

### 1. IDENTIFICATION

<b>Product Name</b>	<b>Manganese Sulphate</b>
<b>Other Names</b>	Manganese sulfate, monohydrate; Manganese sulphate [CAS#7785-87-7]; Sulfuric acid, manganese(2+) salt (1:1), monohydrate
<b>Uses</b>	Feed additive, fertiliser, manufacturing other chemicals, textile dyeing, ceramics, mineral flotation.
<b>Chemical Family</b>	No Data Available
<b>Chemical Formula</b>	MnSO4.H2O
<b>Chemical Name</b>	Manganese sulphate, monohydrate
<b>Product Description</b>	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

<b>Hazard Classification</b>	Hazardous according to the criteria of the Globally Harmonised System of Classification and Labelling of Chemicals (GHS)		
<b>Hazard Categories</b>	Acute Toxicity (Oral) - Category 5 Specific Target Organ Toxicity (Repeated Exposure) - Category 2 Acute Hazard To The Aquatic Environment - Category 2 Long-term Hazard To The Aquatic Environment - Category 2		
<b>Pictograms</b>	 		
<b>Signal Word</b>	Warning		
<b>Hazard Statements</b>	<b>H303</b>	May be harmful if swallowed.	
	<b>H373</b>	May cause damage to organs through prolonged or repeated exposure.	
	<b>H411</b>	Toxic to aquatic life with long lasting effects.	
<b>Precautionary Statements</b>	Prevention	<b>P260</b>	Do not breathe dusts or mists.
		<b>P273</b>	Avoid release to the environment.
	Response	<b>P391</b>	Collect spillage.
		<b>P301 + P312</b>	IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
		<b>P314</b>	Get medical advice/attention if you feel unwell.
	Disposal	<b>P501</b>	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

<b>HSNO Classifications</b>	Health Hazards	<b>6.1D</b>	Substances that are acutely toxic - Harmful
		<b>6.9B</b>	Substances that are harmful to human target organs or systems
	Environmental Hazards	<b>9.1B</b>	Substances that are ecotoxic in the aquatic environment

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

*Ingredients*

Chemical Entity	Formula	CAS Number	Proportion
Manganese sulphate, monohydrate	MnSO4.H2O	10034-96-5	>=98 - 100 %

**4. FIRST AID MEASURES**

**Description of necessary measures according to routes of exposure**

<b>Swallowed</b>	IF SWALLOWED: Rinse mouth, then drink plenty of water. Do not induce vomiting. Get medical advice/attention if you feel unwell. Never give anything by mouth to an unconscious person.
<b>Eye</b>	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.
<b>Skin</b>	IF ON SKIN: Remove and isolate contaminated clothing and shoes. Immediately wash skin with plenty of soap and running water. If skin irritation occurs, get medical advice/attention. Wash contaminated clothing and shoes before reuse.
<b>Inhaled</b>	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention if respiratory symptoms persist or if you feel unwell. Apply resuscitation if victim is not breathing. Administer oxygen if breathing is difficult.
<b>Advice to Doctor</b>	Get medical advice/attention if you feel unwell. 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.
<b>Medical Conditions Aggravated by Exposure</b>	No information available.

**5. FIRE FIGHTING MEASURES**

<b>General Measures</b>	If safe to do so, move undamaged containers from fire area. Cool containers with water spray until well after fire is out.
<b>Flammability Conditions</b>	Non-combustible; Material does not burn.
<b>Extinguishing Media</b>	If material is involved in a fire, use dry chemical, Carbon dioxide (CO2), foam or water spray for extinction. Use fire fighting measures that suit the surrounding fire.
<b>Fire and Explosion Hazard</b>	Decomposes on heating, emitting toxic fumes.
<b>Hazardous Products of Combustion</b>	Fire or heat may produce irritating, toxic and/or corrosive fumes, including Manganese oxides, Sulphur oxides.
<b>Special Fire Fighting Instructions</b>	Contain runoff from fire control or dilution water - Runoff may pollute waterways.
<b>Personal Protective Equipment</b>	Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters protective clothing will provide thermal protection but provides only limited chemical protection.
<b>Flash Point</b>	No Data Available
<b>Lower Explosion Limit</b>	No Data Available
<b>Upper Explosion Limit</b>	No Data Available
<b>Auto Ignition Temperature</b>	No Data Available
<b>Hazchem Code</b>	No Data Available

**6. ACCIDENTAL RELEASE MEASURES**

<b>General Response Procedure</b>	Ensure adequate ventilation. Do not touch or walk through spilled material - Slippery when spilt. Avoid accidents, clean up immediately! Avoid dust formation. Avoid breathing dust and contact with eyes, skin and clothing.
<b>Clean Up Procedures</b>	Sweep up and shovel into suitable containers for disposal, reuse or recycling (see SECTION 13).
<b>Containment</b>	Stop leak if safe to do so - Prevent entry into waterways, drains or confined areas.
<b>Decontamination</b>	No information available.
<b>Environmental Precautionary Measures</b>	Spillages and decontamination runoff should be prevented from entering drains and watercourses. If contamination of sewers or waterways has occurred advise local emergency services.
<b>Evacuation Criteria</b>	Spill or leak area should be isolated immediately. Keep unauthorised personnel away. Keep upwind and to higher ground.
<b>Personal Precautionary Measures</b>	Use personal protective equipment as required (see SECTION 8).

**7. HANDLING AND STORAGE**

<b>Handling</b>	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 prolonged or repeated exposure. Avoid dust formation. Do not breathe dust and avoid contact with eyes, skin and clothing. Do not ingest. Use personal protective equipment as required (see SECTION 8). Keep away from heat and sources of ignition - No smoking. Take precautionary measures against static discharges. Avoid release to the environment - Collect spillage (see SECTION 6).
<b>Storage</b>	Store in a cool, dry and well-ventilated place, out of direct sunlight. Keep container tightly closed when not in use - check regularly for spills. Protect from moisture. Keep away from heat and sources of ignition - No smoking. Keep away from food/feedstuffs and incompatible materials (see SECTION 10).
<b>Container</b>	Keep in the original container.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

<b>General</b>	No specific exposure standards are available for this product. For Manganese, dust & compounds: - Safe Work Australia Exposure Standard: TWA = 1 mg/m <sup>3</sup> (as Mn). - New Zealand WES (2018) for Manganese fume, dust and compounds (as Mn): TWA = 0.2 mg/m <sup>3</sup> ; TWA = 0.02 mg/m <sup>3</sup> (respirable dust). - NIOSH REL for Manganese compounds and fume (as Mn): TWA = 1 mg/m <sup>3</sup> ; STEL = 3 mg/m <sup>3</sup> . - OSHA PEL for Manganese compounds and fume (as Mn): 5 mg/m <sup>3</sup> Ceiling. - Immediately dangerous to life or health (IDLH) concentration: 500 mg/m <sup>3</sup> (as Mn). *Emergency limits (Manganese sulphate): TEEL-1: 9.2 mg/m <sup>3</sup> ; TEEL-2: 15 mg/m <sup>3</sup> ; TEEL-3: 90 mg/m <sup>3</sup> .
<b>Exposure Limits</b>	No Data Available
<b>Biological Limits</b>	No information available.
<b>Engineering Measures</b>	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.
<b>Personal Protection Equipment</b>	- Respiratory protection: Wear respiratory protection in case of inadequate ventilation or an inhalation risk exists. Recommended: Type P1 dust respirator. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used (refer to AS/NZS 1715 & 1716). - Eye/face protection: Wear appropriate eye protection to avoid eye contact. Recommended: Face shield, chemical goggles or safety glasses with side shield protection, as appropriate. - Hand protection: Handle with gloves. Recommended: Wear gloves of impervious material. Final choice of appropriate glove type will vary according to individual circumstances. This can include methods of handling, and engineering controls as determined by appropriate risk assessments. - Skin/body protection: Wear appropriate personal protective clothing to avoid skin contact. Recommended: Clean clothing or protective clothing should be worn, preferably with an apron. Safety boots in industrial situations is advisory.
<b>Special Hazards Precautions</b>	No information available.
<b>Work Hygienic Practices</b>	Do not eat, drink or smoke when using this product. Always wash hands before smoking, eating or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using. Store protective clothing separately.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Physical State</b>	Solid
<b>Appearance</b>	Powder or granules
<b>Odour</b>	Odourless
<b>Colour</b>	Pink
<b>pH</b>	3 - 3.5 50 g/L (20°C)
<b>Vapour Pressure</b>	No Data Available
<b>Relative Vapour Density</b>	No Data Available
<b>Boiling Point</b>	850 °C
<b>Melting Point</b>	700 °C (anhydrous)
<b>Freezing Point</b>	No Data Available

<b>Solubility</b>	Soluble in water
<b>Specific Gravity</b>	No Data Available
<b>Flash Point</b>	No Data Available
<b>Auto Ignition Temp</b>	No Data Available
<b>Evaporation Rate</b>	No Data Available
<b>Bulk Density</b>	No Data Available
<b>Corrosion Rate</b>	No Data Available
<b>Decomposition Temperature</b>	No Data Available
<b>Density</b>	2.95 g/cm <sup>3</sup>
<b>Specific Heat</b>	No Data Available
<b>Molecular Weight</b>	169.02 g/mol
<b>Net Propellant Weight</b>	No Data Available
<b>Octanol Water Coefficient</b>	No Data Available
<b>Particle Size</b>	No Data Available
<b>Partition Coefficient</b>	No Data Available
<b>Saturated Vapour Concentration</b>	No Data Available
<b>Vapour Temperature</b>	No Data Available
<b>Viscosity</b>	No Data Available
<b>Volatile Percent</b>	No Data Available
<b>VOC Volume</b>	No Data Available
<b>Additional Characteristics</b>	Hygroscopic.
<b>Potential for Dust Explosion</b>	No information available.
<b>Fast or Intensely Burning Characteristics</b>	No information available.
<b>Flame Propagation or Burning Rate of Solid Materials</b>	No information available.
<b>Non-Flammables That Could Contribute Unusual Hazards to a Fire</b>	No information available.
<b>Properties That May Initiate or Contribute to Fire Intensity</b>	Non-combustible; Material does not burn.
<b>Reactions That Release Gases or Vapours</b>	Decomposes on heating, emitting toxic fumes, including Manganese oxides, Sulphur oxides.
<b>Release of Invisible Flammable Vapours and Gases</b>	No information available.

## 10. STABILITY AND REACTIVITY

<b>General Information</b>	No information available.
<b>Chemical Stability</b>	Material is stable under normal conditions.
<b>Conditions to Avoid</b>	Avoid dust formation. Protect from moisture. Avoid high temperatures.
<b>Materials to Avoid</b>	Incompatible/reactive with strong oxidising agents, strong acids; Aluminium, magnesium, powdered metals.
<b>Hazardous Decomposition Products</b>	No decomposition when used as directed. Decomposes on heating, emitting toxic fumes, including Manganese oxides, Sulphur oxides.
<b>Hazardous Polymerisation</b>	Will not occur.

## 11. TOXICOLOGICAL INFORMATION

<b>General Information</b>	- Acute toxicity: May be harmful if swallowed. Ingestion may irritate the gastric tract causing nausea, abdominal pain, diarrhoea, lethargy, vomiting and possible coma. Inorganic manganese salts are poorly absorbed through the
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intestines, but may produce hypoglycemia and decreased calcium blood levels should absorption occur.

- Skin corrosion/irritation: May cause skin irritation.
- Eye damage/irritation: May cause eye irritation. Exposure to the dust may cause discomfort due to particulate nature. May cause physical irritation to the eyes.
- Respiratory/skin sensitisation: No information available.
- Germ cell mutagenicity: Not considered to be genotoxic.
- Carcinogenicity: Not considered to be carcinogenic.
- Reproductive toxicity: Not considered likely to have reproductive or developmental toxicity.
- STOT (single exposure): Inhalation of dust may cause acute irritation to the mucous membrane and upper airways. Symptoms of exposure can include coughing, sneezing with possible nose bleeds, breathing difficulties, and increase the incidence of upper respiratory tract infections (i.e. pneumonia). Absorptions of inorganic manganese salts through the lungs is poor but may occur in chronic poisoning. May cause 24- to 28-hour flu-like illness (metal fume fever) characterised by chills, fever, aching muscles, dryness in the mouth and throat and headache.
- STOT (repeated exposure): May cause damage to organs through prolonged or repeated exposure. Chronic manganese poisoning (excessive inhalation and ingestion exposure) can result in symptoms including inflammation of the respiratory tract, frequent nose bleeds, headaches, sluggishness, sleepiness, dermatitis, irritability and liver enlargement followed by progressive deterioration of the central nervous system. In severe cases, the illness closely resembles Parkinson's Disease with symptoms including weakness of the legs, increased muscle tension, hand tremor, slurred speech, muscle cramps, spastic gait, mental deterioration, emotional/sexual disturbances, uncontrollable laughter, various blood changes, and manganese psychosis (loss of contact with reality). High incidence of pneumonia has been found in workers exposed to the dust or fume of some manganese compounds. Individuals exposed to dusts and fumes of manganese have been reported to suffer from a much higher incidence of upper respiratory infections and pneumonia than does the general population.
- Aspiration toxicity: No information available.

**Acute**

**Ingestion**

Acute toxicity (Oral):  
 - LD50, Rat: 2,150 mg/kg bw. (anhydrous substance).

**Carcinogen Category**

None

**12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

Aquatic toxicity:  
 - LC50, Fish (Fathead minnow): 30.6 mg/L (96 h) [anhydrous].  
 - EC50, Invertebrates (Daphnia magna): 8.3 mg/L (48 h) [anhydrous].

**Persistence/Degradability**

No information available.

**Mobility**

The product is soluble in water.

**Environmental Fate**

Toxic to aquatic life with long lasting effects - Avoid release to the environment.

**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.

**Special Precautions for Land Fill**

Contaminated packaging: Since emptied containers may retain product residues, follow label warnings even after container is emptied.

**14. TRANSPORT INFORMATION**

**Land Transport (Australia)**

ADG Code

**Proper Shipping Name**

Manganese sulphate, monohydrate

**Class**

No Data Available

<b>Subsidiary Risk(s)</b>	No Data Available
<b>EPG</b>	47 Low To Moderate Hazard Substances
<b>UN Number</b>	No Data Available
<b>Hazchem</b>	No Data Available
<b>Pack Group</b>	No Data Available
<b>Special Provision</b>	AU01
<b>Comments</b>	Not regulated as DG when transported by road or rail in packagings that do not incorporate a receptacle exceeding 500 kg(L) or IBCs.

**Land Transport (Malaysia)**

ADR Code

<b>Proper Shipping Name</b>	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Manganese sulphate, monohydrate)
<b>Class</b>	9 Miscellaneous Dangerous Goods and Articles
<b>Subsidiary Risk(s)</b>	No Data Available
<b>EPG</b>	47 Low To Moderate Hazard Substances
<b>UN Number</b>	3077
<b>Hazchem</b>	2Z
<b>Pack Group</b>	III
<b>Special Provision</b>	No Data Available

**Land Transport (New Zealand)**

NZS5433

<b>Proper Shipping Name</b>	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Manganese sulphate, monohydrate)
<b>Class</b>	9 Miscellaneous Dangerous Goods and Articles
<b>Subsidiary Risk(s)</b>	No Data Available
<b>EPG</b>	47 Low To Moderate Hazard Substances
<b>UN Number</b>	3077
<b>Hazchem</b>	2Z
<b>Pack Group</b>	III
<b>Special Provision</b>	No Data Available

**Land Transport (United States of America)**

US DOT

<b>Proper Shipping Name</b>	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Manganese sulphate, monohydrate)
<b>Class</b>	9 Miscellaneous Dangerous Goods and Articles
<b>Subsidiary Risk(s)</b>	No Data Available
<b>ERG</b>	171 Substances (Low to Moderate Hazard)
<b>UN Number</b>	3077
<b>Hazchem</b>	2Z
<b>Pack Group</b>	III
<b>Special Provision</b>	No Data Available

**Sea Transport**

IMDG Code

<b>Proper Shipping Name</b>	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Manganese sulphate, monohydrate)
<b>Class</b>	9 Miscellaneous Dangerous Goods and Articles
<b>Subsidiary Risk(s)</b>	No Data Available
<b>UN Number</b>	3077
<b>Hazchem</b>	2Z
<b>Pack Group</b>	III

**Special Provision** No Data Available  
**EMS** F-A, S-F  
**Marine Pollutant** Yes

**Air Transport**  
 IATA DGR

**Proper Shipping Name** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Manganese sulphate, monohydrate)  
**Class** 9 Miscellaneous Dangerous Goods and Articles  
**Subsidiary Risk(s)** No Data Available  
**UN Number** 3077  
**Hazchem** 2Z  
**Pack Group** III  
**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** 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  
 HSR004019 (Revoked)

**National/Regional Inventories**

**Australia (AICS)** Listed  
**Canada (DSL)** Not Determined  
**Canada (NDSL)** Not Determined  
**China (IECSC)** Not Determined  
**Europe (EINECS)** 232-089-9  
**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

MANSUL0100, MANSUL0400, MANSUL0500, MANSUL0800, MANSUL1000, MANSUL1001, MANSUL1002, MANSUL1003, MANSUL1004, MANSUL1005, MANSUL1006, MANSUL1007, MANSUL1008, MANSUL1009, MANSUL1010, MANSUL1011, MANSUL1012, MANSUL1013, MANSUL1014, MANSUL1015, MANSUL1016, MANSUL1017, MANSUL1018, MANSUL1019, MANSUL1020, MANSUL1021, MANSUL1022, MANSUL1023, MANSUL1024, MANSUL1025, MANSUL1026, MANSUL1027, MANSUL1028, MANSUL1100, MANSUL1200, MANSUL1201, MANSUL1300, MANSUL1301, MANSUL1400, MANSUL1500, MANSUL1600, MANSUL1605, MANSUL1610, MANSUL1615, MANSUL1620, MANSUL1700, MANSUL1800, MANSUL1801, MANSUL1802, MANSUL1803, MANSUL1804, MANSUL1805, MANSUL1806, MANSUL1807, MANSUL1808, MANSUL1809, MANSUL1810, MANSUL1811, MANSUL1812, MANSUL1813, MANSUL1814, MANSUL1815, MANSUL1816, MANSUL1817, MANSUL1818, MANSUL1819, MANSUL1820, MANSUL1821, MANSUL1822, MANSUL1823, MANSUL1824, MANSUL1825, MANSUL1826, MANSUL1850, MANSUL1855, MANSUL1900, MANSUL1950, MANSUL2000, MANSUL2001, MANSUL2100, MANSUL2200, MANSUL2300, MANSUL2301, MANSUL2400, MANSUL2500, MANSUL2501, MANSUL2502, MANSUL2600, MANSUL2601, MANSUL2602, MANSUL2603, MANSUL2604, MANSUL2605, MANSUL2606, MANSUL2607, MANSUL2608, MANSUL2609, MANSUL2610, MANSUL2611, MANSUL2612, MANSUL2613, MANSUL2614, MANSUL2700, MANSUL2800, MANSUL3000, MANSUL3001, MANSUL3002, MANSUL3003, MANSUL3004, MANSUL3100, MANSUL3101, MANSUL3102, MANSUL3103, MANSUL3104, MANSUL3105, MANSUL3106, MANSUL3107, MANSUL3108, MANSUL3109, MANSUL3110, MANSUL3111, MANSUL3112, MANSUL3113, MANSUL3114, MANSUL3115, MANSUL3116, MANSUL3117, MANSUL3118, MANSUL3119, MANSUL3120, MANSUL3121, MANSUL3122, MANSUL3123, MANSUL3124, MANSUL3125, MANSUL3126, MANSUL3127, MANSUL3128, MANSUL3129, MANSUL3130, MANSUL3131, MANSUL3132, MANSUL3133, MANSUL3134, MANSUL3135, MANSUL3136, MANSUL3137, MANSUL3138, MANSUL3139, MANSUL3140, MANSUL3141, MANSUL3142, MANSUL3200, MANSUL3201, MANSUL3202, MANSUL3300, MANSUL3301, MANSUL3400, MANSUL3500, MANSUL3501, MANSUL3502, MANSUL3503, MANSUL3600, MANSUL3600, MANSUL3700, MANSUL3800, MANSUL4000, MANSUL4001, MANSUL4002, MANSUL4003, MANSUL4100, MANSUL4200, MANSUL4300, MANSUL4400, MANSUL4500, MANSUL4501, MANSUL4600, MANSUL4650, MANSUL4660, MANSUL4661, MANSUL4700, MANSUL4750, MANSUL4751, MANSUL4752, MANSUL4800, MANSUL4900, MANSUL5000, MANSUL5001, MANSUL5002, MANSUL5003, MANSUL5100, MANSUL5300, MANSUL5301, MANSUL5302, MANSUL5305, MANSUL5500, MANSUL5501, MANSUL5502, MANSUL5503, MANSUL5600, MANSUL5700, MANSUL5800, MANSUL5900, MANSUL6000, MANSUL6001, MANSUL6100, MANSUL6300, MANSUL6400, MANSUL6500, MANSUL6501, MANSUL6502, MANSUL6550, MANSUL6551, MANSUL6570, MANSUL6571, MANSUL6600, MANSUL6601, MANSUL6605, MANSUL6700, MANSUL6800, MANSUL7000, MANSUL7001, MANSUL7500, MANSUL7900, MANSUL8000, MANSUL8001, MANSUL8002, MANSUL8003, MANSUL8004, MANSUL8005, MANSUL8006, MANSUL8007, MANSUL8008, MANSUL8009, MANSUL8010, MANSUL8011, MANSUL8012, MANSUL8013, MANSUL8050, MANSUL8051, MANSUL8055, MANSUL8060, MANSUL8070, MANSUL8071, MANSUL8072, MANSUL8075, MANSUL8076, MANSUL8080, MANSUL8081, MANSUL8082, MANSUL8083, MANSUL8084, MANSUL8086, MANSUL8087, MANSUL8088, MANSUL8089, MANSUL8090, MANSUL8091, MANSUL8092, MANSUL8093, MANSUL8098, MANSUL8100, MANSUL8105, MANSUL8800, MANSUL8850, MANSUL8851, MANSUL8860, MANSUL9000, MANSUL9001, MANSUL9002, MANSUL9003, MANSUL9004, MANSUL9010, MANSUL9011, MANSUL9012, MANSUL9013, MANSUL9100, MANSUL9300, MANSUL9400, MANSUL9500, MANSUL9501, MANSUL9502, MANSUL9600, MANSUL9601, MANSUL9602, MANSUL9700, MANSUL9701, MANSUL9702, MANSUL9800, MANSUL9900, MANSUP1000, MANSUP4100, MANSUP6200, MANSUP6201, MANSUP6202

### Revision

4

### Revision Date

01 Mar 2019

### Key/Legend

&lt; Less Than

&gt; Greater Than

**AICS** Australian Inventory of Chemical Substances**atm** Atmosphere**CAS** Chemical Abstracts Service (Registry Number)**cm<sup>2</sup>** Square Centimetres**CO<sub>2</sub>** 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/cm<sup>3</sup>** 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 insoluble in each other.  
**inHg** Inch of Mercury  
**inH<sub>2</sub>O** Inch of Water  
**K** Kelvin  
**kg** Kilogram  
**kg/m<sup>3</sup>** 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<sup>3</sup>** Cubic Metre  
**mbar** Millibar  
**mg** Milligram  
**mg/24H** Milligrams per 24 Hours  
**mg/kg** Milligrams per Kilogram  
**mg/m<sup>3</sup>** Milligrams per Cubic Metre  
**Misc** or **Miscible** Liquids form one homogeneous liquid phase regardless of the amount of either component present.  
**mm** Millimetre  
**mmH<sub>2</sub>O** 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