No Data Available
Chemical Formula	$MnSO_4.H_2O$
Chemical Name	Manganese Sulphate Monohydrate
Product Description	No Data Available

Contact Information	**Australia**	**Location**	**Telephone**	**Ask For**
	Rural Liquid Fertilisers Pty Ltd	61 Dowd Street Welshpool WA 6106	+61 1800 753 000	Technical Officer

2. HAZARDS IDENTIFICATION

ADG Code	Non-Dangerous Goods according to the criteria of the Australian Dangerous Goods Code (ADG Code).	
ASCC Hazardous Classification	Hazardous according to the criteria of ASCC [NOHSC:1008(2004)]	
Categories	Xn	Harmful
	N	Dangerous For The Environment
Risk Phrases	R48/20/22	Harmful : danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
	R51/53	Toxic to aquatic organisms; may cause long term adverse effects in the aquatic environment.
Safety Phrases	S22	Do not breathe dust.
	S36	Wear suitable protective clothing.
	S51	Use only in well ventilated areas.
	S53	Avoid exposure - obtain special instructions before use.
	S61	Avoid release to the environment. Refer to special instructions/Material Safety Data Sheets.
HSNO Hazard Classification	6.1D; 6.9A; 9.1B; 9.3C	
Poisons Schedule (Aust)	No Data Available	

3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredients

Chemical Entity	Formula	CAS Number	Proportion
Manganese (Ii) Sulfate Monohydrate	**No Data Available**	**10034-96-5**	**>98.0 %**

4. FIRST AID MEASURES

Description of necessary measures according to routes of exposure:

Swallowed	Rinse mouth with water. If swallowed, give a glass of water to drink. If vomiting occurs give further water. Never give anything by mouth to an unconscious person. Seek medical assistance.
Eyes	Immediately flush eyes with water for at least 15 minutes while holding eyelids open. In all cases of eye contamination, its is a sensible precaution to seek medical advice.
Skin	Immediately remove all contaminated clothing and shoes. Flush skin and hair with running water (and soap if available). Seek medical attention in the event of irritation.
Inhaled	Remove victim from exposure to fresh air - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm and at rest. If patient finds breathing difficult, and develops a bluish discolouration of the skin, ensure airways are clear, and have qualified person give oxygen through a face mask. Seek immediate medical advice.
Advice to Doctor	Treat symptomatically based on judgement of doctor and individual reactions of patient.
Medical Conditions Aggravated by Exposure	Chronic: Chronic inhalation or ingestion may result in manganism characterized by neurological symptoms such as headache, apathy, and weakness of the legs, followed by psychosis and neurological symptoms similar to those of Parkinson's disease. In its acute form, manganese poisoning has an effect characteristic of other heavy metals, leading to "metal fume fever" if dust or fume is inhaled in sufficient quantity. An airborne concentration thought to be immediately dangerous to life or health is in the order of 10,000 mg/m^3 (as Manganese). May impair fertility. Other chronic effects from inhaling high amounts of manganese include an increased incidence of cough and bronchitis and susceptibility to infectious lung disease. Long Term Effects: Available evidence from animal studies indicate that repeated or prolonged exposure to this material could result in effects on the lungs, and central nervous system. Repeated inhalation may cause chronic bronchitis.

5. FIRE FIGHTING MEASURES

Flammability Conditions	Product is a non-flammable solid.
Extinguishing Media	If material is involved in a fire use Fine water spray, normal foam, dry agent (carbon dioxide, dry chemical powder).
Hazardous Products of Combustion	Non-combustible solid. Incompatible with strong oxidising agents, strong acids, powdered metals, hydrogen peroxide, and sources of ignition. When involved in a fire, this product may generate carbon dioxide, sulphur oxide and sulphur dioxide, and oxides of manganese.
Personal Protective Equipment	Fire fighters should wear a positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots and gloves) or chemical splash suit. Clear fire area of all non-emergency personnel. Stay upwind. Keep out of low areas. Eliminate ignition sources. Move fire exposed containers from fire area if it can be done without risk. Do NOT allow fire fighting water to reach waterways, drains or sewers. Store fire fighting water for treatment.
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

Personnel involved in the clean up should wear full protective clothing as listed in section 8. Avoid accidents, clean up immediately. Evacuate all unnecessary personnel. Increase ventilation. Avoid walking through spilled product as it is slippery when spilt. Stop leak if safe to do so. Isolate the danger area. Do NOT let product reach drains or waterways. If product does enter a waterway, advise the Environmental Protection Authority or your local Waste Management. Use clean, non-sparking tools and equipment. Shut off all possible sources of ignition.

Clean Up Procedures

Contain and sweep/shovel up spills with dust binding material or use an industrial vacuum cleaner. Water may be used to prevent dusting. Transfer to a suitable, labelled container and dispose of promptly as hazardous waste. Wash area down with excess water.

7. HANDLING AND STORAGE

Handling

Ensure an eye bath and safety shower are available and ready for use. Observe good personal hygiene practices and recommended procedures. Wash thoroughly after handling. Take precautionary measures against static discharges by bonding and grounding equipment. Avoid contact with eyes, skin and clothing. Do not inhale product vapours. Avoid prolonged or repeated exposure. Remove contaminated clothing and wash before reuse.

Storage

Store in a cool, dry, well-ventilated area. Keep containers tightly closed when not in use. Inspect regularly for deficiencies such as damage or leaks. Protect against physical damage. Store away from incompatible materials as listed in section 10. Protect from direct sunlight and heat. This product has a UN classification of 3077 and a Dangerous Goods Class 9 (Miscellaneous) according to The Australian Code for the Transport of Dangerous Goods By Road and Rail.

NOTE: This product is subject to special provision AU01 according to The ADG7.

SP No. AU01 Environmentally Hazardous Substances meeting the descriptions of UN 3077 or UN 3082 are not subject to this Code when transported by road or rail in; (a) packagings; (b) IBCs; or (c) any other receptacle not exceeding 500 kg(L).

Container

Container type/packaging must comply with all applicable local legislation. Store in original packaging as approved by manufacturer.

8. EXPOSURE CONTROLS / PROTECTION

General

The following exposure standard has been established by The Australian Safety and Compensation Council (ASCC); Manganese, dust & compounds (as Mn): 8hr TWA = 1 mg/m3

NOTE: The exposure value at the TWA is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. These exposure standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

Exposure Limits

No Data Available

Biological Limits

No information available on biological limit values for this product.

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. Long-term exposure at or below 0.5 to 1 mg/m^3 should afford protection for those individuals who may be susceptible to the neurological effects of prolonged exposure to manganese. Accordingly, the Exposure Standards Working Group recommends an eight-hour TWA exposure standard of 1 mg/m^3 for manganese and inorganic compounds. Although there is acknowledgement that the particle size distribution, type of manganese compound & oxidation state may play an important role in the development of both the neurological and respiratory effects of manganese, there is insufficient evidence to distinguish confidently between manganese fume, dust and other inorganic manganese compounds. For this reason it is recommended that a single exposure standard be applied for all inorganic manganese compounds, measured as inspirable dust (as Mn).

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid
Appearance	Crystalline Powder
Odour	Odourless
Colour	Grey/Pink
pH	3 - 3.5
Vapour Pressure	No Data Available
Relative Vapour Density	No Data Available
Boiling/Melting Point	850 (Decomposes) °C
Solubility	Soluble in water °C
Freezing Point	700 °C
Specific Gravity	2.95
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	850 °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	No Data Available
Potential for Dust Explosion	No Data Available
Fast or Intensely Burning Characteristics	No Data Available
Flame Propagation or Burning Rate of Solid Materials	No Data Available
Non-Flammables That Could Contribute Unusual Hazards to a Fire	No Data Available
Properties That May Initiate or Contribute to Fire Intensity	No Data Available
Reactions That Release Gases or Vapours	No Data Available
Release of Invisible Flammable Vapours and Gases	No Data Available

10. STABILITY AND REACTIVITY

Chemical Stability	Product is stable under normal conditions of use, storage and temperature. Material loses all water at 400 - 450 deg C.
Conditions to Avoid	Avoid excessive heat, direct sunlight, generating dust, moisture, confined spaces.
Materials to Avoid	Incompatible with strong oxidising agents, strong acids, powdered metals, hydrogen peroxide, and sources of ignition.
Hazardous Decomposition Products	When involved in a fire, this product may generate carbon dioxide, sulphur oxide and sulphur dioxide, and oxides of manganese.
Hazardous Polymerisation	Hazardous polymerisation will not occur. May react violently with hydrogen peroxide. Manganese sulphate can react with strong acids, strong oxidising agents and powdered metals.

11. TOXICOLOGICAL INFORMATION

General Information	Oral LD50 Rat : 2150mg/Kg Oral LD50 Mouse : 2330mg/Kg
Eye Irritant	May be an eye irritant. Exposure to the dust may cause discomfort due to particulate nature. May cause physical irritation to the eyes.
Ingestion	Harmful: danger of serious damage to health by prolonged exposure if swallowed. Swallowing can result in nausea, vomiting, diarrhoea, and abdominal pain. A side effect of oral manganese administration is an increase in losses of calcium in the faeces and a subsequent lowering of calcium blood levels.
Inhalation	Material may be irritant to the mucous membranes of the respiratory tract (airways). Harmful: danger of serious damage to health by prolonged exposure through inhalation.
Skin Irritant	Contact with skin may result in irritation.
Carcinogen Category	0

12. ECOLOGICAL INFORMATION

Ecotoxicity	Toxic to aquatic organisms. May cause long term adverse effects in the aquatic environment.
Persistence/Degradability	No information available on persistence/degradability for this product.
Mobility	No information available on mobility for this product. Soluble in water
Environmental Fate	Do NOT let product reach waterways, drains and sewers.
Bioaccumulation Potential	No information available on bioaccumulation for this product.
Environmental Impact	No Data Available

13. DISPOSAL CONSIDERATIONS

General Information	Dispose of in accordance with all local, state and federal regulations. All empty packaging should be disposed of in accordance with Local, State, and Federal Regulations or recycled/reconditioned at an approved facility.
Special Precautions for Land Fill	Contact a specialist disposal company or the local waste regulator for advice.

14. TRANSPORT INFORMATION

ADG Code	Non-Dangerous Goods according to the criteria of the Australian Dangerous Goods Code (ADG Code).
Air	
IATA	
Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Manganese Sulphate Monohydrate)
Class	9 Miscllaneous Dangerous Goods and Articles
Subsidiary Risk(s)	No Data Available
UN Number	3077
Hazchem	2Z
Pack Group	III
Special Provision	No Data Available
Land	
Australia: ADG Code	
Proper Shipping Name	MANGANESE SULPHATE, MONOHYDRATE
Class	No Data Available
Subsidiary Risk(s)	No Data Available
EPG	No Data Available
UN Number	No Data Available
Hazchem	No Data Available
Pack Group	No Data Available
Special Provision	SPAU01
New Zealand: NZS5433	
Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Manganese Sulphate Monohydrate)
Class	9 Miscllaneous Dangerous Goods and Articles
Subsidiary Risk(s)	No Data Available
EPG	47 Low To Moderate Hazard Substances
UN Number	3077
Hazchem	2Z
Pack Group	III
Special Provision	No Data Available

Sea	
IMDG	
Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Manganese Sulphate Monohydrate)
Class	9 Miscllaneous Dangerous Goods and Articles
Subsidiary Risk(s)	No Data Available
UN Number	3077
Hazchem	2Z
Pack Group	III
Special Provision	No Data Available
EMS	FA,SF
Marine Pollutant	Yes

15. REGULATORY INFORMATION

General Information	No Data Available
EPA (New Zealand)	**Hazardous Substances and New Organisms Act (HSNO)** Approval Code: HSR004019
Poisons Schedule (Aust)	No Data Available
AICS Name	SULFURIC ACID, MANGANESE(2+) SALT (1:1) MONOHYDRATE

16. OTHER INFORMATION

Key/Legend		
	<	Less Than
	>	Greater Than
	AICS	Australian Inventory of Chemical Substances
	atm	Atmosphere
	CAS	Chemical Abstracts Service (Registry Number)
	cm^2	Square Centimetres
	CO_2	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
	inH_2O	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
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
mmH_2O	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
torr	Millimetre of Mercury
TWA	Time Weighted Average
ug/24H	Micrograms per 24 Hours
UN	United Nations
wt	Weight

Disclaimer

This document has been prepared by Rural Liquid Fertilisers (RLF), and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue.

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Revision: 1
SDS Date: 04 October 2017
End of SDS