

Safety Data Sheet

Manganese Sulphate Monohydrate

acc. to OSHA HCS (29CFR 1910.1200) and WHMIS 2015 regulations

Document owner: **MMC Laboratory**

Effective Date:
02/08/2003

Revision Date:
23/02/2024

Revision No:
3

Trade Name: Manganese Sulphate Monohydrate

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1. Product identifier

Trade name: Manganese Sulphate Monohydrate

CAS Number: 10034-96-5

Other means of identification:

Manganese Sulphate

Manganous sulphate Monohydrate

MnSO₄

1.2. Recommended use and restrictions

Recommended Use:

Raw materials.

Industrial uses.

Restrictions on use:

No relevant information available.

1.3. Details of the supplier of the Safety Data Sheet

Manufacturer/Supplier name: MANGANESE METAL COMPANY

Address: PO Box 323, Nelspruit, South Africa, 1200

Telephone: (+2713) 759 4600

Fax: (+2713) 752 7657

Email: morne.ruiters@mmc.co.za

Website: <http://www.mmc.co.za>

1.4. Emergency telephone number(s)

Emergency (013) 759 4600

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Swallowing or absorption through the skin can cause acute or chronic damage to health. All contact with the human body must be avoided.

2.2. Label elements

GHS label elements

The substance is classified and labelled according to the Globally Harmonized System (GHS).

Signal word: Warning.

Hazard pictograms:

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Hazard statements:

May be harmful if swallowed.

May cause damage to organs through prolonged or repeated exposure.

Toxic to aquatic life with long lasting effects.

Precautionary statements:

Do not breathe dust/fume/gas/mist/vapours/spray

All contact with the human body must be avoided

Avoid release to the environment

2.3. Other hazards

There are no other hazards not otherwise classified that have been identified.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	CAS number	EC number	Content
MANGANESE Sulphate	10034-96-5	232-089-9	>98

4. FIRST AID MEASURES

4.1. Description of first aid measures

After inhalation:

Supply fresh air; consult doctor in case of complaints.

Provide oxygen treatment if affected person has difficulty breathing and seek medical attention.

After skin contact:

Brush off loose particles/dried crystals from skin.

Wash with soap and water.

If skin irritation is experienced, consult a doctor.

After eye contact:

Remove contact lenses if worn.

Rinse opened eye for several minutes under running water or diphoterine. If symptoms persist, consult a doctor.

After swallowing:

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Rinse out mouth with water or diphoterine and then drink plenty of water.
Do not induce vomiting; immediately call for medical help.

4.2. Most important symptoms and effects, both acute and delayed:

Coughing
Breathing difficulty
Slight irritant effect on eyes.
Gastric or intestinal disorders when ingested. Nausea in case of ingestion.

4.3. Indication of any immediate medical attention and special treatment needed:

No relevant information available.

First Aid Facilities:

Eye wash facilities and Safety shower should be available.

5. FIREFIGHTING MEASURES

5.1. Extinguishing media

Dry sand
Dry chemical powder
Limestone powder
Use any extinguishing agent suitable for the surrounding fire

For safety reasons unsuitable extinguishing agents:

Water jet

5.2. Special hazards arising from the substance or mixture

Non-Combustible.
May evolve manganese and Sulphur oxides when heated to decomposition.

5.3. Advice for firefighters

Treat as per requirements for surrounding fires. Evacuate area and contact emergency services. Remain upwind and notify those downwind of hazard. Wear full protective equipment including Self Contained Breathing Apparatus (SCBA) when combating fire. Use water fog to cool intact containers and nearby storage areas.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation.
Use personal protective equipment as required. Avoid contact with skin, eyes and clothes. Do not breathe the dust.

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6.2. Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose Methods and material for containment and cleaning up Pick up mechanically.

6.3. Methods and material for containment and cleaning up

Advice on how to contain a spill

Covering of drains.
Take up mechanically.

Advice on how to clean up a spill

Take up mechanically. Control of dust.

Other information relating to spills and releases

Place in appropriate containers for disposal.

6.4. Reference to other sections

See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7. HANDLING AND STORAGE

7.1. Handling

Precautions for safe handling:

Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas. Use only in well ventilated areas.

7.2. Conditions for safe storage, including any incompatibilities

Storage

Requirements to be met by storerooms and receptacles:

Avoid storage near extreme heat, ignition sources or open flame.
Keep in closed container.

Information about storage in one common storage facility:

Store away from foodstuffs. Observe good personal hygiene, including washing hands before eating. Prohibit eating, drinking and smoking in contaminated areas. Store away from oxidizing agents

Further information about storage conditions:

Keep containers tightly sealed.

7.3. Specific end use(s)

No relevant information available.

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8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

8.1. Control parameters

Components with limit values that require monitoring at the workplace:

The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit. At this time, the remaining constituents have no known exposure limits.

7439-96-5 manganese

PEL (USA)	Ceiling limit value: 5 mg/m ³ as Mn
REL (USA)	Short-term value: 3 mg/m ³ Long-term value: 1 mg/m ³ fume, as Mn
TLV (USA)	Long-term value: 0.02* 0.1* mg/m ³ as Mn; *respirable **inhalable fraction
EL (Canada)	Long-term value: 0.2 mg/m ³ as Mn; R
EV (Canada)	Long-term value: 0.2 mg/m ³ as manganese
LMPE (Mexico)	Long-term value: 0.2 mg/m ³ Mn

8.2. Exposure controls

Personal protective equipment:

General protective and hygienic measures:

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Wash hands before breaks and at the end of work.

Do not inhale dust / smoke / mist.

Avoid contact with the eyes.

Avoid close or long-term contact with the skin.

Engineering controls:

Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended. Maintain dust levels below the recommended exposure standard

Breathing equipment:

Where an inhalation risk exists, wear a Class P1 (Particulate) respirator. At high dust levels, wear a Full-face Class P3 (Particulate) respirator.

For spills, respiratory protection may be advisable.

Protection of hands:

Wear PVC rubber gloves.

Eye protection: Wear dust proof goggles.

Body protection: Wear drill overall.

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Limitation and supervision of exposure into the environment No special requirements.

Risk management measures No special requirements.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance:	
Form:	Solid
Colour:	Pale-Pink Powder or granules
Odor:	odourless
Odor Threshold	Not determined.
pH-value:	2 to 5
Melting point/Melting range:	Approximately >449 °C (>840 °F)
Boiling point/Boiling range:	Approximately 371 °C (7000 °F)
Flash point:	Not applicable.
Flammability (solid, gaseous):	Not applicable.
Auto-ignition temperature:	Not applicable.
Decomposition temperature:	449 °C (840°F)
Danger of explosion:	Not applicable.
Explosion limits	
Lower:	Not applicable.
Upper:	Not applicable.
Oxidizing properties:	Non-oxidizing
Vapor pressure at 955 °C (1751 °F):	Not applicable
Density:	
Relative density:	1.2 to 1.6, depending on concentration
Vapor density:	Not applicable.
Evaporation rate:	Not applicable.
Solubility in / Miscibility with Water:	Fully soluble.
Partition coefficient (n-octanol/water):	Not applicable.
Viscosity	
Dynamic:	Not determined.
Kinematic:	Not determined.
Other information	No relevant information available.

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10. STABILITY AND REACTIVITY

10.1. Reactivity

This material is not reactive under normal ambient conditions.

10.2. Chemical Stability

Stable under recommended conditions of use storage and storage.

10.3. Possibility of hazardous reactions

Strong oxidizing agents might convert Mn to higher oxidation states such as permanganate.
Reaction with strong alkali will precipitate Mn as hydroxides.

10.4. Conditions to avoid

Avoid heat, sparks, open flames and other ignition sources.

10.5. Incompatible materials

Incompatible with strong oxidizers (e.g. hypochlorite), acids (e.g. nitric acid).

10.6. Hazardous decomposition products

May evolve manganese oxides when heated to decomposition. May evolve sulphur oxides when heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity:

LD/LC50 values that are relevant for classification:

7439-96-5 manganese

Ora LD50 9000 mg/kg (rat)

Primary irritant effect:

On the skin: Contact may result in irritation, rash, and dermatitis.

On the eye: Contact may result in irritation, lacrimation, pain and redness.

Sensitization: Based on available data, the classification criteria are not met.

IARC (International Agency for Research on Cancer):

Substance is not listed.

NTP (National Toxicology Program):

Substance is not listed.

OSHA-Ca (Occupational Safety & Health Administration):

Substance is not listed.

Probable route(s) of exposure:

Ingestion. Inhalation. Eye contact. Skin contact.

Repeated dose toxicity: Long term inhalation of product dust may be harmful.

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CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)

Germ cell mutagenicity: Based on available data, the classification criteria are not met.

Carcinogenicity: Based on available data, the classification criteria are not met.

Reproductive toxicity: Based on available data, the classification criteria are not met.

STOT-single exposure: Over exposure may result in irritation of the nose and throat, with coughing.

STOT-repeated exposure: Repeated exposure to manganese may result in manganese poisoning (manganism), a progressively disabling brain disease, which in its latter stages resembles Parkinsons disease. Symptoms may result in lack of appetite, fatigue and changes in speech, balance and personality.

Aspiration hazard: Based on available data, the classification criteria are not met.

12. ECOLOGICAL INFORMATION

12.1. Toxicity

Aquatic toxicity:

Manganese and its compounds have moderate acute and chronic toxicity to aquatic life. Insufficient data are available to evaluate or predict the short-term and long-term effects of manganese and its compounds on plants, birds, or land animals. Most plants have a very high tolerance for manganese. Toxic to aquatic life with long lasting effects.

12.2. Persistence and degradability

Manganese is an essential element for all living organisms including animals, plants and bacteria.

12.3. Bio accumulative potential:

Not expected to bioaccumulate.

12.4. Mobility in soil:

Soluble manganese 2+ compounds are relatively mobile and may potentially leach into surface and groundwater. Soluble in water.

12.5. Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

12.6. Other adverse effects

Manganese may exist in the environment as the more soluble (2+) form and/or the less soluble (3+) form. In acidic waters, high levels of dissolved manganese may occur. Occurs naturally (0.085% of earth's crust). LC50 (Fathead minnow) is 30.6 mg/L/96 hours; EC50 (Daphnia magna) is 8.3 mg/L/48 hours.

13. DISPOSAL CONSIDERATIONS

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13.1. Waste treatment methods:

Convert to insoluble form by dissolving in water and precipitating with lime or sodium carbonate. Absorb with sand or similar and dispose of to an approved landfill site. Insoluble salts: Dispose of to an approved landfill or waste processing site.

13.2. Relevant provisions relating to waste:

This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

13.3. Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.

14. TRANSPORT INFORMATION

CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE



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	Land Transport (ADG)	SEA Transport (IMGD/IMO)	Air Transport (IATA/ICAO)
14.1 UN Number	3077	3077	3077
14.2 UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S (contains manganese sulphate monohydrate)		
14.3 Transport hazard classes	9	9	9
14.4 Packing group	111	111	111

14.5 Environmental Hazards

Can pollute water and air.
Hazardous to aquatic environment

14.6 Special precautions for user

Hazchem Code 2Z
GTEPG 9C1
EMS F-A, S-F

14.7. Maritime transport in bulk according to IMO instruments

The cargo is not intended to be carried in bulk.

14.8. Information for each of the UN Model Regulations

Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN) - Additional information

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
Particulars in the transport document	UN3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., (Manganese (II) sulphate monohydrate), 9, III, (-)
Classification code	M7
Danger label(s)	9, "Fish and tree"
Environmental hazards	yes (hazardous to the aquatic environment)
Special provisions (SP)	274, 335, 375, 601
Excepted quantities (EQ)	E1

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Limited quantities (LQ) 5 kg
 Transport category (TC) 3
 Tunnel restriction code (TRC) -
 Hazard identification No 90
 Emergency Action Code 2Z

International Maritime Dangerous Goods Code (IMDG) - Additional information

Proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
 Particulars in the shipper's declaration UN3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., (Manganese(II) sulphate monohydrate), 9, III
 Marine pollutant yes (hazardous to the aquatic environment), (Manganese(II) sulphate monohydrate)
 Danger label(s) 9, "Fish and tree"
 Special provisions (SP) 274, 335, 966, 967, 969
 Excepted quantities (EQ) E1
 Limited quantities (LQ) 5 kg
 EmS F-A, S-F
 Storage category A

International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information

Proper shipping name Environmentally hazardous substance, solid, n.o.s.
 Particulars in the shipper's declaration UN3077, Environmentally hazardous substance, solid, n.o.s., (Manganese(II) sulphate monohydrate), 9, III
 Environmental hazards yes (hazardous to the aquatic environment)
 Danger label(s) 9, "Fish and tree"
 Special provisions (SP) A97, A158, A179, A197, A215
 Excepted quantities (EQ) E1
 Limited quantities (LQ) 30 kg

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15 REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Poison schedule

A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications Safe work

SDS is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

Inventory listing(s)

No information

15.2 Chemical safety assessment

No information provided.

16 OTHER INFORMATION

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Date of preparation / last revision 01/08/2003 / - 23 February 2024

Additional information: none

Respirators

In general, the use of respirators should be limited and engineering controls employed to avoid exposure. If respiratory equipment must be worn ensure correct respirator selection and training is undertaken. Remember that some respirators may be extremely uncomfortable when used for long periods. The use of air powered or air supplied respirators should be considered where prolonged or repeated use is necessary.

Health effects from exposure

It should be noted that the effects from exposure to this product will depend on several factors including: form of product; frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

Personal protective equipment guidelines

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as form of product, method of application, working environment, quantity used, product

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concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

Abbreviations

ACGIH-American Conference of Governmental Industrial Hygienists

CAS # Chemical Abstract Service number - used to uniquely identify chemical compounds CNS Central Nervous System

EC No - European Community Number

GHS -Globally Harmonized System

GTEPG -Group Text Emergency Procedure Guide

IARC -International Agency for Research on Cancer

LC50 -Lethal Concentration, 50% / Median Lethal Concentration

LD50- Lethal Dose, 50% / Median Lethal Dose

mg/m³ -Milligrams per Cubic Metre

OEL- Occupational Exposure Limit

pH -relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).

ppm -Parts Per Million

STEL -Short-Term Exposure Limit

STOT-RE Specific target organ toxicity (repeated exposure)

STOT-SE Specific target organ toxicity (single exposure)

SUSMP- Standard for the Uniform Scheduling of Medicines and Poisons

SWA- Safe Work Australia

TLV -Threshold Limit Value

TWA- Time Weighted Average

Sources

Website, European Chemicals Agency (echa.europa.eu)

Website, US EPA Substance Registry Services (ofmpub.epa.gov/sorinternet/registry/substreg/home/overview/home.do)

Website, Chemical Abstracts Registry, American Chemical Society (www.cas.org) Patty's Industrial Hygiene, 6th ed., Rose, Vernon, ed. ISBN: 978-0-470-07488-6

Casarett and Doull's Toxicology: The Basic Science of Poisons, 8th Ed., Klaasen, Curtis D., ed., ISBN: 978-0-07-176923-5.

Safety Data Sheets, Individual Manufacturers

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SDS PREPARED BY:
MANGANESE METAL COMPANY
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1200
TEL NUMBER (013) 7594600
WEBSITE: WWW.MMC.CO.ZA

17 AMENDMENT HISTORY

The following information documents the last changes

Date	Revised by	Changes
26 August 2020	Twice Mnisi, Paul Savage	Changed MMC logo and the document format. Minor changes to the content of the document were made.
10 May 2023	Twice Mnisi	Handling and storage Exposure control and protection, physical and chemical protection, Stability, transport information, and Regulatory information
23 February 2024	Twice Mnisi	Done changes on; Firefighting measures, Composition and information on ingredients, Transport information.